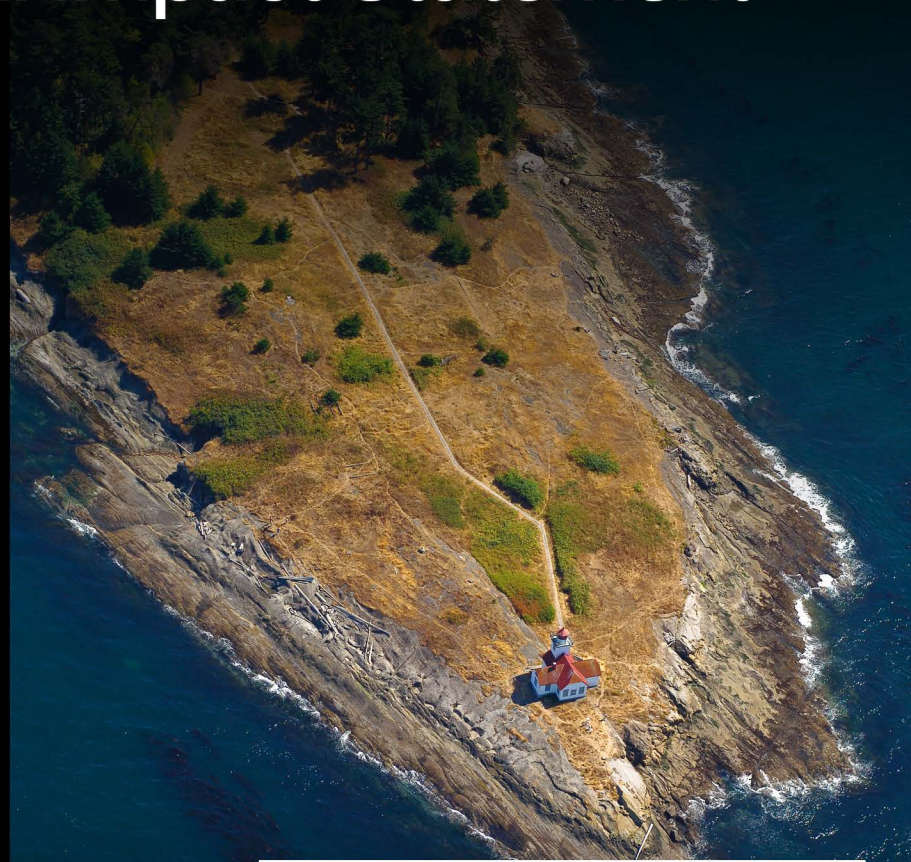
2018

San Juan Islands National Monument Draft Resource Management Plan and Environmental Impact Statement



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United States Department of the Interior
Bureau of Land Management

Draft Resource Management Plan and Environmental Impact Statement for the San Juan Islands National Monument

September 2018

Cooperating Agencies:

City of Anacortes, WA
National Park Service, San Juan Island National Historical Park
Port Gamble S'Klallam Tribe
Samish Indian Nation
San Juan County
Skokomish Indian Tribe
State of Washington
Stillaguamish Tribe of Indians
Town of Friday Harbor, WA
Tulalip Tribes of Washington
U.S. Coast Guard
U.S. Fish and Wildlife Service
U.S. Navy, Naval Air Station Whidbey Island

Abstract: The Draft San Juan Islands National Monument Resource Management Plan and Environmental Impact Statement (Draft RMP/EIS) describes and evaluates a range of potential management approaches for approximately 1,000 acres of Bureau of Land Management (BLM) administered land in the San Juan Islands. The BLM prepared this document in coordination with cooperating agencies and consulting tribes and with input from the Monument Advisory Committee and the public. No RMP currently addresses these lands.

The purpose of this planning effort is to protect the cultural and ecological values for which the Monument was designated, to ensure that tribal rights are respected, and to address the growing demand for recreational use of the Monument. The BLM analyzed four action alternatives, one sub-alternative, and a No Action Alternative. Under the No Action Alternative, the Monument would continue to lack an RMP and the BLM's current custodial management would continue.

Comments on the Draft RMP/EIS are due within 90 days of publication of the EPA Notice of Availability in the Federal Register. The BLM will announce the close of the comment period in news releases, newsletters, and on the San Juan Islands National Monument RMP website at https://go.usa.gov/xRphc.

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United States Department of the Interior

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In reply refer to:
1610 (ORW000)
San Juan Islands National Monument Resource Management Plan

Dear Reader:

The Draft San Juan Islands National Monument Resource Management Plan and Environmental Impact Statement (Draft RMP/EIS) for the Oregon/Washington Bureau of Land Management's (BLM) Spokane District is now available for review. The BLM prepared this document in coordination with cooperating agencies and consulting tribes and with input from the Monument Advisory Committee and the public. The BLM is undertaking this planning process in accordance with Presidential Proclamation 8947; the National Environmental Policy Act of 1969, as amended; the Federal Land Policy and Management Act of 1976, as amended; implementing regulations; the BLM's Land Use Planning Handbook (H-1601-1); and other applicable laws and policies.

This planning process will determine the long-term management of the San Juan Islands National Monument, which encompasses approximately 1,000 acres[1] of BLM-administered lands in the San Juan Islands. No RMP currently addresses these lands. The Draft RMP/EIS describes and evaluates a range of potential management approaches for the Monument. The Draft RMP/EIS and supporting information is available at https://go.usa.gov/xRphc.

Chapter 1 of the Draft RMP/EIS describes the purpose and need for the planning effort and the BLM-administered land that the BLM will manage under the new RMP. Chapter 2 describes the range of approaches the BLM is considering for managing the Monument. Chapter 3 describes the effects of the RMP alternatives on resources and values. Chapter 4 describes the public involvement and collaboration that occurred during the preparation of this Draft RMP/EIS. That collaboration includes engagement with cooperating agencies and government-to-government relationships with tribes. This chapter also includes a list of BLM staff involved in the planning effort.

You will have 90 days to provide written comments on the San Juan Islands National Monument Draft RMP/EIS; we encourage you to review it and provide feedback. Comments pertaining to the alternatives and analysis would be most helpful to ensuring that the range of alternatives is adequate and the analysis is credible to the extent they do the following:

- Present new information relevant to the analysis
- Present reasonable alternatives, other than those already included in the Draft RMP/EIS
- Make suggestions, with a reasonable basis, for the development of a Proposed RMP

[1] This includes approximately 189 acres withdrawn to the U.S. Coast Guard that the BLM currently co-manages but does not administer. The U.S. Coast Guard is in the process of relinquishing these withdrawals.

- Question, with reasonable basis, the adequacy of, method for, or assumptions used in the analysis
- Question, with reasons, the accuracy of information contained in the Draft RMP/EIS

The BLM is required to provide written responses to comments that meet one or more of the above criteria. The BLM is not required to provide written responses to comments that simply vote on an alternative or state support or opposition to BLM policies or proposals without providing reasons.

The BLM has a variety of structured comment forms that members of the public may use to provide input. Members of the public may also provide comments without the aid of a comment form. Comments may be submitted in a variety of ways:

Email: blm_or_sanjuanislandsnm@blm.gov

Mail:
San Juan Islands National Monument Comments
Lopez Island BLM Office
PO Box 3
Lopez, WA 98261

Hand delivery to:
San Juan Islands National Monument
BLM Lopez Island Office
37 Washburn Place
Lopez Island, WA 98261

or

Spokane District BLM Office
N Fancher Rd
Spokane Valley, WA 99212

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, know that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

The BLM will hold a series of public meetings to provide information on the Draft RMP/EIS, respond to questions, and receive public comments. The BLM will announce all public meetings at least 15 days in advance on the RMP website and through announcements to the local media.

The BLM has sent copies of the Draft RMP/EIS to affected Tribal, Federal, State, and local government agencies. Copies of the Draft RMP/EIS are available for review at public libraries throughout the planning area, as well as at the BLM office on Lopez Island (37 Washburn Place, Lopez Island, WA) and in Spokane (1103 N Fancher Rd, Spokane Valley, WA).

Thank you for your continued interest in the San Juan Islands National Monument planning process. We appreciate the information and suggestions you contribute to the planning process.

Sincerely,

Linda Clark
District Manager

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Executive Summary

Background and Introduction

On March 25, 2013, President Obama signed Presidential Proclamation 8947 designating the San Juan Islands National Monument (Monument). The Monument consists of 1,021 acres of land scattered across the San Juan Islands, which lie in the heart of the Salish Sea. This acreage includes approximately 842 acres currently under BLM jurisdiction and approximately 189 acres withdrawn to the U.S. Coast Guard (i.e., currently under Coast Guard jurisdiction). The U.S. Coast Guard is in the process of relinquishing these withdrawals. The BLM anticipates that all 189 acres will come under BLM administration prior to the publication of the record of decision for this planning process.

The BLM prepared this Draft Resource Management Plan/Draft Environmental Impact Statement (Draft RMP/EIS) with input from consulting tribes, cooperating agencies, the Monument Advisory Committee, and the public. The Draft RMP/EIS was prepared in accordance with Proclamation 8947; the Federal Land Policy and Management Act (FLPMA) of 1976; 43 CFR 1610; and with guidance from the BLM's Land Use Planning Handbook (BLM 2005). The Draft RMP/EIS provides the overarching objectives and direction for the Monument, as well as identifying prohibited and allowable uses of Monument lands.

What is the purpose and need for this Draft RMP?

The "purpose and need" is a formal statement developed for each BLM planning effort. It describes the BLM's purpose and need for action. In this case, the BLM's need is to develop an RMP for the Monument. The purpose of this planning effort is to protect the cultural and ecological values for which the Monument was designated, to ensure that tribal treaty rights are respected, and to address the growing demand for recreational use of the Monument.

The need for this RMP arises from the BLM's requirement to develop RMPs that provide for the use of public lands under the FLPMA. The need is also established by Proclamation 8947, which directs the BLM to ''prepare and maintain a management plan for the monument."

Why is the BLM developing an Environmental Impact Statement for this RMP?

The National Environmental Policy Act requires that the BLM prepare an EIS for all actions that significantly affect the quality of the human environment. The BLM planning regulations define the approval of an RMP as a major Federal action significantly affecting the quality of the human environment. These regulations also require that the BLM undertake the environmental analysis of alternatives as part of the RMP process and, wherever possible, publish these components as part of a single document. Therefore, the BLM presents this Draft RMP integrated with the Draft EIS.

What types of coordination did the BLM undertake during Draft RMP/EIS Development?

Public Involvement

The BLM published the Notice of Intent to prepare the RMP in the Federal Register on March 2, 2015. The Notice of Intent began a 30-day initial scoping for commenting on issues and planning criteria. In addition to publishing the Notice of Intent, the BLM distributed press releases and sent numerous letters and emails to potentially interested individuals, organizations, and agencies. The BLM also held five public scoping meetings across the Monument.

The BLM further solicited input on human uses (i.e., recreation) and travel management (i.e., road and trail networks) during the winter and spring of 2016. During that time, the BLM held four workshops and one Monument Advisory Committee meeting. The BLM used this input to develop recreation management area frameworks and a draft travel and transportation plan (see appendices H and O in the Draft RMP/EIS).

The BLM also emailed multiple newsletters to interested parties during Draft RMP/EIS development.

Monument Advisory Committee

Proclamation 8947 required that the BLM "establish an advisory committee under the Federal Advisory Committee Act (5 USC App.) to provide information and advice regarding the development [an RMP]." The Monument Advisory Committee is composed of twelve members representing a variety of interests. The Secretary of the Interior appoints committee members for two year terms.

During the development of the Draft RMP/EIS, the Monument Advisory Committee met with the BLM multiple times to provide input on the Monument's values, human uses of the Monument, and on public involvement methods and opportunities. The BLM announces all committee meetings in advance. These meetings are open to the public and include a public comment period.

Government-to-Government Consultation

The BLM consulted with twelve federally recognized Native American tribes known to have interests in the Monument. This consultation identified areas of mutual interest and concern, as well as helped the BLM consider the potential effects of Federal undertakings and actions on tribal rights and interests.

As part of government-to-government consultation, the BLM notified potentially interested tribes prior to the start of the public scoping period. Additionally, the BLM solicited input from and met with tribal governments throughout the planning process, providing numerous input and review opportunities on the Draft RMP/EIS.

The twelve federally recognized Native American tribes the BLM is consulting with on this effort are:

- Jamestown S'Klallam Tribe
- Lower Elwha Tribe
- Lummi Nation
- Nooksack Tribe
- Port Gamble S'Klallam Tribe
- Samish Indian Nation
- Skokomish Indian Tribe
- Stillaguamish Tribe of Indians
- Suquamish Tribe
- Swinomish Indian Tribal Community
- Tulalip Tribes of Washington
- Upper Skagit Tribe

Cooperating Agencies

In April of 2015, the BLM invited agencies with jurisdiction by law and/or special expertise to participate as cooperating agencies in the planning process. A cooperating agency is a Tribal, Federal, State, or local government agency with jurisdiction by law or special expertise that assists a lead Federal agency in developing an environmental assessment or environmental impact statement. Thirteen Tribal, Federal, State, and local agencies responded and developed unique memorandums of understanding to aid in development of this RMP. Throughout the planning process, the BLM solicited input from and met with cooperators to discuss specific issues and analysis. The BLM also held resource-specific conference calls with sub-sets of the cooperating agency group.

The thirteen cooperating agencies associated with this effort are:

- City of Anacortes
- National Park Service, San Juan Island National Historical Park
- Port Gamble S'Klallam Tribe
- Samish Indian Nation
- San Juan County
- Skokomish Indian Tribe
- State of Washington
- Stillaguamish Tribe of Indians
- Town of Friday Harbor
- Tulalip Tribes of Washington
- U.S. Coast Guard
- U.S. Fish and Wildlife Service
- U.S. Navy, Naval Air Station Whidbey Island

Regulatory Agency Consultation

Section 7(a)(2) of the Endangered Species Act requires the BLM to consult with the U.S. Fish and Wildlife Service (U.S. FWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service on the effects of the Proposed RMP on species listed as threatened or endangered. While there are no listed species that regularly use habitat within the Monument, there are a variety of listed species for which the Monument could provide habitat through reintroduction or population expansion or that occupy habitat adjacent to the Monument (see the Wildlife Section of Chapter 3 beginning on page 247). In addition, the National Historic Preservation Act requires the BLM to consult with the Washington State Historic Preservation Officer and with the appropriate Tribal Historic Preservation Officers on actions that could affect historic properties. The BLM will complete consultation prior to issuing a Record of Decision.

What Management Approaches is the BLM Analyzing in this Draft?

The BLM developed a range of approaches (alternatives) for managing Monument resources using input from the public, the Monument Advisory Committee, cooperating agencies, consulting tribes, and BLM resource specialists.

In Chapter 2 of the Draft RMP/EIS, the BLM considers a No Action Alternative (i.e., continuation of current management), four action alternatives (alternatives A, B, C, and D), and a sub-alternative[2] (Sub-Alternative C). The BLM designed these alternatives to meet the purpose and need, to meet direction in Proclamation 8947 and the FLPMA, and to address the planning issues identified during scoping and other outreach.

The alternatives (summarized below) detail potential objectives, management tools, and allowable uses in the Monument. Table 1**,** below, summarizes substantial numerical differences between the alternatives (e.g., acres to which different visual resource management classes would apply under each alternative).

No Action Alternative

Monument lands are not now, and have never been, covered by an RMP. Therefore, under the No Action Alternative, custodial management would continue with no plan-level objectives and few prohibited uses applying to the Monument. Custodial management of the Monument would continue to focus on meeting legal and policy mandates and preventing unnecessary and undue degradation. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of National Environmental Policy Act analysis and ensuring that actions are consistent with Proclamation 8947 and the FLMPA.

With no RMP in place to guide or restrict human uses, Monument lands would remain generally open to recreation (including hiking, equestrian use, camping, hunting, and trail-based bicycle use) though existing laws and regulations would continue to apply. The one exception would continue to be the area of critical environmental concern (ACEC) designation that applies to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay[3]. The 1990 ACEC decisions, which prohibit camping and require permits for organized groups of 10 or more, would continue to apply to these areas.

Common to all Action Alternatives

Under all alternatives, the BLM would manage vegetation as necessary to maintain the current diversity of plant communities and wildlife. It would protect cultural resources from damage due to natural and human causes. The BLM would facilitate public use of the Monument for educational, scientific, cultural, and spiritual uses. It would collaboratively engage with tribal partners to facilitate traditional

[2] A sub-alternative alters discrete aspects of an alternative to allow the BLM to isolate and analyze the effect of making small changes.

[3] See Appendix D of the Draft RMP/EIS for specifics of current ACEC management.

activities and the exercise of treaty rights and seek opportunities for co-stewardship and collaboration within the Monument. Under all alternatives, the BLM could use a variety of methods—including fencing and undertaking temporary closures—as needed to protect the cultural and ecological objects and values for which the Monument was designated and sensitive tribal activities.

During plan implementation, the BLM would develop vegetation treatments, among other implementation-level actions, to meet the plan objectives. The locations, sizes, and management tools used (within the range of tools allowed under each alternative) would be determined during the implementation-level planning and National Environmental Policy Act compliance processes.

Alternative A

Under Alternative A, the BLM would allow natural processes to take place without management intervention to the extent possible while protecting the cultural and ecological objects and values for which the Monument was designated. It would facilitate this by restricting human uses of the Monument to the greatest extent possible. To this end, the BLM would facilitate use of the Monument for authorized educational, scientific, cultural, and spiritual activities, but not for recreation. The BLM would allow mechanical, manual, and biological control treatments to achieve objectives, but would prohibit the use of prescribed burning and chemical treatments (e.g., herbicides). Within maritime heritage areas (i.e., the land surrounding light stations and associated structures), the BLM would manage to prevent deterioration of historic structures from their current condition.

Alternative B

Under Alternative B, the BLM would focus on promoting ecological resistance and resilience by enhancing plant communities that are relatively scarce within the San Juan Islands. The BLM would allow mechanical, manual, biological control, chemical, and fire treatments to achieve objectives. Recreational opportunities would include hiking, hunting, designated site and dispersed camping, and opportunities for solitude and quiet, which would be provided by expanding the trail network, requiring permits to access 167 acres of the Monument, and providing dispersed camping by permit. No trail-based equestrian or bicycling opportunities would be available under this alternative. Current hunting activities (firearm and non-firearm based) would be likely to continue[4]. Within maritime heritage areas, the BLM would restore historic structures and prohibit the construction of new structures or the rebuilding of previously existing structures.

Alternative C

Under Alternative C, the BLM would restore plant communities to a state approximating pre-European settlement. It would focus on managing for vegetation conditions brought about by the use of fire on the landscape by Coast Salish peoples. The BLM would allow mechanical, manual, biological control, chemical, and fire treatments to achieve objectives. Recreational opportunities would include hiking, equestrian use, and designated site camping. No dispersed camping or trail-based bicycling opportunities would be available under this alternative. In areas where members of the public have identified conflict between firearm-based hunting and other recreational uses, the BLM would prohibit the discharge of firearms except for half of firearm-based hunting seasons[5]. Within maritime heritage areas, the BLM would restore historic structures, allow the rebuilding of previously existing structures, and prohibit the construction of new structures.

[4] BLM-administered lands where firearm discharge is not prohibited would continue to be open to this use, though may be subject to temporary closures for emergencies and public health and safety concerns.

[5] Firearm prohibitions would not affect non-firearm-based hunting (e.g., bow hunting) or use by tribal members for the purposes of hunting.

Sub-Alternative C

Sub-Alternative C is identical to Alternative C with two exceptions. First, the BLM would prohibit chemical treatments (e.g., herbicides). Second, it would prohibit the discharge of firearms throughout the Monument[5].

Alternative D

Under Alternative D, the BLM would focus on expanding and enhancing visitor experiences, while meeting the protective mandate of Proclamation 8947. It would maintain the current extent and condition of plant communities throughout the life of the plan. The BLM would allow mechanical, manual, biological control, chemical, and fire treatments to achieve objectives. Recreational opportunities would include hunting and increased camping and hiking, equestrian use, and biking on an expanded trail network. Current hunting activities (firearm and non-firearm based) would be likely to continue. Within maritime heritage areas, the BLM would restore historic structures and allow the rebuilding of previously existing structures and the building of new structures to support education and interpretation.

What is the BLM's Preferred Alternative?

Alternative B (described above) is the BLM preferred alternative. Regulation (43 CFR 1610) requires the BLM to identify a preferred alternative in the Draft RMP/EIS. It is simply the BLM's starting point for gaining public feedback to use in developing the Proposed RMP.

In developing a Proposed RMP, the BLM will consider making modifications to the preferred alternative in response to public comments; advice from consulting tribes, cooperating agencies, and the Monument Advisory Committee; and BLM priorities. The Proposed RMP may be a modification of the design of Alternative B, a modification of the design of a different alternative analyzed in the Draft RMP/EIS, a new alternative developed from within the spectrum of alternatives analyzed in the Draft RMP/EIS, or an alternative analyzed in the Draft RMP/EIS as written.

The identification of the preferred alternative is not a commitment or decision. The BLM will develop a Proposed RMP after the end of the public comment period on the Draft RMP/EIS.

What are the Effects of the Alternatives Analyzed in this Draft?

The effects analysis is a description of the potential for significant impacts on the human environment from the alternatives, as well as of impacts from the alternatives that are pertinent to the purpose and need for the RMP. The Council on Environmental Quality regulations for implementing the National Environmental Policy Act state that the human environment is the natural and physical environment and the relationship of people to that environment (40 CFR 1508.14).

Chapter 3 (Affected Environment and Effects Analysis) describes the existing resource conditions and trends in the Monument. It also describes and the varying direct, indirect, and cumulative effects of the alternatives. This includes descriptions of the environmental, social, and economic consequences that the BLM projects would occur from implementing the alternatives. The purpose of this chapter is to provide BLM decision-makers and the public with an analysis of the environmental consequences of implementing any of the alternatives proposed in Chapter 2.

Table 1: Summary Comparison of Alternatives

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Areas of Critical Environmental Concern (see section beginning on page 8 in Chapter 2)					
Areas of critical environmental concern (acres)	503	0	0	0	0
Cultural and Paleontological Resources (see sections beginning on pages 12 and 25 of Chapter 2)					
Hard shoreline stabilization allowed to protect cultural and paleontological values (acres). Soft stabilization allowed under all alternatives.	1,021	0	1,021	0	789
Habitat and Plants (see section beginning on page 16 in Chapter 2)					
Extent objective for forest and woodland (percent of Monument)	NA (current extent: 83%)	40%*	50%	48%	83%
Extent objective for grassland and shrubland (percent of Monument)	NA (current extent: 12%)	≥7%*	40%	47%	12%
Extent objective for wetlands (percent of Monument)	NA (current extent: 4%)	≥2%*	7%	4%	4%
Recreation (see sections beginning on pages 28 and 34 in Chapter 2)					
Designated recreation management areas (acres)	0	0†	1,011	1,014	1,021
Permit required for public access (acres)	0	1,021	167	4	0
Camping	214 acres with 13 designated campsites 517 acres open to dispersed camping	Monument closed to camping	214 acres with 13 designated campsites 726 acres open to dispersed camping by permit only	214 acres with 13 designated campsites Remainder of Monument closed to camping	436 acres open to designated site camping‡ 535 acres open to dispersed camping
Closed to discharge of firearms (acres)	0	0	0	612§ (partial closure) **Sub-Alternative C:** 1,021	0
Road miles open to public motorized use	1**	0	1	0.5	0.9

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Hiking (trail miles††)	16**	0	20	11.9 (also open to equestrian)	24.5 (also open to equestrian and bicycles)
Equestrian use (trail miles††)	16**	0	0	2.6	8.4
Bicycle use (trail miles ††)	16**	0	0	0	8.4
Visual Resources Management (see the section beginning on page 36 of Chapter 2)					
Class I (acres)	0	232	0	3	232
Class II (acres)	0	789	28	28	789
Class III (acres)	0	0	992	989	0
Class IV (acres)	0	0	0	0	0
Undesignated (acres)	1,021	0	0	0	0
Wilderness Characteristics (see the section beginning on page 37 of Chapter 2)					
Lands managed for wilderness characteristics (acres)	0	232	0	3	232

***** Under Alternative A, the BLM would allow natural succession to take place until one of these specified thresholds was crossed. For example, the Monument's grasslands and shrublands would be allowed to continue to convert to forests and woodlands until only 7 percent of the Monument was occupied by this community class (half of what currently exists).

†Under Alternative A, the BLM would facilitate access for authorized scientific, educational scientific, cultural, and spiritual uses, but not for recreation.

‡The BLM would identify specific designated sites during plan implementation; designated sites would occur on a fraction of this acreage. Under other alternatives, designated sites would be limited to the number that already exist within the Monument.

§These areas would be closed to the discharge of firearms except for half of firearm-based hunting season. The BLM would work with Washington Department of Fish and Wildlife annually to establish the closure period. This is currently how the San Juan County Land Bank manages Lopez Hill, the only non-Monument public land currently open to hunting on Lopez Island.

**There are currently no officially designated roads or trails in the Monument. All existing roads are currently open to motorized and non-motorized public access. All existing trails are currently open to all non-motorized uses (Proclamation 8947 prohibits public motorized access except on designated roads).

††These totals include trails under U.S. Coast Guard jurisdiction on lands at Cattle Point and Iceberg Point adjacent to the Monument. The BLM does not have jurisdiction over these lands but provides some on-the-ground management and will make recommendations to the U.S. Coast Guard regarding trails.

What are the Next Steps?

The comment period on this Draft RMP/EIS will extend for 90 days following publication of the EPA's Notice of Availability in the Federal Register (see planning process timeline in Appendix T). Upon comment period closure, the BLM will evaluate all written comments and develop responses to substantive comments. Substantive comments could lead to changes in one or more of the alternatives or in the effects analysis.

With help from consulting tribes and cooperating agencies, the BLM will then develop a Proposed RMP from one of the alternatives analyzed in the Draft RMP/EIS, or a newly developed alternative that pulls elements from a number of the alternatives analyzed in the Draft RMP/EIS. When developing the Proposed RMP, the BLM considers comments received and the analysis of effects from the alternatives, as well as agency priorities. The BLM will release the Proposed RMP/Final EIS for a public protest period and the Governor's consistency review.

Following resolution of any protests and completion of the Governor's consistency review, the BLM will prepare a Record of Decision and Approved RMP. The publication of the Record of Decision will represent the completion of the RMP process.

After the RMP is completed, the BLM will develop site-specific actions that meet the objectives and direction outlined in the Approved RMP. As necessary, the BLM will conduct further analysis under the National Environmental Policy Act to assess site-specific conditions and impacts from proposed actions.

Chapter 1: Introduction

The Bureau of Land Management's (BLM) Spokane District Office is developing a resource management plan (RMP) for the San Juan Islands National Monument (Monument). This RMP will provide the overarching objectives and direction for the Monument. There is currently no RMP for this area.

This Draft RMP/Environmental Impact Statement (EIS) describes the various alternative management approaches the BLM is considering for the Monument, along with an analysis of the potential effects of these alternatives. The BLM will consider public comments on the Draft RMP/EIS as it develops a Proposed RMP/Final EIS.

For more information about the BLM's planning process, and for the planning process timeline, see Appendix T.

Background on the San Juan Islands National Monument

On March 25, 2013, President Obama signed Proclamation 8947 (see Appendix N) designating the Monument. The Monument consists of 1,021 acres of land scattered across the San Juan Islands, which lie in the heart of the Salish Sea. This includes approximately 832 acres currently under BLM jurisdiction and approximately 189 acres withdrawn to the U.S. Coast Guard (Coast Guard) (i.e., currently under Coast Guard jurisdiction). The Coast Guard is in the process of relinquishing these withdrawals. The BLM is developing the RMP with the assumption that the relinquishment process will be completed in the near future. In the event that the relinquishment process is still ongoing when the planning process is completed, the RMP will not go into effect for these areas until they are under BLM jurisdiction.

The President established the Monument on these islands to "maintain their historical and cultural significance and enhance their unique and varied natural and scientific resources, for the benefit of all Americans." Proclamation 8947 provides a description of the objects of historic and scientific interest for which the Monument was designated (see Appendix R for a table of objects). The BLM manages the Monument as a component of the National Landscape Conservation System.

Proclamation 8947 prohibits certain activities within the Monument. Subject to valid existing rights, it withdraws the Monument from all forms of entry, location, selection, sale, leasing, or other disposition under the public land laws, including withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the proclamation. It also requires that, except for emergencies, Federal law enforcement, or authorized administrative purposes, motorized vehicle use only occur on designated roads and mechanized vehicle use (e.g., bicycles) only occur on designated roads and trails.

Description of the Decision Area and Planning Area

The Monument is the "decision area" for this planning effort; in other words, it is the area about which the BLM will make decisions. The Monument, and thus the decision area, encompasses only BLM-administered lands in the San Juan Islands. San Juan County contains the majority of the Monument; a small portion is in Skagit and Whatcom counties (see Table 2).

The term "planning area" refers to the broader San Juan Islands, which provide context for the BLM's potential decisions and may be indirectly affected by the actions taken in implementing the RMP. Map 1 shows both the decision area (the Monument) and the planning area (the broader map area).

The management objectives and direction in Chapter 2 of this document would apply only to the decision area (i.e., the Monument). However, readers can expect to see references to the broader San Juan Islands (i.e., the planning area) in Chapter 3 in order to describe the indirect and cumulative effects of the management alternatives. For example, the objectives and direction in Chapter 2 only address camping within the Monument. In Chapter 3, however, readers will see descriptions of camping opportunities

throughout the San Juan Islands to help explain the potential indirect effect of the alternatives on the supply and demand for camping within the planning area as a whole.

Table 2: Acres of Monument land within each county in the planning area

County	BLM-administered Acres	Coast Guard-administered Acres Co-managed with BLM*
San Juan	775	189* (66 acres at Iceberg Point, 60 acres at Point Colville, 63 acres at Kellett Bluff)
Skagit	1	0
Whatcom	56	0
Total	**842**	**189***

Note: all acres are estimates based on GIS data and rounded to the nearest acre

***** These acres are currently withdrawn to the Coast Guard. For the purposes of this planning effort, the BLM assumes that they will be relinquished by the Coast Guard and come under BLM administration in the near future. These undeveloped lands will undergo an assessment to determine their suitability for return to the public domain prior to the Department of the Interior's determination of whether to accept these lands.

Decisions to be Made

At the conclusion of the planning process the BLM will approve an RMP for the Monument. The BLM's planning regulations make clear that RMPs are a preliminary step in the overall process of managing public lands, and are "designed to guide and control future management actions and the development of subsequent, more detailed and limited scope plans for resources and uses" (43 CFR 1601.0-2). The decisions made through this process will meet the purpose and need and goals for the planning effort (see page 4), as well as the BLM's legal and policy mandates, to the extent consistent with Proclamation 8947.

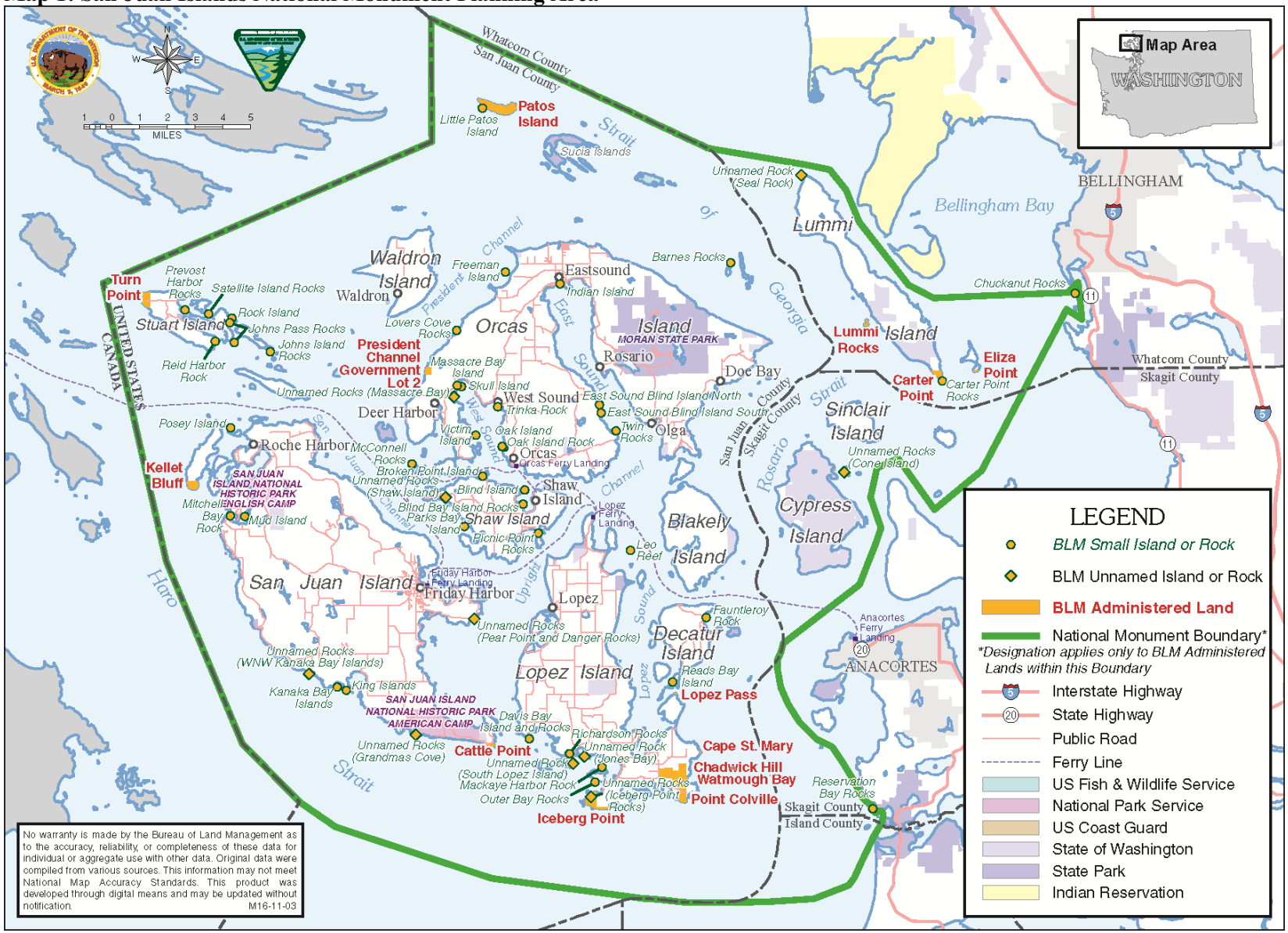
The RMP will include the following land use plan decisions:

- **Management objectives** for BLM-administered resources and activities.
- **Management direction** identifies future actions the BLM will take during plan implementation to meet the management objectives along with restrictions or requirements on those future actions.
- **Land use allocations** identify allowed, prohibited, and restricted uses for all or part of the Monument. For example, areas in which motorized vehicle use or camping is prohibited or allowed.

These land use plan decisions will guide the BLM's administration of the Monument over the next 15 to 20 years. After the plan is completed, the BLM will develop and implement site-specific actions that meet the RMP's objectives and direction. The BLM calls decisions to undertake such actions project- or implementation-level decisions.

In addition to land use plan decisions, this RMP effort will include implementation-level decisions for travel and transportation management. The BLM is undertaking implementation-level planning on this topic because of the limited amount of road and trail miles in the Monument (1 mile and 14.9 miles, respectively) and the strong public interest expressed during RMP scoping. Implementation decisions generally constitute the BLM's final approval allowing on-the-ground actions to proceed. The Draft Travel and Transportation Plan in Appendix H provides maps and descriptions of four potential road and trail networks that each meet the objectives of one of the draft alternatives analyzed in this document.

Map 1: San Juan Islands National Monument Planning Area



Purpose and Need

The Federal Land Policy and Management Act (FLPMA) and Proclamation 8947 establish the need for this action. The FLPMA requires the BLM to develop RMPs that provide for the use of public lands. The proclamation specifies that the BLM ‘‘shall prepare and maintain a management plan for the monument…” The BLM does not currently manage the Monument under an RMP.

The purpose of this RMP is to provide goals, objectives, and management direction to guide the BLM’s management of the Monument. These goals, objectives, and management direction must conserve, protect, and restore the objects of historic and scientific interest identified in Proclamation 8947.

What is a Purpose and Need statement?

The Purpose and Need for the planning effort identifies the problem the RMP must solve (i.e., the **need** for the plan) and the outcomes it must achieve (i.e., the **purposes** of the planning effort). For an alternative to be considered in the Draft RMP/EIS, it must address the need and achieve the purposes described in this statement.

The purpose of the RMP includes protection and restoration of cultural and historical resources identified in the proclamation, including traditional use areas of the Coast Salish people and archaeological remains of their villages, camps, and processing sites throughout the Monument. These include, but are not limited to, shell middens, reef net locations, and burial sites. Additionally, the purpose of the RMP includes protecting and restoring historical resources associated with early Euro-American settlement found in the Monument, such as lighthouses and associated structures.

The purpose of the RMP regarding scientific and ecological resources is to protect and restore the wide array of habitats described in the proclamation, including forests, fire dependent grasslands, and wetlands, as well as bluffs, rocky balds, and shorelines. The RMP will promote the continuation of the diversity of habitats critical to supporting a varied collection of native wildlife, including special status species.

An additional purpose of the RMP is to address increases in human uses of the Monument. The RMP will address recreation, education, and scientific uses consistent with the protection and restoration of the objects and values described above.

The RMP will also safeguard tribal treaty rights, and will, as provided for in the proclamation “in consultation with Indian tribes, ensure the protection of religious and cultural sites in the monument and provide access to the sites by members of Indian tribes for traditional cultural and customary uses, consistent with the American Indian Religious Freedom Act (42 USC 1996) and Executive Order 13007 of May 24, 1996 (Indian Sacred Sites).”

In determining the suite of management actions necessary to protect and restore the Monument for present and future generations, this RMP responds to three important sources of overarching requirements and guidance:

- Presidential Proclamation 8947 of March 25, 2013, which created the Monument and identified the objects for protection and restoration.
- Section 2002 of the Omnibus Public Land Management Act of 2009, which established the National Landscape Conservation System, of which the Monument is a unit, “in order to conserve, protect, and restore nationally significant landscapes.” This section also provides that the BLM manage these lands “in a manner that protects the values for which the components of the system were designated.”
- The FLPMA, which provides the basic underpinnings for the BLM’s management of public lands. Section 302 of the FLPMA states that the BLM is to manage public lands under the principles of multiple use and sustained yield “except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such

law." Therefore, as a general rule, if a presidential proclamation that designates a Monument conflicts with the FLPMA's multiple use mandate, the Monument designating language will apply.

Recognizing these purposes, there is a need for an RMP for the San Juan Island National Monument to ensure that the long-term management of these lands achieves a level of protection and restoration consistent with the guidance described above.

Vision and Goals

The vision for an RMP is an expression of long-term desired conditions for the decision area from an experiential viewpoint. The Monument Advisory Committee[6] developed the following vision statement for the Monument, which the BLM adopted:

The San Juan Islands National Monument provides an awe-inspiring experience that connects people to a flourishing, intact landscape, rich in natural, cultural, and historical features.

Goals are broad statements of desired outcomes that usually are not quantifiable. The Draft RMP/EIS examines alternative ways to achieve the goals to the extent allowed under laws and land ownership patterns. The goals for the RMP are as follows:

- Protect the cultural and historic values for which the Monument was designated
- Protect the ecological values for which the Monument was designated

Planning Criteria and Planning Issues

The BLM developed preliminary planning criteria before publishing the notice of intent to plan for this effort. Planning criteria guide development of the plan by identifying the "sideboards" that define the scope of the planning effort; the BLM generally bases them on applicable laws, national and BLM State Director guidance, and the results of public and government participation (43 CFR 1610.4-2). The BLM published an initial list of planning criteria in the Federal Register on March 2, 2015. After revising the planning criteria based on internal and external scoping, the BLM published the criteria in the scoping report, which can be found on the RMP website: https://go.usa.gov/xRphc.

Planning issues are disputes or controversies about existing and potential land and resource allocations, levels of resource use, and related management practices. The BLM often frames planning issues as questions that will be resolved through the planning process. The BLM has received a wide-variety of input from consulting tribes, cooperating agencies, and members of the public on how these issues should be resolved. The alternatives described in Chapter 2 explore different approaches to resolving these issues while meeting the purpose and need for the planning effort.

The planning criteria and planning issues for this effort can be found in Appendix L. They were initially published in the scoping report, which can be found on the RMP website: https://go.usa.gov/xRphc.

The public also suggested planning issues that the BLM considered but did not analyze in detail. Alternatives responsive to these issues that the BLM considered but did not analyze in detail are described in Appendix A.

Partnerships in the San Juan Islands

Much of the work carried out within the Monument is accomplished through partnerships with other governmental agencies, non-profit organizations, and volunteers. These partners are invaluable to the management of visitation, the monitoring of Monument lands, and the restoration of historic structures. Regardless of the decisions made through the planning effort these partnerships will remain essential to the effective management of the Monument.

[6] Proclamation 8947 required that the BLM "establish an advisory committee under the Federal Advisory Committee Act (5 USC App.) to provide information and advice regarding the development of [the RMP]." More information about the Monument Advisory Committee can be found on page 298 in Chapter 4.

Information about how cooperating agencies, consulting tribes, and members of the public have been involved in this planning effort can be found in Chapter 4.

When developing the Proposed RMP, the BLM will seek to be consistent with, or complementary to, the management approaches of its partners. As it moves forward with the planning process, the BLM will continue to consider the following plans affecting the San Juan Islands:

- National Park Service, San Juan Island National Historic Park General Management Plan and Environmental Impact Statement (2008)
- San Juan Islands Scenic Byway Steering Committee, San Juan Islands Scenic Byway Corridor Management Plan (2011)
- San Juan County, Community Wildfire Protection Plan (2012)
- San Juan County, Critical Areas Ordinance (2014)
- San Juan County, San Juan County Comprehensive Plan (2010, as revised)
- San Juan County, San Juan County Parks, Trails, and Natural Areas Plan and Non-Motorized Transportation Plan 2017-2022 (2016)
- San Juan County, Shoreline Master Plan (2017)
- U.S. Fish and Wildlife Service (U.S. FWS), Protection Island and San Juan Islands National Wildlife Refuges Comprehensive Conservation Plan and San Juan Islands Wilderness Stewardship Plan (2010)
- U.S. FWS, Recovery Plan for the Golden Paintbrush (2000)
- U.S. FWS, Recovery Plan for the Marbled Murrelet (Washington, Oregon, and California Populations) (1997)
- U.S. FWS and San Juan Island National Historic Park, National Park Service, Conservation Agreement and Strategy for the Island Marble Butterfly (2006)
- Washington State Department of Transportation Ferries Division Final Long-Range Plan (2009)
- Washington State Parks, Moran State Park Management Plan (2000)

Legal Obligations

The BLM will meet all pertinent legal obligations in managing the Monument. These obligations include, but are not limited to, tribal treaties, the Endangered Species Act, the National Historic Preservation Act, and the protective mandate of Proclamation 8947. The BLM will ensure that any Federal, State, or local permit required for any action implementing the RMP is obtained prior to authorizing or conducting the action. See Appendix K for further information on pertinent laws and regulations.

Maps and Acres in this Document

The BLM developed the maps and acres in this document using its current best geographic information system (GIS) data. Boundary information may improve over time. The Approved RMP will apply to all areas that the BLM determines are under its jurisdiction within the San Juan Islands.

The BLM has rounded all numbers in this document according to the following rules:

- Acres are rounded to the nearest whole acre (e.g., 2 acres rather than 1.8 acres)
- Miles are rounded to the nearest 10^{th} of a mile (e.g., 0.4 miles rather than 0.43 miles)
- Percentages are rounded to the nearest whole number (e.g., 10 percent rather than 10.2 percent)

Chapter 2: Alternative Approaches to Managing the San Juan Islands National Monument

Introduction

The BLM developed the action alternatives using input from the public, the Monument Advisory Committee, cooperating agencies, consulting tribes, and BLM staff. Management approaches that meet the purpose and need for the RMP, are technically or economically feasible, and are at an appropriate scale for a long-term management plan are included in the range of alternatives. Each action alternative describes an overarching approach that would guide the BLM's management actions for 15 to 20 years.

The BLM could potentially consider endless variations and combinations of plan components in the range of alternatives. The four action alternatives and one sub-alternative described in this Draft RMP/EIS do not provide all possible combinations but instead span the full spectrum of management approaches that would meet the purpose and need for the planning effort (see page 4).

During the implementation of the plan, the BLM will undertake numerous site-specific actions to achieve the objectives of the Approved RMP (e.g., vegetation treatments, archaeological surveys, development and placement of signs, maintenance of facilities). These implementation-level actions must conform to the Approved RMP, but are not identified in the draft alternatives or the Approved RMP. The BLM will conduct additional planning and NEPA compliance during plan implementation.

Alternatives considered but not analyzed in detail are found in Appendix A.

Preferred Alternative

Alternative B (described below) is the BLM preferred alternative. The BLM is required by regulation (43 CFR 1610) to identify a preferred alternative in the Draft RMP/EIS. It is simply the BLM's starting point for gaining public feedback to use in developing the Proposed RMP.

In developing a Proposed RMP, the BLM will consider making modifications to the preferred alternative in response to public comments; advice from consulting tribes, cooperating agencies, and the Monument Advisory Committee; and BLM priorities. The Proposed RMP may be a modification of the design of Alternative B, a modification of the design of a different alternative analyzed in the Draft RMP/EIS, a new alternative from within the spectrum of alternatives considered in the Draft RMP/EIS, or an alternative analyzed in the Draft RMP/EIS as written. The identification of the preferred alternative is not a commitment or decision. The BLM will develop a Proposed RMP after the end of the public comment period on the Draft RMP/EIS.

Implementation-level Plans and Administrative Actions

After the completion of the RMP, the BLM will work with its partners to develop implementation-level plans and undertake on-the-ground projects to achieve RMP objectives. Under all alternatives, the BLM would also continue to implement administrative actions. Administrative actions are routine transactions and activities that are required to serve the public and to provide optimum management of resources. All actions would be taken only in conformance with the Approved RMP. For a list of example implementation-level plans and administrative actions see Appendix J.

Plan Effectiveness Monitoring

The BLM will develop a monitoring plan to track the effectiveness of implementation of the Approved RMP. The monitoring plan will be an appendix to the Approved RMP. In the Proposed RMP, the BLM will identify, as appropriate, adaptive management actions that monitoring findings might trigger. Adaptive management actions must be within the range of alternatives described in this Draft RMP/EIS and would only be undertaken when specified triggers occur.

No Action Alternative

The No Action Alternative for an RMP/EIS is normally the continuation of the current RMP. The BLM-administered lands encompassing the Monument are unusual in that they are not covered by an RMP. Because of this, there are no plan-level objectives, direction, or allocations to describe for the No Action Alternative, except for the limited decisions made in the Area of Critical Environmental Concern (ACEC) decision (BLM 1990) described below. The ACECs were not developed as part of an RMP.

Under the No Action Alternative, the BLM would continue to administer Monument lands without the guidance of an RMP using a custodial approach. This custodial approach would focus on meeting legal and policy mandates— to the extent consistent with Proclamation 8947—and preventing unnecessary and undue degradation. The BLM would determine what actions it would take to meet these mandates on a case-by-case basis after completing the appropriate level of planning and NEPA compliance.

Restrictions on recreation within the Monument are currently limited to those explicitly described in Proclamation 8947 (see page 1), established in the ACEC decision (BLM 1990), or established under existing regulations or supplementary rules.

The Iceberg Point and Point Colville Areas of Critical Environmental Concern Decision Record (BLM 1990) provides some management direction for 503 acres of the Monument. The 1990 ACEC decision originally applied to the BLM-administered lands at Iceberg Point and Point Colville. The BLM extended the ACEC designation to Watmough Bay and Chadwick Hill after its acquisition of these areas. Activities prohibited in the ACECs include fires, trail construction, and camping. A full list of prohibited uses and management direction established through the ACEC decision can be found in Appendix D.

The BLM's special recreation permits regulation (43 CFR 2932) requires permits for any organized, commercial, or competitive uses of BLM-administered lands. Supplementary rules applying to all BLM-administered lands in Oregon and Washington prohibit: camping for longer than 14 days, leaving personal property unattended for more than 24 hours, leaving pets unrestrained in developed recreation sites (e.g., campgrounds and picnic areas with facilities), discharging a firearm into or from a posted no-shooting zone or into or from a developed recreation site, discharging or possessing a firearm or explosive device in violation of State law, and using non-weed free certified hay (See Appendix I for the supplementary rules). The BLM establishes no-shooting zones through an RMP decision, Federal Register notification, or other planning process. The Monument currently does not have any no-shooting zones.

Beyond these restrictions, Monument lands are generally open to recreational uses, though existing laws and regulations apply. For example, visitors may currently land paddle craft (e.g., kayaks, canoes, paddleboards) on all Monument rocks and islands, but must not violate the Marine Mammal Protection Act by harassing marine mammals or the Migratory Bird Treaty Act by pursuing, hunting, taking, capturing, selling, or killing migratory birds.

The BLM, working with its partners, currently carries out limited management activities within the Monument. These activities include removing hazard trees that pose a threat to safety or property, providing basic visitor facilities (e.g., vault toilets) in some locations, protecting cultural resources against imminent threats, providing education and interpretation, and restoring aspects of historic structures. No mineral extraction, grazing, commercial forestry, or energy production occurs within the Monument.

A note on ACECs

The 1990 ACEC decision provided management direction that helped protect the BLM-administered lands on the south end of Lopez Island prior to the designation of the Monument in 2013. The designation of the Monument broadened and made permanent the protection of the area's special objects and values.

As described in Appendix C, the BLM found the entire Monument, including the land composing the current ACECs, to possess values meeting the relevance and importance criteria described in the ACEC Manual, but did not find that these values meet the criterion of requiring additional special management in the context of the alternatives considered in this Draft RMP/EIS. In large part, this was due to the overlap between the identified relevant and important values and the Monument objects and values, which the alternatives must protect in order to meet the purpose and need.

The ACECs are analyzed as part of the No Action Alternative. The action alternatives do not include ACECs (see page 212 and Appendix C).

Action Alternatives

The action alternatives are described below through subsections that address the values and activities about which the BLM will make decisions. For example, the cultural resources subsection includes the objectives and direction the BLM would follow regardless of the Approved RMP (common to all action alternatives) and the varying objectives and direction the BLM is considering under each alternative. The BLM would implement objectives and direction listed under "common to all action alternatives" under all potential versions of the RMP, i.e., they would be in addition to direction under each individual alternative.

Table 3 provides a summary of major differences between the alternatives. It is a high level summary; it includes neither direction common to all action alternatives nor the details of the alternative's objectives and direction, both of which are found in the sub-sections below. Summary tables for the range of alternatives pertaining to each resource and use can be found in Appendix S.

Table 3: Summary of major elements that differ between alternatives

	No Action Alternative[7]	Alternative A	Alternative B	Alternative C	Alternative D
Cultural Resources[8] (see page 12 for more details and elements that do not vary by alternative)	There would continue to be no plan-level decisions related to cultural resources. The BLM would continue with custodial management of cultural resources, including undertaking stabilization and rehabilitation projects as necessary to protect them.	Monitor and protect existing historic structures from impairment or loss. Do not add structures. Take action when required by law or policy. Allow soft shoreline stabilization to protect cultural resources. Prohibit hard stabilization methods.	Restore/rehabilitate existing historic structures to their historic appearance. Do not add structures. Allow hard stabilization methods, in addition to soft stabilization, to prevent damage to cultural resources from sea level rise and increased storm surge.	Restore/rehabilitate historic structures to their historic appearance. Allow the reconstruction of historically present, but currently absent structures. Do not otherwise add structures. Allow soft shoreline stabilization to protect cultural resources. Prohibit hard stabilization methods	Restore/rehabilitate structures to their historic appearance. Allow reconstruction and develop new structures to allow for greater visitor use, including, potentially, overnight use of some facilities by docents. Allow soft shoreline stabilization to protect cultural resources; allow hard stabilization methods in areas without wilderness characteristics.
Habitat/ Plant Community Management (see page 16 for more and elements that do not vary by alternative)	There would continue to be no plan-level decisions related to habitat and plant community management.	Manage vegetation minimally to allow natural succession. Monitor and intervene when thresholds are crossed to protect the diversity of plant communities.	Manage vegetation to enhance the San Juan Islands ecological resilience and resistance, including enhancing the extent of relatively scarce habitats, i.e., grasslands and wetlands.	Restore habitats to the approximate extent and condition existing prior to Euro-American settlement when Coast Salish tribes managed the landscape using fire.	Maintain vegetative communities at the approximate current (2016) extent and condition.

[7] Under the No Action Alternative, the BLM would continue to take management actions on a case-by-case basis as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947.

[8] The Cultural Resources section addresses cultural and historic sites. The Monument's landscapes also have cultural values associated with plant communities and wildlife populations; the management of these values is described under the Habitat and Plants and Wildlife sections. The impact of plant communities on tribal interests is described under the Chapter 3 Tribal Interests section beginning on page 224.

	No Action Alternative[7]	Alternative A	Alternative B	Alternative C	Alternative D
Habitat/ Plant Community Management (continued) continued	The BLM would continue with custodial management of vegetation, including removing hazard trees and limited treatment of invasive plants.	Prohibit chemical treatments (e.g., herbicides) and prescribed fire.	Consider all vegetation management methods when designing projects to achieve habitat and plant community objectives.	Consider all vegetation management methods when designing projects to achieve habitat and plant community objectives. **Sub-Alternative C:** prohibit chemical treatments (e.g., herbicides).	Consider all vegetation management methods when designing projects to achieve habitat and plant community objectives.
Recreation (see page 28 for more details and elements that do not vary by alternative)	The 1990 ACEC decisions would continue for Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay: BLM would prohibit camping and require permits for organized groups. There would continue to be no plan-level decisions for the rest of the Monument. Monument would continue to be open to all non-motorized trail uses, designated and dispersed camping (outside of the ACECs), and the discharge of firearms.	Facilitate authorized scientific, educational, and spiritual and traditional uses. Prohibit recreational use of the Monument (e.g., hiking, equestrian use, bicycle use, camping, etc.). This restriction does not apply to traditional tribal activities.	Facilitate hiking, current designated site camping, and dispersed camping by permit. Manage for quiet and solitude by dispersing users on an expanded trail network and managing some areas for permit-only recreation. Prohibit equestrian and bicycle use on trails.	Facilitate hiking, some equestrian trail use, and current designated site camping. Reduce existing trail network. Prohibit bicycle use on trails. Close lands with identified conflicts between hunting and other visitor uses to the discharge of firearms for half of hunting season [9]. **Sub-Alternative C**: Close the Monument to the discharge of firearms[9].	Facilitate hiking, equestrian and bicycle trail use, and expanded dispersed and designated site camping. Expand the trail network based on requests from the public for new trails.

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[9] BLM-administered lands on which firearm discharge is not prohibited are open to this use, though may be subject to temporary closures for emergencies and public health and safety concerns.

Cultural Resources

Background

Proclamation 8947 identifies historic and cultural values as objects for which the Monument was established. The cultural importance of the Monument lands to Coast Salish tribes continues today. Cultural resources addressed in this section include buildings, structures, places, and archaeological sites with historical and/or cultural values, as well as sacred sites and traditional cultural properties and landscapes. The Monument also has cultural values associated with plant and wildlife populations; the management of these values is described below under Habitat and Plants and Wildlife.

This document is using the term maritime heritage area to refer to the aids to navigation (i.e., lighthouse) facilities and surrounding lands at Turn Point, Patos Island, and Cattle Point (see Map 2 on page 62). These total approximately 28 acres of Monument land.

See Tribal Interests beginning on page 33 and Habitat and Plants beginning on page 16 for management objectives and direction related to traditional tribal activities and the exercise of treaty rights and the management and harvest of culturally important plant resources.

See Appendix S for a summary table of the differences between the alternatives for cultural resources. For the current cultural resource conditions in the Monument see to the section beginning on page 45.

No Action Alternative

There would continue to be no plan-level decisions related to cultural resources. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Identify and protect historically significant cultural resources (i.e., those eligible for listing on the National Register of Historic Places).

Management Direction:

- Consult with Tribes and Tribal Historic Preservation Officers (THPOs), the Washington State Historic Preservation Officer (SHPO), and other interested parties when undertaking actions to implement the plan.
- Conduct proactive identification and documentation of cultural resources.
- Identify whether cultural resources are present before authorizing ground disturbing activities. Where cultural resources are identified, modify the project to avoid or reduce impacts.
- Temporarily stabilize cultural or historic sites as necessary to recover cultural data in consultation with SHPO and tribes.
- Allow excavation and recovery of scientific and/or historic values of cultural or historic sites through practices such as data recovery (e.g., by excavation, relocation, or documentation), if avoiding disturbance is not possible or where natural disturbances makes loss of values unavoidable.
- Fence, sign, and/or use natural materials such as driftwood to reduce damage and allow for stabilization and repair where human activity is causing substantial impairment of cultural resources.
- Allow shoreline stabilization using soft stabilization methods that employ primarily natural materials, such as live plants, logs, root wads, and vegetative mats where cultural resources are in danger of being lost due to shoreline erosion.

- Allow use of structures within maritime heritage areas for educational and interpretive activities where compatible with health and safety requirements if the use will not adversely affect the cultural, historical, or other resource values.
- In collaboration with other governmental and non-governmental entities, identify and implement actions to address threats to cultural resources due to disasters or disturbances such as sea level rise, increased storm surges, seismic events/tsunamis, and oil spills.
- Manage vegetation in maritime heritage areas as needed to protect human health and safety and historic structures (e.g., hazard tree management).
- Complete undertakings affecting historic properties—including Maritime Heritage Properties—in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Alternative A

Shoreline Erosion Management Direction:

- Prohibit the use of hard shoreline stabilization methods, such as riprap.

Maritime Heritage Area Objective:

- Manage to prevent impairment or loss of cultural resources.

Maritime Heritage Area Management Direction:

- Undertake projects only as needed to prevent deterioration of cultural resources from current condition, except to replace a historic structure currently present on the property in the event of its destruction (e.g., due to an earthquake or tsunami).
- Manage vegetation only to prevent damage to cultural resources and to allow needed maintenance of structures using manual, mechanical, chemical, or biological vegetation treatments.
- Prohibit chemical treatments (e.g., herbicides) in achieving cultural resource objectives.

Alternative B

Shoreline Erosion Management Direction:

- Allow both soft and hard shoreline stabilization methods to protect cultural resources.

Maritime Heritage Area Management Objectives:

- Manage to prevent impairment of cultural resources, protect the integrity of the setting, and restore structures to their historic appearance.
- Improve the resilience of cultural resources to disturbances, including sea level rise, increased storm surge, fire, and seismic activity.

Maritime Heritage Area Management Direction:

- Restore and/or rehabilitate and maintain existing historic structures.
- Prohibit construction or reconstruction of structures, except to replace a historic structure currently present on the property after its destruction (e.g., due to an earthquake).
- Undertake projects to increase the stability of buildings and other structures to reduce impacts from disturbances, including sea level rise, increased storm surge, and seismic activity.
- Manage vegetation to minimize risk to cultural resources from fire and other disturbance using manual, mechanical, chemical, or biological vegetation treatments. This may include undertaking projects to remove fuels and potential hazard trees around historic structures even where this is not in keeping with the historic appearance of the property.

Alternative C

Shoreline Erosion Management Direction:

- Prohibit the use of hard shoreline stabilization methods, such as riprap.

Maritime Heritage Area Management Objectives:

- Manage to prevent impairment of cultural resources, protect the integrity of the setting, and restore and rebuild structures to their historic appearance.

Maritime Heritage Area Management Direction:

- Restore and/or rehabilitate and maintain existing structures.
- Allow reconstruction of structures that were present historically.
- Prohibit restoration, rehabilitation, or construction projects that adversely affect the historic properties' appearance or setting.
- Manage vegetation to protect the integrity of the setting using manual, mechanical, chemical, or biological vegetation treatments.

Sub-Alternative C (same cultural resource management direction as Alternative C with the exception of the direction below)

Management Direction:

- Prohibit the use of chemical treatments (e.g., herbicides).

Alternative D

Shoreline Erosion Management Direction:

- Allow both soft and hard (e.g. rip rap) shoreline stabilization methods to protect cultural resources, except in areas that have wilderness characteristics. Allow only soft stabilization and prohibit hard shoreline stabilization methods in areas that have wilderness characteristics (see page 37).

Maritime Heritage Area Management Objectives:

- Manage to prevent impairment of cultural resources and maintain the setting's historic appearance.
- Provide for greater use of the Maritime Heritage Area by visitors and docents.

Maritime Heritage Area Management Direction:

- Restore and/or rehabilitate and maintain existing structures.
- Allow reconstruction of structures that were present historically.
- Adapt and/or modify some structures to facilitate greater use by visitors, including, potentially, overnight use of some facilities by docents.
- Build new structures to facilitate recreation, education, interpretation, and facilities support.
- Manage vegetation to protect the integrity of the setting using manual, mechanical, chemical, or biological vegetation treatments.

Education and Interpretation

Background

Proclamation 8947 describes the Monument as "a classroom for generations of Americans." The BLM will continue to work with partners on educational and interpretive efforts under all alternatives.

See Appendix S for a summary table of the differences between the education and interpretation alternatives. For current education and interpretation conditions see the section beginning on page 70.

No Action Alternative

There would continue to be no plan-level decisions directly related to education or interpretation. The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions direct the BLM to "place signs to control visitor use as necessary."

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to

meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Provide high-quality education and interpretation about the Monument and its objects and values.

Management Direction:

- Coordinate with partners across to ensure high-quality, effective interpretation and education and to seek consistency with other Tribal, Federal, State, and local governments, where possible.
- Develop educational and interpretive materials, including those that would be available via electronic media and off-site, on a variety of themes, including those listed in Appendix J: Implementation-Level Plans and Administrative Actions.

Alternative A

Management Direction:

- Install signs only as necessary to protect Monument objects and values and public health and safety.

Alternative B

Management Direction:

- Install signs beyond trailheads and landing sites only as necessary to provide directional information and to protect Monument objects and values and public health and safety. In order to limit structures on the landscape, restrict educational or interpretive information to trailheads and landing sites.

Alternatives C and D

Management Direction:

- Install signs to provide educational and interpretive messages, as well as to provide directional information and protect Monument objects and values and public health and safety, except in lands managed for their wilderness characteristics. In lands managed for their wilderness characteristics, install signs only as necessary to protect Monument objects and values and public health and safety.

Grazing

Background

There is currently no livestock grazing taking place within the Monument. The Monument is not in a grazing district or allotment.

No Action Alternative

The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions prohibit the grazing of livestock within these areas.

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

The Monument would be unavailable for preference-based grazing under the authority of the Taylor Grazing Act, i.e., the BLM would not issue preference leases or permits for grazing within the Monument and would not allocate forage for grazing. In implementing the plan, the BLM may consider using biological controls—including grazing by goats or other livestock—to achieve habitat and plant community objectives.

Habitat and Plants[10]

Background

Proclamation 8947 identifies the Monument's diverse habitats and plant communities as among the objects for which it was established. The extent of plant communities is changing due to ecological succession and the absence of fire. Prior to Euro-American settlement, Coast Salish tribes used fire to maintain grasslands in the San Juan Islands. Due to a discontinuation of these traditional stewardship practices and other historic activities, encroaching forest vegetation is gradually reducing grassland acreage. Without management intervention, these communities will continue to decline.

During the 15 to 20-year life of the plan, the BLM will design and execute vegetation treatments—which will require additional decisions and public review—to achieve the RMP's objectives.

Special status plant species addressed in this document are those that are on the BLM Interagency Special Status Sensitive Species Program list (see the section beginning on page 117 for more information).

The deed to Watmough Bay, which the BLM acquired in 1992, includes a conservation easement. This conservation easement restricts the BLM's management of Watmough Marsh. Since the BLM is bound to abide by the terms of this easement, it is only considering the approach identified in the easement (described below under common to all action alternatives).

See Appendix S for a summary table of the differences between the alternatives for habitat and plants. For current conditions related to habitat and plants see the section beginning on page 73.

No Action Alternative

There would continue to be no plan-level decisions directly related to vegetation management. The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions direct the BLM to design actions to protect Federal and State listed species.

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis. For example, the BLM would continue to address hazard trees and provide some control of invasive plant species (currently it undertakes approximately 20 acres of treatment per year).

Common to All Action Alternatives

Habitat and Plant Communities Management Objective:

- Protect the diversity of plant communities described in Proclamation 8947.

Habitat and Plant Communities Management Direction:

- Fence and/or sign areas to reduce damage and allow for recovery where human activity is causing substantial vegetative degradation.
- Manage vegetation as needed to protect human health and safety (such as hazard tree management).
- Seed and plant culturally important plants, such as camas, as part of vegetation management efforts, where possible.
- Select from best management practices for vegetation treatments (Appendix F) to maintain water quality when conducting implementation-level projects.
- Apply BLM mandated standard operating procedures for any application of herbicide.[11] Standard operating procedures are located in Appendix B (Table B-2) of the BLM's 2007 Record of Decision

[10] The habitat and plants objectives and direction would apply to the Monument except the 28 acres within maritime heritage areas; direction for the maritime heritage areas is provided under the Cultural Resources section.
[11] Alternative A and Sub-Alternative C would not allow the use of chemical treatments (e.g., herbicides).

for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement and Appendix A of the BLM's 2016 Record of Decision for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement.

Invasive Plant Species Management Objective:

- Control invasive plant species within the Monument.

Invasive Plant Species Management Direction:

- Eradicate and/or control noxious weed species designated by Washington State for mandatory eradication or control. Tools available for control vary by alternative.

BLM Special Status Plant Management Objective:

- Manage BLM sensitive plant species to avoid the listing of plants under the Endangered Species Act.

BLM Special Status Plant Management Direction:

- Conduct pre-disturbance surveys prior to management actions that might disturb BLM sensitive plants in areas where suitable habitat for such plants is suspected. Where BLM sensitive plants are found, modify the project to avoid or reduce impacts.
- Fence and install signs as necessary to protect BLM sensitive plants.
- Remove encroaching native plants and non-native vegetation where the BLM determines that they are negatively affecting nearby BLM sensitive plants and replace with non-competitive native plants.

Watmough Marsh Management Objective:

- Manage Watmough Marsh in accordance with the restrictions imposed by the conservation easement.

Watmough Marsh Management Direction:

- Prohibit management actions that would change, disturb, alter, or impair the plant and animal habitat, ecological value, or scenic qualities of the marsh, in accordance with the easement. This includes not building any structures, roads, or trails in the marsh; not draining water into or out of the marsh; and not pruning, cutting, defoliating, or extracting any vegetation from the marsh.

Alternative A

Habitat and Plant Communities Management Objectives:

- Allow natural succession and other processes to take place within the Monument while maintaining 50 percent of the extent of the plant communities described in Proclamation 8947. Specifically[12]:
  - Maintain grassland and shrubland on ≥ 7 percent of the Monument.
  - Maintain forest and woodland on ≥ 40 percent of the Monument.
  - Maintain wetland on ≥ 2 percent of the Monument.

Habitat and Plant Communities Management Direction:

- Undertake vegetation management only as provided under common to all action alternatives or when the extent of a plant community within the Monument falls below the threshold in the objectives.[13]

[12]These percentages maintain at least 50 percent of the approximate extent of each of the major plant communities within the Monument as of 2016.

[13] An acre of land would transition from one plant community to another once it has crossed an ecological threshold such that substantial time, energy, and effort would be required to return the plant community to its original state, e.g., tree saplings—as opposed to just seedlings—have become established in meadow areas.

- Allow mechanical, manual, and biological control methods to achieve habitat and plant communities objectives.
- Prohibit the use of chemical treatments (such as herbicides) and prescribed fire to achieve habitat and plant communities objectives.
- Require the use of native seed or other native plant propagules from appropriate geographic zones[14] for vegetation projects (including invasive plant treatments, as needed), unless it is unavailable within the timeframe of the project.

Invasive Plant Species Management Direction:

- Control and contain invasive plant species when an average of less than 50 percent cover by native vegetation remains in a vegetative community across the Monument (e.g., total Monument grasslands and shrublands, not grasslands and shrublands at Iceberg Point). This is in addition to common to all action alternatives direction on noxious weed species designated by Washington State.
- Allow mechanical, manual, and biological control methods to control and contain invasive plants. Apply biopesticides (a type of non-chemical biological control) where applicable and approved by EPA and BLM national programs.
- Prohibit the use of chemical treatments, such as herbicides, and prescribed fire to control and contain invasive plants.

BLM Special Status Plants Management Direction

- See common to all management direction

Alternative B

Habitat and Plant Communities Management Objectives:

- Enhance the San Juan Islands' ecological resistance and resilience by increasing the extent of native plant communities—specifically grasslands and wetlands—that are currently scarce within the San Juan Islands relative to past conditions. Specifically:
  - Restore and/or maintain grassland and shrubland on approximately 50 percent of the Monument (tree savanna[15], such as oak savanna, would contribute to this objective).
  - Restore and/or maintain forest and woodland on approximately 40 percent of the Monument.
  - Create, restore, and/or maintain wetland on approximately 7 percent of the Monument.
- Maintain forest communities identified by Washington Natural Heritage Program (WNHP) as G1S1, i.e., critically imperiled globally and in Washington State (this includes approximately 35 acres of Monument forest, see page 122). The BLM could undertake treatments to maintain or restore these communities, but would not convert them to wetland or grassland and shrubland. For this alternative, the BLM determined it was more important to expand grasslands than to maintain the WNHP priority ecological communities not ranked G1S1.
- Maximize native species richness and structural component diversity within each of the three major plant communities (wetlands, grasslands and shrublands, and forests and woodlands) to the extent that doing so is not detrimental to site-scale resilience. Specifically:
  - Within wetland communities, maximize native hydrophytic (i.e., aquatic) plant species richness and wetland processes (e.g., water storage, nutrient transformation).

[14] Information on seed zones can be found through the U.S. Forest Service's Seed Zone Mapper tool, which is available here: www.fs.fed.us/wwetac/threat_map/SeedZones_Intro.html

[15] According to the BLM Forest Inventory System, savanna has less than 10 percent tree cover. Oak habitat with more than 10 percent tree cover is considered woodland; all oak habitat currently within the Monument is woodland.

- Within grassland and shrubland communities, maximize native grassland species richness; the objective would not necessarily be to eradicate shrubs, but the emphasis would be to maximize species richness and structural diversity of forbs.
- Within areas of the Monument that would remain non-savanna forest and woodland, manage vegetation to achieve late successional characteristics. Maintain a maximum of 5 percent of forest in early seral condition (early seral condition is well represented in the San Juan Islands).

- Manage for vegetation structures and species compositions that increase resistance to and resilience from fire, drought, insect pests, disease, and climate change.

Habitat and Plant Communities Management Direction:

- Allow mechanical, manual, biological control, chemical, and fire treatment methods to achieve objectives.
  - Examples of actions the BLM would take to achieve these objectives include tree removal to expand shrub and grasslands, removal of plants within wetlands (e.g., cutting trees in forested wetlands to increase species diversity and improve hydrologic conditions), excavation to expand wetlands and increase the diversity of wetland depths, and tree topping, tree removal, and other silvicultural methods to increase forest late successional characteristics.
- Allow use of naturally ignited wildfires to help achieve vegetation management objectives, but only on islands that are entirely within the BLM's jurisdiction.
- Work with the U.S. FWS on projects to enhance habitat conditions for federally listed or candidate wildlife species that are primarily using non-native host plants, including, as necessary, the maintenance or establishment of non-native plant populations[16]. Such actions would not include noxious weed species designated by Washington State for mandatory eradication or control.
- Require the use of native seed or other native plant propagules from appropriate geographic zones[14] for vegetation projects (including invasive plant treatments, as needed), unless it is unavailable within the timeframe of the project, or unless BLM specialists determine that changing climate conditions would make seeds from long-lived species from other zones more suitable in the long-term.

Invasive Plant Species Management Direction:

- Allow mechanical, manual, biological control, chemical, and fire treatment methods to control and contain invasive plant species. Apply biopesticides (a type of non-chemical biological control) where applicable and approved by EPA and BLM national programs.
- Apply early detection and rapid response principles when an invasive plant infestation is identified within the Monument.

BLM Special Status Plants Management Direction:

- Introduce rare species present in the San Juan Islands ecoregion, such as the federally threatened golden paintbrush (*Castilleja levisecta*), to potential Monument habitat to reduce risk of extinction. Introductions could occur even at sites where historic records do not exist for these species.
- Augment existing BLM sensitive plant occurrences with locally sourced out-plantings on appropriate Monument lands.

Alternative C

Habitat and Plant Communities Management Objectives:

- Reestablish the approximate extent and condition of plant communities that existed prior to Euro-American settlement of the San Juan Islands (approximately 1860), when Coast Salish peoples used fire to manage landscapes. Specifically:

[16] E.g., the larval form of the island marble butterfly (*Euchloe ausonides insulanus*), a species proposed by the U.S. FWS for Endangered Species Act listing, currently uses three species of host plants, two of which are non- native.

- Restore and maintain native grassland and shrubland on approximately 48 percent of the Monument (tree savanna, such as oak savanna, would contribute to this objective).
- Restore and maintain native forest and woodland on approximately 47 percent of the Monument.
- Maintain native wetland on approximately 4 percent of the Monument.
- Restore and maintain grassland and shrubland and forest and woodland in the less densely vegetated conditions such as relatively frequent, low intensity fires would have produced.

- Maintain forest communities identified by WNHP as G1S1, i.e., critically imperiled both globally and in Washington State (this includes approximately 35 acres of Monument forest, see page 122). The BLM could undertake treatments to maintain or restore these communities, but would not convert them to grassland and shrubland. For this alternative, the BLM determined it was more important to expand grasslands than to maintain the WNHP priority ecological communities not ranked G1S1.
- Reduce the threat of high-severity wildland fire or other major disturbance events.

Habitat and Plant Communities Management Direction:

- Refer to historical documents, such as historical land and aerial photos, USGS or General Land Office survey sheets, descriptions from early settlers and explorers, and traditional ecological knowledge, to determine the appropriate vegetation conditions for reestablishment through specific treatment.
- Allow use of mechanical, manual, biological control, chemical, and fire treatment methods to achieve objectives.
  - Examples of actions that the BLM would take to achieve these objectives include removing trees to expand shrub and grasslands within the Monument; topping, pruning, and removing trees to create more open (i.e., less dense) forest conditions to restore stands to approximate historic tree density, composition, and structure, including, in some cases, tree savanna condition; protecting and enhancing conditions for large and old trees.
  - Use prescribed fire as the preferred method for maintaining desired conditions once established.
  - Allow use of naturally ignited wildfires to help achieve vegetation management objectives only on islands that are entirely within the BLM's jurisdiction and on the Watmough Bay-Chadwick Hill-Point Colville parcel.
- Require the use of native seed or other native plant propagules from appropriate geographic zones[14] for vegetation projects (including invasive plant treatments, as needed), unless it is unavailable within the timeframe of the project.
- Augment or reintroduce populations of culturally important plants, such as camas (*Camassia leichtlinii* and *C. quamash*), that were more prevalent in the 1860s.

Invasive Plant Species Management Direction:

- Allow use of mechanical, manual, chemical, biological, and fire treatment methods to control and contain invasive plant species. Apply biopesticides (a type of non-chemical biological control) where applicable and approved by EPA and BLM national programs.
- Apply early detection and rapid response principles[17] when an invasive plant infestation is identified within the Monument.

BLM Special Status Plants Management Direction

- See common to all management direction.

Sub-Alternative C (same Habitat and Plant Communities objectives and direction as Alternative C, except that the direction below replaces references to chemical treatment methods)

[17] See the glossary for more information about early detection and rapid response.

Management Direction:

- Prohibit use of chemical treatments (such as herbicides) to achieve habitat and plant communities and invasive plant species objectives.

Alternative D

Habitat and Plant Communities Management Objectives:

- Maintain approximate extent of plant communities that are documented on the landscape as of 2016:
  - Maintain grassland and shrubland on approximately 12 percent of the Monument.
  - Maintain forests and woodland on approximately 83 percent of the Monument.
  - Maintain wetland on approximately 4 percent of the Monument.
- Reduce the threat of high-severity wildland fire or other major disturbance events.
- Maintain vegetation structure and species composition in existing conditions. Define existing conditions in terms of maintaining current seral stages and plant species composition associated with the Monument's ecological site types.

Habitat and Plant Communities Management Direction:

- Allow use of mechanical, manual, biological control, chemical, and fire treatment methods to achieve objectives.
  - Allow use of naturally ignited wildfires to help achieve vegetation management objectives only on islands that are entirely within the BLM's jurisdiction.
- Maintain existing populations of culturally important plants.
- Require the use of native seed or other native plant propagules from appropriate geographic zones[14] for vegetation projects (including invasive plant treatments, as needed), unless it is unavailable within the timeframe of the project.

Invasive Plant Species Management Direction:

- Allow use of mechanical, manual, chemical, biological, and fire treatments to control and contain invasive plant species. Apply biopesticides (a type of non-chemical biological control) where applicable and approved by EPA and BLM national programs.
- Apply early detection and rapid response principles when an invasive plant infestation is identified within the Monument.

BLM Special Status Plants Management Direction

- See common to all management direction.

Hazardous Materials

Background

The BLM follows Federal and State law and policy in addressing current and future issues related to hazardous materials.

The BLM is aware of one contaminated area within the Monument. Turn Point Light Station on Stuart Island contains lead contaminated soil, generated from decades of lead-based paint weathering and flaking from the buildings into the soil. The BLM encapsulated the lead-based paint on the exterior of the buildings to ensure the release of this substance from the buildings is contained. The BLM is currently evaluating the site under the Comprehensive Environmental Response, Compensation, and Liability Act.

No Action Alternative

There would continue to be no plan-level decisions related to hazardous materials. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Maintain land health and public health and safety by responding to and remediating contamination and restoring natural resources injured by releases of hazardous substances or petroleum products.

Management Direction:

- Develop and implement project design features that prevent future hazardous materials incidences.
- Address new incidences of hazardous materials within the Monument according to procedures in the BLM Spokane District's Contingency Plan for Emergency Preparedness and Response to Oil and Hazardous Material Incidents (BLM 2016c).
- Evaluate, prioritize, and remediate newly discovered or reported hazardous material sites or incidences in a timely manner using standard procedures consistent with BLM delegated authority, Federal and State laws, and policies.
- Prohibit unauthorized storage, treatment, or disposal of hazardous materials and hazardous and solid wastes within the Monument.
- For an incident of a magnitude requiring a coordinated Federal response, such as a large oil spill:
    - Provide support to the Department of the Interior's Regional Environmental Officer, at the Office of Environmental Policy and Compliance in Portland, OR, who would coordinate the BLM response with the Coast Guard Federal On-Scene Coordinator.
    - Follow the Northwest Area Contingency Plan. The Northwest Area Contingency Plan is available at: www.rrt10nwac.com/nwacp/
- Ensure that BLM employees and contractors who work with and around hazardous materials are properly trained and equipped, as prescribed in applicable Federal and State law and BLM policy.
- Review lands and realty actions involving hazardous materials for compliance with Federal and State laws and regulations and BLM policy. Develop special stipulations as necessary as part of the right-of-way, permit, lease, or other action.
- Review real property transactions prior to the action for recognized environmental conditions using applicable Federal and State laws and policy.[18]
- Ensure that all actions authorizing subsequent use of previously remediated sites comply with Federal and State regulations. Develop necessary special stipulations as part of the permit, lease, or other action to protect human health and the environment.
- Monitor the effectiveness of corrective actions at hazardous material sites.
- Select from best management practices for vegetation treatments (Appendix F) to maintain water quality when conducting implementation-level projects involving hazardous materials.

[18] See BLM Handbook H-2000-01: Pre-Acquisition Environmental Site Assessment for more information

Lands and Realty

Background

Proclamation 8947 withdraws the Monument from all forms of entry, location, selection, sale, leasing, or other disposition under the public land laws, including withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the proclamation.

See Appendix S for a summary table of the differences between the alternatives for lands and realty. For current conditions related to lands and realty see the section beginning on page 137.

No Action Alternative

The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions prohibit new rights-of-way in for additional roads, powerlines, pipelines, or communication facilities. They also direct the BLM to survey and clearly mark the boundaries of Point Colville and Iceberg Point and acquire public access to these lands. There would continue to be no plan-level decisions related to lands and realty outside of the ACECs.

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Land Tenure Management Objectives:

- Protect and enhance Monument objects and values through land tenure actions.

Land Tenure Management Direction:

- Coordinate with the Coast Guard on the relinquishment of the remaining lighthouse withdrawals.
- Consider acquisitions on a case-by-case basis. When reviewing a potential acquisition or exchange, consider criteria that include, but are not limited to:
    - The value or importance of the property to Monument objects and values[19] and the likely long-term resource value of the property.
    - The function of the property to expand or secure legal public access to the Monument.
    - The level of threat to the property's resources (e.g., from development).
    - The potential that the property will diminish in extent over time due to rising sea levels and erosion from increased storm surges.
    - The potential for acquired land to support camping and/or facilities for administrative use by BLM or its partners.
    - The role of partnering public and governmental entities in the acquisition.
    - The potential for acquired land to contribute to shared conservation objectives across the broader San Juan Islands.
    - The uniqueness of the opportunity.
    - The availability of funding.
- When new lands are incorporated into the Monument—through an acquisition, the identification of new lands under BLM jurisdiction within the San Juan Islands, the BLM's acceptance of lands relinquished by the Coast Guard, or the reversion of interests in lands currently held under a

[19] Monument objects and values include the Native American/Coast Salish and Maritime Heritage associated cultural values, paleontological values, diverse habitats, and diverse wildlife found within the Monument.

Recreation and Public Purposes Act patent or a special act patent—these lands would be managed under the provisions of this RMP. If new lands include issues not considered under this RMP or would exceed the impacts considered in the EIS, the BLM would undertake an RMP revision.

The BLM is developing this RMP with the assumption that the Coast Guard will complete the relinquishment of withdrawals affecting 189 acres and that these lands will come under BLM's jurisdiction (see page 1). Because this relinquishment is reasonably foreseeable (i.e., not certain, but the most likely outcome), the effects analysis assumes that these lands will be under the BLM's jurisdiction during the implementation of the plan. As a result, the addition of these lands will not exceed the impacts considered in this EIS.

Rights-of-Way and other Land-Use-Authorizations Objectives:

- Allow authorized uses of the landscape while minimizing impacts to Monument objects and values.

Rights-of-Way and other Land-Use-Authorizations Management Direction:

- In addition to uses allowed under other portions of the plan, allow the following uses of the Monument under all action alternatives:
  - Valid existing rights.
  - Emergency uses of the Monument, such as search-and-rescue operations, fire response, law enforcement actions, and response to oil spills or hazardous materials releases, including staging for cleanup operations. Entities undertaking such emergency actions must minimize impacts to ecological and cultural values when operating within the Monument.
  - Use, maintenance, repair, and replacement (including access for these purposes) by the Coast Guard and other U.S. Department of Homeland Security agencies of Patos Island Light Station, Turn Point Light Station, and other aids to navigation for navigational or national security purposes. Rights-of-way for these purposes would be allowed regardless of restrictions described in the action alternatives.

Alternative A

Rights-of-Way Management Objective:

- Administer rights-of-way while protecting Monument objects and values.

Rights-of-Way Management Direction:

- Consider rights-of-way applications that would meet the protective mandate of Proclamation 8947 on a case-by-case basis, including as provided under common to all action alternatives.

Land Tenure Management Direction:

- Designate all Monument lands as land tenure zone 1 (i.e., retain ownership of all Monument lands).

Alternatives B and D

Rights-of-Way Management Objectives:

- Administer rights-of-way while protecting Monument objects and values.

Rights-of-Way Management Direction:

- Designate the Monument as a right-of-way avoidance area.
  - Only consider right-of-way applications that would not impair Monument objects and values and as provided under the actions common to all action alternatives.
  - Do not consider applications for wind and solar energy projects or communications towers, as they are assumed to require substantial impacts to Monument objects given the small size of the individual locations that compose the Monument.

Land Tenure Management Direction:

- Designate all Monument lands acquired through land and water conservation funds as land tenure zone 1 (i.e., retain without the possibility of exchange land acquired through land and water conservation funds, including Watmough Bay, Chadwick Hill, and parts of Iceberg Point).
- Designate all remaining Monument lands as land tenure zone 2 (i.e., retain unless the BLM decides to participate in a land exchange that furthers the resource protection purposes of Proclamation 8947).

Alternative C

Rights-of-Way Management Objectives:

- Prohibit rights-of-way across the Monument except as provided under common to all action alternatives.

Rights-of-Way Management Direction:

- Designate the Monument as a right-of-way exclusion area, with exceptions for rights-of-way described under common to all action alternatives.

Land Tenure Management Direction (same as C and D):

- Designate all Monument lands acquired through land and water conservation funds as land tenure zone 1 (i.e., retain without the possibility of exchange land acquired through such funds, including Watmough Bay, Chadwick Hill, and parts of Iceberg Point).
- Designate all remaining Monument lands as land tenure zone 2 (i.e., retain land except consider exchanges that would further the resource protection purposes of Proclamation 8947).

Natural Material Collection

Background

Management direction restricting the collection of natural materials under the alternatives would not apply to collection by Coast Salish tribal members for spiritual or traditional uses or through the exercise of tribal treaty rights. See the Paleontological section for information on the collection of paleontological resources and the Science section for information on collection for scientific purposes.

See Appendix S for a summary table of the differences between the alternatives for natural material collection. For a description of the current status of natural material collection in the Monument see the section beginning on page 155 in Chapter 3.

No Action Alternative

The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions require members of the public to obtain permits to collect vegetation within these areas. There would continue to be no plan-level decisions related to natural material collection for Monument lands outside of the ACECs and the BLM could continue to manage natural material collection under the FLPMA and BLM Manual 5400-2.

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Manage collection of natural materials, such as rocks, firewood, driftwood, mushrooms, and edible, medicinal, and culturally important plants and seeds to ensure the protection of the Monument's ecological values.

Management Direction:

- Restrict public collection amounts and activities as necessary to protect the Monument's values.

- Require authorization from the Monument Manager for collection of natural materials related to research (see Science on page 32, below).
- Allow administrative collection of seed.
- Removal of trees would only be permitted to achieve objectives for habitats and vegetative communities (see Habitat and Plants on page 16, above).

Alternative A

Management Direction:

- Require free use permits for collection of natural materials. This requirement would not apply to collection for Coast Salish tribes' spiritual or traditional use or the exercise of treaty rights.
- Prohibit collection of natural materials for commercial purposes.

Alternative B

Management Direction:

- Require permits for non-commercial collection of natural materials. This requirement would not apply to collection for Coast Salish tribes' spiritual or traditional use or the exercise of treaty rights.
- Prohibit collection of all natural materials for commercial purposes.

Alternative C

Management Direction:

- Prohibit all non-scientific collection of natural materials. This prohibition would not apply to authorized research or Coast Salish tribes' spiritual or traditional use or the exercise of treaty rights.
- Work with interested Coast Salish tribes to develop a voluntary tribal government-based authorization and monitoring system for collection of materials for spiritual or traditional use or the exercise of treaty rights.

Alternative D

Management Direction:

- Require permits for non-commercial collection of natural materials. This requirement would not apply to collection for Coast Salish tribes' spiritual or traditional use or the exercise of treaty rights.
- Allow sustainable collection of natural materials for commercial purposes with a paid permit.
- Prohibit collection of natural materials for commercial purposes within areas that the BLM has identified as having wilderness characteristics (see Wilderness Characteristics on page 37, below).

Paleontology

Background

Proclamation 8947 identified paleontological resources as an object for which the Monument was designated. The BLM is currently aware of one paleontological resource locality within the Monument. It is likely that additional paleontological resources exist. The Approved RMP's objectives and direction would apply to any paleontological resources discovered within the Monument.

See Appendix S for a summary table of the differences between the alternatives for paleontological resources. For the current condition of paleontological resources see the section beginning on page 140.

No Action Alternative

There would continue to be no plan-level decisions related to paleontological resources. Casual collecting of common invertebrates and plant fossils would continue to be allowed throughout the Monument (16 USC 470aaa-3). Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management.

The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objectives:

- Protect important paleontological resources where they are found within the Monument.

Management Direction:

- Conduct proactive inventories to identify and document paleontological localities.
- Conduct on the ground inventories in areas where paleontological resources are likely to occur before authorizing implementation-level ground disturbing activities. Where important paleontological resources are found, modify project to avoid impacts.
- Fence and/or sign areas to reduce damage and allow for stabilization, repair, and recovery where human activity is causing substantial damage to paleontological resources.
- Prohibit collection of vertebrate or trace fossils for nonscientific purposes except by the BLM where they are threatened by natural or human activity.
- Require a free use permit for collection of common invertebrate and plant fossils.
- Allow shoreline stabilization using soft stabilization methods that employ primarily natural materials, such as live plants, logs, root wads, and vegetative mats where paleontological resources are in danger of being lost due to erosion.

Alternative A and C

Management Direction:

- Prohibit shoreline stabilization using hard shoreline stabilization methods, such as riprap.

Alternative B

Management Direction:

- Allow both hard and soft shoreline stabilization methods to protect paleontological resources.

Alternative D

Management Direction:

- Allow both hard and soft shoreline stabilization methods to protect paleontological resources, except in areas that have wilderness characteristics. Allow only soft stabilization and prohibit hard shoreline stabilization methods in areas that have wilderness characteristics (see page 37).

Partnerships

Background

Under all alternatives, the BLM would continue to collaborate and coordinate with governmental and non-governmental partners across the San Juan Islands. Given the dispersed nature of Monument lands, partnerships and collaboration are essential to achieving management objectives.

No Action Alternative

The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions direct the BLM to enter into a law enforcement agreement with the County Sheriff and enter into a Memorandum of Understanding with interested parties to implement the ACEC decisions. There would continue to be no other plan-level decisions related to partnerships. The BLM would, however, continue to maintain and develop partnerships related to the Monument.

Common to All Action Alternatives

Management Objective:

- Contribute to a collaborative approach to management across the San Juan Islands.

Management Direction:

- Coordinate and collaborate with Federal, Tribal, State, local, and non-governmental partners when undertaking projects to implement the plan.
- Develop assistance agreements, memoranda of understanding, and other mechanisms to facilitate resource sharing and shared goals and objectives.

Recreation and Visitor Services

Background

Proclamation 8947 does not identify recreation as an object or value for which the Monument was designated. It does describe continued human appreciation of the area: "These lands are a refuge of scientific and historic treasures and a classroom for generations of Americans." Recreation is a primary means by which the public can learn to appreciate the Monument's objects and values. It also has the potential to degrade the values that attract visitors to the Monument and the San Juan Islands in general.

Recreation is defined as the use of leisure time to freely engage in activities in a variety of settings that provide personal satisfaction and enjoyment. For the purposes of this planning effort, recreation does not include activities undertaken exclusively for educational, scientific, cultural, or spiritual purposes.

For the purposes of this planning effort, the BLM has divided the Monument up into 16 potential recreation management areas (RMAs) (Appendix O includes maps of the RMAs). In most cases, these areas are specific Monument locations (e.g., Watmough Bay, Cattle Point, etc.). These locations are scattered across the San Juan Islands and in many cases potential RMAs are not in close proximity to other Monument lands. The BLM has identified specific recreation objectives for RMAs for each alternative under which they would be designated along with allowable and prohibited uses that would be established in order to meet these objectives (see Appendix O). The BLM grouped smaller islands and rocks into categories based on shared management concerns. Rocks are distinguished from islands by their minimal vegetation and small size. In the event that the BLM acquires or identifies additional Monument lands, they would be managed within the most similar RMA. The 16 potential RMAs are:

- Cape Saint Mary (Lopez Island): approximately 2 acres
- Carter Point (Lummi Island): approximately 43 acres
- Category A Rocks[20]: a total of approximately 4 acres encompassing East Sound Blind Island South, Kanaka Bay Islands, King Islands, Massacre Bay Rocks, Richardson Rocks (2 smaller rocks), Trinka Rock, Unnamed Rock (WNW Kanaka Bay Island)
- Category B Rocks[21]: a total of approximately 6 acres encompassing Barnes Rocks, Blind Bay Island Rock, Carter Point Rocks, Chuckanut Rocks, Davis Bay Island and Rocks, East Sound Blind Island North, John's Island Rocks, John's Pass Rocks, Leo Reef, Lovers Cove Rocks, MacKaye Harbor Rocks, Mitchell Bay Rocks, Oak Island Rock, Outer Bay Rocks, Picnic Point Rocks, Prevost Harbor Rocks, Reid Harbor Rock, Reservation Bay Rocks, Rock Island, Satellite Island Rocks, Unnamed Rocks (Grandma's Cove), Unnamed Rocks (Iceberg Point Rocks), Unnamed Rocks (Jones Bay Rock), Unnamed Rocks (Pear Point and Danger Rocks), Unnamed Rock (Seal Rock), Unnamed Rocks (Shaw Island), Unnamed Rocks (South Lopez)
- Cattle Point (San Juan Island): approximately 23 acres
- Chadwick Hill (Lopez Island): approximately 294 acres
- Eliza Point (Eliza Point): approximately 4 acres

[20] Category A rocks have some known recreational use as of 2016 and generally have less sensitive resources than Category B rocks.

[21] Category B rocks have limited or no recreational use as of 2016 and generally have more sensitive resources than Category A rocks (this includes all rocks formally identified as marine mammal haul-outs).

- Iceberg Point (Lopez Island): approximately 97 acres
- Islands: a total of approximately 43 acres encompassing Blind Island, Broken Point Island, Fauntleroy Rock, Freeman Island, Indian Island, Little Patos Island, Lummi Rocks, McConnell Rocks, Mud Island, Oak Island, Park Bay Island, Posey Island, Reads Bay Island, Richardson Rocks, Skull Island, Twin Rocks, Victim Island
- Kellett Bluff (Henry Island): approximately 63 acres
- Lopez Pass (Lopez Island): approximately 1 acre
- Patos Island: approximately 211 acres
- Point Colville (Lopez Island): approximately 75 acres
- President Channel (Orcas Island): approximately 31 acres
- Turn Point (Stuart Island): approximately 86 acres
- Watmough Bay (Lopez Island): approximately 37 acres

See Appendix S for a summary table of the differences between the alternatives for recreation. The full details of each alternative's allowable and prohibited use decisions are in Appendix O. For current conditions related to recreation see the section beginning on page 145.

Note: Monument visitors must follow all pertinent laws protecting marine mammals and migratory birds.

No Action Alternative

The 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. These decisions prohibit fires, trail construction, and camping in these areas. They also require organized groups of 10 or more to obtain permits. There would continue to be no plan-level decisions on recreation outside of the ACECs. Most forms of recreation would continue to be allowed in the Monument, including non-motorized trail uses (hiking, equestrian, bicycling), camping (outside of the ACECs), and hunting with firearms and bows (in compliance with State and local regulations).

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis. There would continue to be no RMAs or recreation objectives; over time the impact from visitors could increase and the visitor experience in the Monument could change.

Common to All Action Alternatives

Management Objective:

- Protect Monument objects and values from loss due to visitation.

Management Direction:

- Develop interagency visitor facilities and materials in coordination with agency partners.
- Prohibit campfires near structures and sensitive resources.
- Minimize the impacts on dark night skies from all lighting installed within the Monument.
- Prohibit take-off and landing of manned aircraft except for administrative and emergency purposes (recreational use of unmanned aircrafts is addressed in Appendix O: RMA Frameworks).
- Prohibit use of fireworks on all Monument lands.
- Prohibit use of metal detectors by the public to avoid potential disturbance of cultural resources from digging associated with this activity.
- Prohibit placement of physical geocaches within Monument to avoid potential disturbance of cultural

resources from hiding and uncovering of caches associated with this activity (this would not affect geocaching with virtual caches).

- Undertake temporary closures as necessary to protect the Monument's ecological and cultural values, as well as sensitive tribal activities.

Alternative A

Under Alternative A, the BLM would facilitate use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. As a result, the BLM would not designate any of the potential RMAs under Alternative A and would prohibit recreation on Monument lands.

Management Objectives:

- Facilitate use of the Monument for scientific, educational, cultural, and spiritual uses.
- Minimize impacts to Monument objects and values from human use.

Management Direction:

- Issue written authorizations for research, educational, cultural, and spiritual uses of the Monument to the extent consistent with protecting its objects and values.
- Prohibit recreational use of Monument lands (including recreational boat landing).
- Do not issue competitive special recreation permits.

Alternative B

Under Alternative B, the BLM would designate all potential RMAs except Category A Rocks and Category B Rocks. The BLM would prohibit recreation on Category A Rocks and Category B Rocks. In order to provide opportunities for solitude and quiet, the Cape Saint Mary, Carter Point, Kellett Bluff, Lopez Pass, President Channel, and Islands RMAs would be open for recreation by permit only.

Management Objectives:

- Facilitate recreational use that is compatible with protecting Monument objects and values.
- Facilitate an experience of quiet and solitude.
- Provide hiking[22], picnicking, and camping opportunities within the Monument.

Management Direction:

- Do not issue competitive special recreation permits.
- Apply allowable and prohibited use decisions described in the RMA frameworks to meet RMA objectives in Appendix O. These decisions include:
    - Prohibit non-hiking travel (e.g., motorized, bicycle, and equestrian) within of Monument, except on existing roads (depicted the travel and transportation alternatives in Appendix H).
    - Require all visitors to stay on designated trails or on un-vegetated shoreline in travel management areas with designated trails (see Appendix H), except when gathering natural materials, hunting, or other authorized purposes.
    - Do not develop additional visitor facilities (e.g., benches, restrooms, parking areas). See the Education and Interpretation section beginning on page 14 for management direction addressing signs.
    - Allow existing designated site camping and dispersed, small group camping by permit in specified RMAs (see Appendix O).
    - Prohibit pets within the Monument in order to remove the possibility of wildlife disturbance and visitor conflict related to pets. This prohibition does not apply to service animals.

[22] For the purposes of this document, "Hiking" encompasses all forms of pedestrian recreational travel, including, but not limited to, walking for pleasure and exercise and trail running.

- Prohibit the launching and landing of unmanned aircraft (e.g., drones) for recreational purposes from Monument land.

Alternative C

Under Alternative C, the BLM would designate all potential RMAs except for Category B Rocks. The BLM would prohibit recreation, including recreational boat landing, on Category B Rocks.

Management Objectives:

- Facilitate recreational use that is compatible with protecting Monument objects and values.
- Provide hiking, picnicking, equestrian, biking, and camping opportunities within the Monument.

Management Direction[23]:

- Prohibit discharge of firearms[24]in the following areas (612 acres in total) *except* for half of modern firearm and muzzleloader deer hunting season[25]: Cattle Point, Chadwick Hill, Iceberg Point, Point Colville, Turn Point, and Watmough Bay. Work with the Washington Department of Fish and Wildlife (WDFW) annually to establish the period of time during which the prohibition would not apply.

  The areas identified for this prohibition are those about which the BLM has received public comments expressing concern about discharge of firearms.
- Do not issue competitive special recreation permits.
- Apply allowable and prohibited use decisions described in the RMA frameworks to meet RMA objectives in Appendix O. These decisions include:
  - Manage specified areas for trail-based equestrian travel, in addition to hiking.
  - Require all visitors to stay on designated trails or on un-vegetated shoreline in travel management areas with designated trails (see Appendix H), except for the purpose of gathering natural materials, hunting, or other authorized purposes.
  - Allow camping in existing designated sites.
  - Prohibit unleashed pets within the Monument in order to allow pets while minimizing wildlife disturbance and visitor conflict.
  - Require a permit for the launching and landing of unmanned aircraft (e.g., drones) by the public from Monument land[26].

Sub-Alternative C (same Recreation objectives and direction as Alternative C, except for the direction below)

Management Direction:

- Prohibit discharge of firearms within the Monument[24], except for use by Coast Salish tribal members for the purposes of hunting.

Alternative D

Under Alternative D, the BLM would designate all potential RMAs.

Management Objectives:

[23] Where a particular use is not prohibited on BLM-administered land it is generally allowed within the constraints of law and regulation, though may be subject to temporary closures for emergencies and public health and safety concerns.

[24] The firearm prohibition included in this alternative would not affect non-firearm-based hunting (e.g., bow hunting); it would also not apply to the use of firearms by Coast Salish tribal members for the purposes of hunting.

[25] This is similar to how hunting is managed at Lopez Hill, which is the only other public land on Lopez Island where hunting is currently allowed: https://lopezhill.org/hunting-on-lopez-hill/

[26] As is the case throughout the United States, all unmanned aircraft use must comply with Federal Aviation Administration laws and regulations (see www.faa.gov/uas)

- Facilitate recreational use that is compatible with protecting Monument objects and values.
- Provide hiking, picnicking, equestrian, biking, and camping opportunities within the Monument.

Management Direction:

- Apply allowable and prohibited use decisions described in the RMA frameworks in Appendix O. These decisions include:
  - Manage specified areas for equestrian and/or bicycle uses, in addition to hiking.
  - Manage for dispersed camping except on Category B Rocks, Twin Rocks, Victim Island, Watmough Bay, and areas managed for designated site camping. Manage designated site camping to support the Cascadia Marine Trail in specified RMAs. Specific locations of sites would be determined during plan implementation. The BLM would work with agency partners (including Washington State Parks) and the public to identify appropriate locations for these sites.
  - Prohibit unleashed pets within the Monument in order to allow pets while minimizing wildlife disturbance and visitor conflict.
  - Allow the launching and landing of unmanned aircraft (e.g., drones) by the public from Monument land[26].

Science

Background

Proclamation 8947 describes the Monument as a refuge for "scientific and historic treasures" and the lands that make it up as "some of the most scientifically interesting lands in the San Juan Islands."

For current conditions related to science within the Monument see the section beginning on page 33.

No Action Alternative

There would continue to be no plan-level decisions related to science. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management and continuing to allow scientific research to take place within the Monument to the extent compatible with the proclamation. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objectives:

- Facilitate scientific assessments, inventory, monitoring, research, and education that would enhance the understanding and protection of Monument objects and values.
- Facilitate opportunities for youth and citizen scientists to participate in the scientific assessments, inventory, monitoring, research, and education identified in the Monument science plan, which the BLM will develop after the publication of the Approved RMP.

Management Direction:

- Require written Monument Manager authorization for all scientific research projects, including any collection of materials from the Monument for scientific purposes.
  - Only approve authorizations where they comply with the RMP and applicable laws and regulations. Authorization may take a variety of forms, including a special use permit; an interagency, assistance, or cooperative agreement; an Archaeological Resources Protection Act permit; an Antiquities Act permit; a paleontological resource use permit; or other permit.
- Permit destructive sampling (i.e., procedures that cause permanent change to sampled material) of ecological and cultural values only when: a) sampling is the only viable method for the research and b) the research is expected to answer critical questions to benefit long-term protection of Monument

objects and values. Specify in the research authorization whether destructive sampling can occur, the amount of material that can be destroyed, and proper handling of any samples of human remains.

- Require Monument Manager approval for any physical installations for scientific purposes—such as data loggers and sensors.
- Require researchers to provide the BLM with an electronic copy of all final reports and scientific papers resulting from the research conducted within the Monument. The BLM may share research for public use, including in an online format.
- Require scientists to include a public outreach/education component in research projects, such as involving educators, students, or citizen scientists in research, as the Monument Manager deems appropriate.
- Encourage the use of established and reputable citizen science projects, such as data collection through bio-blitzes, citizen science apps, Christmas bird counts, and initiatives identified in the Federal Crowdsourcing and Citizen Science Toolkit and the Citizen Science Alliance.

Tribal Interests

Background

Native American/Indigenous Peoples have inhabited the region for more than 10,000 years, utilizing lands in the San Juan Islands for hunting, fishing, plant gathering, trade and exchange, and other cultural, social, and religious activities. Many of these activities occurred within what is now the Monument. The Coast Salish peoples continue to live in the San Juan Islands and surrounding areas and utilize the public lands and resources—including the Monument—that are part of their aboriginal territory and usual and accustomed use area.

Federally recognized tribes retain rights and/or interests in public lands through treaties, executive orders, and/or Federal statutes. Through treaties, Coast Salish tribes granted land and other natural resources to the United States while retaining all rights not expressly granted. The BLM, as a Federal land managing agency, seeks to provide healthy habitats and water quality for maintaining treaty resources and access to public lands for practicing treaty rights, including hunting, fishing, and gathering activities as provided by statute and executive order. Federal agencies must consider how their actions affect treaty rights for access to usual and accustomed places for fishing and to open and unclaimed lands for hunting and gathering, as well as the impacts of actions to the cultural and socioeconomic interests of all federally recognized tribes.

As noted in the legal obligations section on page 6, the BLM will meet all pertinent legal obligations in managing the Monument, including those related to Tribal treaties. Under all alternatives, the BLM will collaboratively engage with tribal partners to facilitate tribal activities within the Monument.

For current conditions related to tribal interests refer to the section beginning on page 215.

No Action Alternative

There would continue to be no plan-level decisions explicitly related to tribal interests. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective

- Collaboratively engage with tribal government partners.

Management Direction:

- Use temporary closures to facilitate sensitive tribal activities, traditional uses, and the exercise of treaty rights, or to avoid safety hazards potentially stemming from such tribal activities.
- Work with tribes to develop opportunities for co-stewardship of culturally-important plant communities and species.
- Work with tribes to develop opportunities for youth and elder engagement.
- Seek opportunities to work with tribal partners to research and restore original Coast Salish place names whether formally or informally (e.g., as subtitles on outreach materials).
- Maintain and improve access for exercise of treaty rights and traditional cultural practices.

Travel and Transportation

Background

Proclamation 8947 requires that, except for emergencies, Federal law enforcement, or authorized administrative purposes, motorized vehicle use only occur on designated roads and mechanized vehicle use (e.g., bicycles) only occur on designated roads and trails.

The designation of land as open, closed, or limited to public motorized vehicle use is a plan-level decision. The BLM is also undertaking implementation-level travel planning concurrent with the planning effort. This entails identifying roads and trails that would be available to the public under each alternative, as well as what modes of transportation the BLM would allow on these routes.

For the foreseeable future, the Coast Guard will maintain jurisdiction for a total of 17 acres surrounding three aids to navigation at Cattle Point, Iceberg Point, and Kellett Bluff. The Monument's current trail network crosses these areas at Cattle Point and Iceberg Point and the BLM provides some on-the-ground management. Because of this, the BLM is considering these trails in its travel and transportation planning with the intent of providing the Coast Guard with recommendations on the designation of these trails.

See the Recreation table in Appendix S for a summary of the differences between the alternatives for travel and transportation. For current conditions related to travel and transportation in the Monument, see the section beginning on page 145. See Appendix H for site-specific maps and road and trail details.

No Action Alternative

Proclamation 8947 would continue to require that public motorized use be restricted to designated roads and public mechanized vehicle use (e.g., bicycle use) be restricted to designated roads and trails under the No Action Alternative. The 1990 ACECs decisions also prohibit public motorized vehicle use off of roads and prohibits trail construction within the ACECs. There would continue to be no plan-level decisions related to travel and transportation outside of the ACECs. The existing road and trail network, much of which is composed of user created trails, would likely continue.

Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Manage travel within the Monument to facilitate uses allowed under each alternative and to protect Monument objects and values.

Management Direction:

- Designate the whole of the Monument (1,021 acres) as limited to designated roads for public motorized vehicle use (i.e., public motorized vehicle use would be restricted to designated roads).

- Limit bicycle and equestrian access to designated roads and trails within the Monument (note: the BLM would not designate trails for equestrian access under alternatives A and B and would not designate trails for bicycle access under alternatives A, B, and C).
- Select from best management practices for trail development and maintenance (Appendix F) to maintain water quality when conducting implementation-level projects.

Alternative A

Summary of Implementation-level Road and Trail Designation Decisions for Alternative A (see Appendix H for site-specific maps and road and trail details):

- Close 1 mile of existing road to public motorized access at Point Colville, Turn Point, and Watmough Bay. Maintain these roads for motorized administrative and authorized uses[27].
- Maintain non-motorized trails as necessary for administrative and authorized uses. These trails would be closed except for administrative or authorized uses.

Alternative B

Summary of Implementation-level Road and Trail Designation Decisions for Alternative B (see Appendix H for site-specific maps and road and trail details):

- Designate 1 mile of existing road for public motorized access at Point Colville, Turn Point, and Watmough Bay (roads would also continue to be open to all modes of non-motorized transportation).
- Designate a trail network that would disperse hiking across the Monument in order to provide opportunities for a more solitary visitor experience.
- Require all visitors to stay on designated trails or on un-vegetated shoreline in travel management areas with designated trails (see Appendix H), except for the purpose of gathering natural materials, hunting, or other authorized purposes.
- Designate 19.4 miles of trail for hiking[28]. The BLM would recommend that the Coast Guard maintain 0.9 miles of trail for hiking.
- Close approximately 1.1 miles of existing user created trails. The BLM would recommend that the Coast Guard close 0.2 miles of existing trail.

Alternative C

Summary of Implementation-level Road and Trail Designation Decisions for Alternative C (see Appendix H for site-specific maps and road and trail details):

- Designate 0.6 miles of existing road for public motorized access at Turn Point and Watmough Bay (roads would also continue to be open to all modes of non-motorized transportation).
- Close 0.4 miles of road to public motorized access at Point Colville and Turn Point (west of the parking area). Maintain these road segments for administrative and authorized uses[27](these road segments would also continue to be open to all modes of non-motorized transportation).
- Designate the minimum trail network to provide for hiking access and equestrian opportunities.

[27] Authorized users would include the Coast Guard for the use, maintenance, repair, and replacement of aids to navigation and owners of private lands that can only be accessed via BLM-administered road at Point Colville.
[28] For the purposes of this document, "Hiking" encompasses all forms of public pedestrian recreational travel, including, but not limited to, walking for pleasure and exercise and trail running.

- Require all visitors to stay on designated trails or on un-vegetated shoreline in travel management areas with designated trails (see Appendix H), except when gathering natural materials, hunting, or other authorized purposes.
- Designate 11.3 miles of trail for hiking.[29] The BLM would recommend that the Coast Guard maintain 0.7 miles of trail for hiking.
- Designate 2.6 miles of trail for equestrian use (all but 0.2 miles would be closed to equestrian use during the wet season[30]).
- Close 3.6 miles of current user created trails. The BLM would recommend that the Coast Guard close 0.4 miles of existing trail.

Alternative D

Summary of Implementation-level Road and Trail Designation Decisions for Alternative D (see Appendix H for site-specific maps and road and trail details):

- Designate 0.9 miles of road for public motorized access at Point Colville, Turn Point, and Watmough Bay (all modes of non-motorized public transportation would be allowed on these roads).
- Close 0.1 miles of road to public motorized access at Turn Point (west of the parking area). Maintain these road segments for administrative and authorized uses (this road segment would also continue to be open to all modes of non-motorized transportation).
- Designate a trail network to provide expanded opportunities for recreation within the Monument while still protecting its objects and values.
- Designate 23.5 miles of trail for hiking. The BLM would recommend that the Coast Guard maintain 1.2 miles of trail for hiking.
- Designate 8 miles of trail for equestrian use (7.6 miles of which would be closed to equestrian use during the wet season[30]). The BLM would recommend that the Coast Guard maintain 1.2 miles of trail for equestrian use (all 1.2 miles would be closed to equestrian use during the wet season[30]).
- Designate 8 miles of trail for bicycle use (7.7 miles of which would be closed to equestrian use during the wet season[30]). The BLM would recommend that the Coast Guard maintain 0.4 miles of trail for bicycle use (0.3 miles of which would be closed to equestrian use during the wet season[30]).
- Close 3.6 miles of current user created trails. The BLM would recommend that the Coast Guard close 0.4 miles of existing trail.

Visual Resources Management

Background

The BLM sets visual resource management (VRM) objectives to establish the maximum allowable level of contrast that a project can introduce to a particular landscape[31]. The BLM would work with the Coast Guard to ensure that use, maintenance, repair, and replacement (including access for these purposes) of aids to navigation in the Monument are accomplished while meeting visual resources objectives. See the Visual Resources section in Appendix E for information on how the BLM inventories and plans for visual resources.

See Appendix S for a summary table of the differences between the alternatives for visual resources. For the Monument's current visual resources inventory see the section beginning on page 225.

[29] This includes rerouting a trail at Iceberg Point around a population of white-topped aster, a BLM sensitive plant.
[30] The period of the seasonal closure would be based on BLM monitoring and could vary from year to year.
[31] Projects have five years to conform to VRM objectives, e.g., a project to stabilize a structure could require machinery that would temporarily create substantial visual contrast. As long as this impact is removed within five years the project can still conform to restrictive VRM classes.

No Action Alternative

There would continue to be no plan-level decisions related to VRM. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Maintain or improve the current quality of visual resources within the Monument except where doing so would conflict with conserving, protecting, or restoring Monument objects and values.

Alternative A

Management Direction (See Map 3 on page 230 of Chapter 3):

- Manage areas managed for their wilderness characteristics under this alternative (232 acres) as VRM Class I.
- Manage all other areas (789 acres) as VRM Class II.

Alternative B[32]

Management Direction (See Map 4 on page 230 of Chapter 3):

- Manage maritime heritage areas (28 acres) as VRM Class II.
- Manage all other areas (992 acres) as VRM Class III to allow for extensive vegetation restoration. While such projects would not necessarily impair the Monument's overall scenery, they would heighten visual contrast with the characteristic landscape and the BLM assumes that they would need to be repeated more than once every 5 years in order to meet the vegetation management objectives.

Alternative C[32]

Management Direction (See Map 5 on page 231 of Chapter 3):

- Manage lands managed for their wilderness characteristics under this alternative (3 acres) as VRM Class I.
- Manage maritime heritage areas (28 acres) as VRM Class II.
- Manage all other areas (989 acres) as VRM Class III to allow for extensive vegetation restoration. While such projects would not necessarily impair the Monument's overall scenery, they would heighten visual contrast with the characteristic landscape and the BLM assumes that they would need to be repeated more than once every 5 years in order to meet the vegetation management objectives.

Alternative D

Management Direction (See Map 3 on page 230 of Chapter 3):

- Manage lands managed for their wilderness characteristics under this alternative (232 acres) as VRM Class I.
- Manage all other areas (789 acres) as VRM Class II.

Wilderness Characteristics

Background

There are no designated wilderness or wilderness study areas within the Monument. The BLM is required to inventory Bureau-administered lands to identify those that have wilderness characteristics and are not designated as wilderness or wilderness study areas. Through planning processes, the BLM determines whether or not to manage such lands for their wilderness characteristics. Other than where

[32] VRM designations for alternatives B and C total only 1,020 acres due to a rounding issue (i.e., the acres falling into two of the classes round down instead of up while under other alternatives the acres round up).

they conflict with the alternatives below, objectives and direction described elsewhere in this chapter apply to areas managed for their wilderness characteristics.

See the Wilderness Characteristics section in Appendix E for information about the wilderness characteristics inventory process.

See Appendix S for a summary table of the differences between the alternatives for wilderness characteristics. For a description of current wilderness characteristics within the Monument see the section beginning on page 231.

Lands managed for their wilderness characteristics would be available for Coast Salish tribes' spiritual or traditional use or the exercise of treaty rights.

No Action Alternative

There would continue to be no plan-level decisions related to wilderness characteristics. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Manage lands with wilderness characteristics for these characteristics except where doing so would conflict with management to conserve, protect, or restore Monument objects and values.

Alternative A

Management Direction:

- Manage all approximately 232 acres of land found by the BLM to have wilderness characteristics for these characteristics (see Map 6 on page 232 of Chapter 3).
    - Manage these lands as VRM I.
    - Other decisions that apply to the Monument as a whole within this alternative would also protect wilderness characteristics, such as minimizing vegetation treatments and not developing signs and visitor facilities (such as vault toilets) except as necessary to protect Monument objects and values and human health and safety.

Alternative B

The BLM would not manage any lands for their wilderness characteristics under Alternative B. Under Alternative B, the BLM would allow hard shoreline stabilization to protect cultural resources from erosion. This type of stabilization would preclude the protection of wilderness characteristics.

Alternative C

Management Direction:

- Manage all rocks (totaling approximately 3.2 acres) found by the BLM to have wilderness characteristics for these characteristics (i.e., areas that are unlikely to be subject to repeated intensive vegetation restoration efforts) (See Map 7 on page 234 of Chapter 3).
    - Manage these lands as VRM I.
    - Prohibit signs, except as necessary to protect Monument objects and values and human health and safety, and structures (e.g., vault toilets) on lands managed for their wilderness characteristics.
    - Other decisions that apply to the Monument as a whole within this alternative would also protect wilderness characteristics, such as making the Monument a rights-of-way avoidance area and prohibiting hard shoreline stabilization.

Alternative D

Management Direction:

- Manage all approximately 232 acres of land found by the BLM to have wilderness characteristics for these characteristics (see Map 6 on page 232 of Chapter 3).
  - Manage these lands as VRM I.
  - Prohibit collection of natural materials for commercial purposes within these lands.
  - Prohibit signs, except as necessary to protect Monument objects and values and human health and safety, and structures (e.g., vault toilets) on lands managed for their wilderness characteristics.
  - Prohibit the use of hard shoreline stabilization methods.
  - Other decisions that apply to the Monument as a whole within this alternative would also protect wilderness characteristics, such as making the Monument a right of way avoidance area.

Wildfire Response

Background

BLM policy, rather than plan decisions, dictate the majority of the BLM's wildfire response process. Through the planning process, the BLM can determine where naturally ignited wildfires may be managed for resource objectives and whether any restrictions on fire management practices are needed, such as the use of chemical fire retardants and foam.

See Appendix S for a summary table of the differences between the alternatives for wildfire response. For current conditions related to wildfire see the section beginning on page 236.

No Action Alternative

There would continue to be no plan-level decisions related to wildfire response. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- During wildfire response, minimize risks to human health and safety, property, infrastructure (including Coast Guard facilities), and Monument resources and values.

Management Direction:

- Suppress all human-caused wildfires.
- Use minimum impact suppression techniques (MIST) in all wildfire responses. MIST guidelines are established by the National Interagency Fire Center and are available at: www.nifc.gov/PUBLICATIONS/redbook/2003/AppendixU.pdf

Alternative A

Management Direction:

- Allow natural wildfire dynamics within the Monument to the extent that they do not threaten human life or safety, private property, infrastructure (including Coast Guard facilities), or historic structures.

Management Direction:

- Prohibit suppression of naturally ignited wildfires where they do not threaten human life or safety, private property, infrastructure (including Coast Guard facilities), or historic structures.
- Prohibit use of aerial and ground-based fire chemicals (retardant, foam, or other surfactants).

Alternatives B, C, and D

Management Objectives:

- Minimize wildfire risks to human life or safety, private property, infrastructure (including Coast Guard facilities), and historic structures.

Management Direction:

- Allow aerial delivery of fire chemicals (retardant, foam, or other surfactants) to protect human health and safety, property, and infrastructure (including Coast Guard facilities) on the Watmough Bay-Chadwick Hill-Point Colville parcel only.
- Allow ground delivery of fire chemicals on all other parcels provided these chemicals could be kept out of surface waters (fresh and salt).

Wildlife and Fish

Background

Proclamation 8947 addresses both the diversity of habitats within the Monument and the varied wildlife that depend on them. The BLM generally manages the habitat within which wildlife occurs, but does not directly manage wildlife. The BLM coordinates closely with State (WDFW) and Federal (U.S. FWS and NOAA Fisheries) partners that do manage wildlife. The BLM also closely coordinates with tribal governments on actions that would affect wildlife within the Monument. Many tribal governments take an active role in the management of wildlife in Washington State.

See Appendix S for a summary table of the differences between the alternatives for wildlife. For current conditions related to wildlife, see the section beginning on page 247.

No Action Alternative

There would continue to be no plan-level decisions related to wildlife. Under the No Action Alternative, the BLM would continue to take actions as necessary to meet law, regulation, and policy to the extent compatible with Proclamation 8947. This would include continuing to meet basic stewardship responsibilities through custodial management. The BLM would make decisions about taking actions on a case-by-case basis after completing the appropriate level of NEPA analysis.

Common to All Action Alternatives

Management Objective:

- Manage habitats within the Monument such that those habitats contribute to providing for populations of native wildlife species within the San Juan Islands.
- Maintain vulnerable species and habitat components in functional BLM ecosystems.
- Prevent a need for species listing under the Endangered Species Act.

Management Direction:

- See Habitat and Plants beginning on page 16.
- Work with State and Federal agencies to provide habitat for self-sustaining wildlife populations.

Alternative A

Management Direction:

- No specific direction—follow common to all and do not initiate and/or work with other agencies on wildlife augmentation, reintroduction, or control.

Alternatives B, C, and D

Management Direction:

- Work with appropriate agencies to augment or reintroduce populations of locally important wildlife species (e.g., federally listed or candidate species, state listed species, etc.).
- Work with appropriate agencies to control or eradicate species that are adversely affecting Monument objects and values.
    - This may include coordinating with the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) and/or other agencies to control or eradicate wildlife of management concern (invasive and/or nonnative wildlife).

Chapter 3: Affected Environment and Effects Analysis

Introduction

This chapter describes the existing conditions that the Approved RMP would be likely to affect (i.e., the affected environment) and the varying consequences of the alternatives. The BLM has combined these two topics into this chapter to provide all of the relevant information on a resource in a single discussion.

This chapter includes sections on each resource that the Approved RMP is likely to affect. Each section includes one or more subsections that address a particular question about how the alternatives would affect the resource (the BLM refers to these questions as analytical issues). Under each issue, the BLM describes the status and trends of the pertinent resource and then answers the question by describing the consequences of the alternatives—including the No Action Alternative—to the resource in detail.

The Council on Environmental Quality's NEPA regulations direct that "NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1[b]). Issues are "truly significant to the action in question" if they are necessary to make a reasoned choice between alternatives (i.e., the issue relates to how the alternatives respond to the purpose and need). Issues are also "truly significant to the action in question" if they relate to significant direct, indirect, or cumulative impacts of the alternatives. For this analysis, each section identifies the issues that are "significant to the action in question" and focuses the analysis on those issues.

Given the current lack of an RMP, the BLM analyzed the No Action Alternative as the continuation of existing management trends. For example, the BLM assumes that it would continue not to use herbicides for vegetation management because it does not currently use herbicides within the Monument. While the BLM could change this through appropriate planning and NEPA compliance, it analyzed continuation of the current approach as the most reasonably foreseeable outcome of the No Action Alternative.

Analytical issues considered but not analyzed in detail are found in Appendix A.

Air Quality

Key Points

- All alternatives would protect human health and the environment by maintaining air quality according to National Ambient Air Quality Standards.

This section contains one analytical issue:

1. How would the alternatives affect levels of particulates (PM2.5 and PM10) and ozone in the planning area? (Page 41)

Air Quality Analytical Issue 1: *How would the alternatives affect levels of particulates (PM2.5 and PM10) and ozone in the planning area?*

See Appendix B for analytical methods used in this analysis. See the Air Quality section in Appendix E for background information related to air quality.

Affected Environment

Air quality in the Pacific Northwest is relatively good, in part due to the influence of clean air from above the Pacific Ocean (Eilers et al. 1994). The San Juan Islands are located in the Puget Sound/Georgia Basin airshed, which is influenced by air pollutants from Seattle, Washington, and Vancouver, British Columbia (Canada), particularly from the transportation sector (Environment Canada and EPA 2014). Despite the region's growing population, emission reductions have occurred in the region since the mid-1980s (Environment Canada and EPA 2005). These reductions are attributed largely to initiatives by regional U.S. and Canadian air quality agencies. Population growth may threaten these air quality improvements

in the future (Environment Canada and EPA 2005). As Asia continues to develop, the transport of pollution from that region is also a rising concern (Jaffe et al. 2003).

Large pollution sources that may affect air quality in the San Juan Islands include a large pulp mill in Port Townsend and an aluminum smelter and two petroleum refineries near Bellingham. Despite these pollution sources, the most recent published comprehensive three-year inventory of air emissions indicates that the San Juan Islands rate among the lowest counties in Washington State for the production of particulates ($PM_{2.5}$ and PM_{10}) and pre-cursors to ground-level ozone (NOx and VOC) (WDOE 2011a).

As reported in the Washington State 2011 County Emissions Inventory (WDOE 2011a), sources of air pollutants in San Juan County are few and are predominately from vehicles on public roadways, non-road mobile equipment (e.g., agricultural, recreational and construction equipment), aircraft, woodstoves and fireplaces, residential outdoor burning, and natural emissions from soil and vegetation. See Table E-1 in the Air Quality section of Appendix E for sources and amounts of emissions in San Juan County.

There are few current activities associated with the Monument that could affect air quality. Motorized vehicle use by visitors and staff occurs on 1 mile of BLM-administered road. Staff, volunteers, and visitors also use cars and motorboats on non-BLM administered roads and waters to reach Monument lands. San Juan County is not a designated non-attainment or maintenance area for particulates or ozone.

The primary pollutants associated with current and potential BLM management are particulate matter ($PM_{2.5}$ and PM_{10}) and ozone. Ozone is not emitted directly but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC), which are generated by sources including motor vehicle exhaust, gasoline vapors, and chemical solvent (EPA 2015a).

Emissions from motorized vehicles are the leading source for NOx and the leading anthropogenic source of VOC in both Washington State (WDOE 2017) and San Juan County. Wildfires and prescribed fires also emit NOx and VOC that react to form ozone within the fire plume. The models typically used to estimate NOx and VOC emissions from wildland fires lack the sensitivity for a meaningful characterization of changes in surface-level ozone for the small amounts of ozone precursor emissions produced by small scale prescribed fires, such as are currently taking place in the San Juan Islands (Baker et al 2016; Nolte et al. 2015). The highest levels of ozone occur during summer while the greatest activity for prescribed burning is during spring and fall.

Sources of both coarse ($PM_{2.5}$) and fine (PM_{10}) particular matter include motor vehicle exhaust, wildland fire, and dust from roads and construction (EPA 2015b). The leading sources of $PM_{2.5}$ in Washington State are home heating devices such as woodstoves and fireplaces (WDOE 2011a). In San Juan County, home heating devices contribute about 31 percent of the $PM_{2.5}$ emissions; residential outdoor burning (19 percent) and paved and unpaved road dust (13 percent) are also major contributors (WDOE 2011a). The leading sources of PM_{10} in San Juan County are road dust and construction dust, which contribute 62 percent of the county's total emissions (WDOE 2011a).

Prescribed burn emission reporting to the Washington Department of Natural Resources (WDNR) for San Juan County indicates that private landowners are the largest contributors of particulate emissions. Some prescribed burning also occurs on Federal and State lands. Since 1987, the Nature Conservancy has periodically used prescribed burning at its Yellow Island preserve to minimize invasive species and enhance the long-term viability of native plant communities. The National Park Service implements prescribed fires on San Juan Island to meet similar objectives. Prescribed fires on Federal and State lands are conducted in accordance to Washington State's Smoke Management Plan (WDNR 1993).

Air pollution from wildfire in the region can affect the Monument and the broader San Juan Islands. The frequency of fires within the region could increase due to global climate change, changes in plant communities, and increases in visitation.

Effects of the Alternatives

Effects to air quality would vary little among alternatives. The variation that would occur would be due to the differences in the extent of prescribed burning the BLM would undertake under each of the alternatives (Table 4, Figure 1). Models that characterize emissions of ozone precursors lack the sensitivity to characterize differences from sources as small as the acres the BLM estimates it would burn under the alternatives (See Habitat and Plants Issue 3). NOx and VOC emissions from motor vehicle activities, campfires, and equipment usage would not vary between alternatives to a detectable degree. The BLM assumes that more ozone precursor emissions would be produced in alternatives that implement prescribed fire and pile burning but these emissions would likely not be detectable beyond the site and would quickly disperse.

Under all alternatives, the BLM would work with partners to suppress any human caused, unplanned ignitions in the Monument and adhere to Washington State Smoke Management Plan to meet the requirements of the Washington Clean Air Act (RCW 70.94), Forest Protection laws (RCW 76.04), and the United States Clean Air Act (42 USC 7401 et seq.). Under Alternative A, the BLM would only suppress naturally ignited wildfires where they threaten human life or safety, private property, infrastructure, or historic structures. Under all other action alternatives, the BLM could use naturally ignited wildfires to achieve management objectives in parts of the Monument. However, wildland fires of natural origin occur very rarely in the San Juan Islands, so the effect of these decisions on air quality would likely be minimal under all alternatives.

No Action Alternative

Under the No Action Alternative, the BLM assumes it would continue not to conduct prescribed burning in the Monument. The BLM would work with partners to suppress any fire occurring in the Monument.

Alternative A

Under Alternative A, the BLM would not implement prescribed burning in the Monument and would therefore not have any additional emissions or appreciable effects to air quality.

Alternative B, C and Sub-C

Alternatives B and C, along with Sub-Alterative C, include ambitious vegetation management objectives. The BLM estimates that a suite of treatments (see Habitat and Plants Issue 3), including prescribed fires, would be implemented to achieve these objectives. This would result in approximately nine emission producing events over 20 years for each alternative (Table 4). Ozone precursor emissions would increase compared to the No Action Alternative from prescribed fire activities but would be undetectable beyond the site scale. Appreciable differences in ozone emissions between alternatives that implement prescribed fire and pile burning would be difficult to measure and are unlikely to be substantial.

Particulate emissions from prescribed fire can be modeled (Table 4, Figure 1) but are unlikely to be detectable at a regional level and would disperse quickly. Prescribed fire activities would occur in the spring and fall where weather systems are more likely to quickly disperse emissions and background levels of particulates and ozone precursors are lower. Alternative C and Sub-Alternative C would produce approximately 60 percent more emissions than Alternative B over nine emission producing events over 20 years; these events would include broadcast burning and pile burning.

Alternative D

Under Alternative D, the BLM's objective would be to maintain the current extent and condition of the Monument's plant communities. The implementation of Alternative D would result in the lowest emissions of any action alternative that includes prescribe fire or pile burning. Alternative D would implement approximately seven emissions producing events that would produce about 17 percent of the emissions of Alternative C and Sub-Alternative C and approximately 30 percent of the emissions of Alternative B over a 20-year period due to more restricted restoration objectives. While the modeled emissions for Alternative D indicate substantial reductions in comparison to alternatives B, C, and Sub-C,

differences in emissions would not likely be measurable beyond the site scale. This is because smoke from pile burning typically disperses within between 8 and 24 hours depending on the size of piles and the size of piled material. Smoke from prescribed fire activities in grass-dominated areas typically disperse within 4 hours but could take longer if weather conditions conducive to long-term burning persist or in areas with higher coarse fuel loading.

Conclusion

The BLM's management of the Monument would have the least impacts on air quality under the No Action Alternative and Alternative A, due to the continued lack of prescribed fire. Alternative C and Sub-Alternative C would have the largest impact on air quality through $PM_{2.5}$, PM_{10}, and ozone emissions followed by Alternative B and Alternative D. As described above, effects on air quality from prescribed fire in the Monument would be unlikely to be detected at a regional scale and would disperse quickly.

Table 4: Estimated composite particulate emissions over 20 years by alternative

Particulate Emissions	No Action Alternative (tons)	Alternative A (tons)	Alternative B (tons)	Alternative C (tons)	Sub-Alternative C (tons)	Alternative D (tons)
$PM_{2.5}$ from Rx Fire	0	0	37	37	37	1
PM_{10} from Rx Fire	0	0	49	49	49	2
$PM_{2.5}$ from Pile Burning	0	0	84	168	168	35
PM_{10} from Pile Burning	0	0	96	192	192	40
$PM_{2.5}$ Total	**0**	**0**	**121**	**207**	**207**	**169**
PM_{10} Total	**0**	**0**	**145**	**241**	**241**	**42**

Total emissions would be distributed over the approximate number of burning events (entries) by alternative over 20 years (Alternative A = 0, Alternative B = 9 entries, Alternative C = 9 entries, Alternative Sub-C = 9 entries, Alternative D = 7 entries)

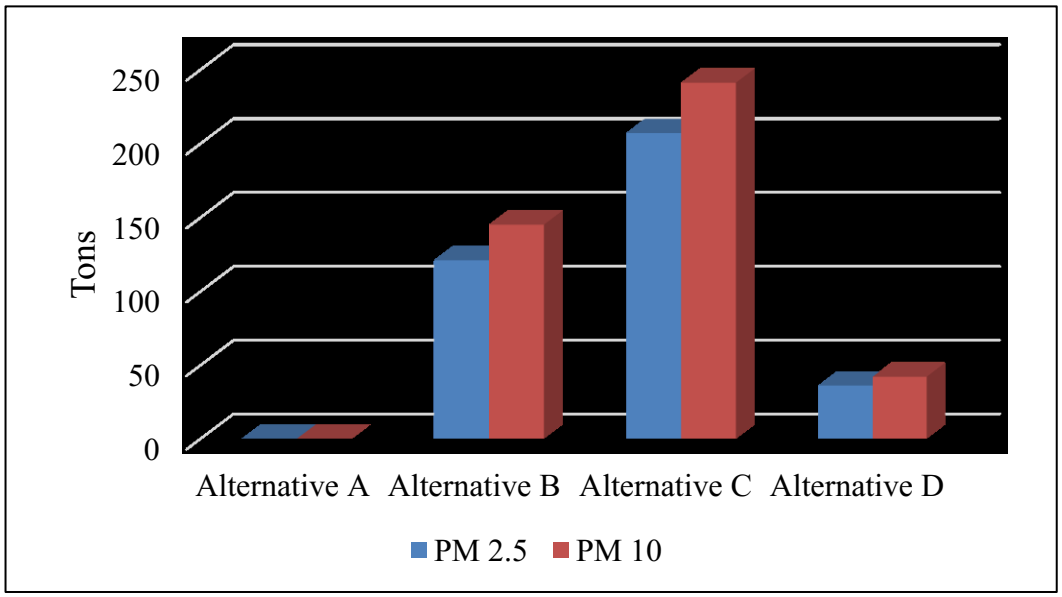


Figure 1: Estimated composite particulate emissions from prescribed fire over 20 years by alternative

Cumulative Effects of the Alternatives on Air Quality

As described in the affected environment section, air quality in the San Juan Islands is relatively good and has improved through emissions reductions since the mid-1980s. Prescribed fire is not a primary contributor to emissions in the San Juan Islands. The BLM's management of the Monument would continue to contribute negligibly to $PM_{2.5}$, PM_{10}, and ozone emissions under the No Action Alternative and Alternative A. Under alternatives B, C, Sub-C, and D, the BLM's emissions would increase relative to current conditions but would continue to disperse quickly and be unlikely to be detectable at a regional scale. When combined with existing emissions in San Juan County and the surrounding area, the contribution of emissions from activities in the Monument from any alternative would not be large enough to lead to the non-attainment of any National Ambient Air Quality Standard.

Climate Change

Key Points

- Alternatives B, C, and Sub-C would provide the BLM with the greatest ability of the alternatives to adapt to potential ecological effects associated with climate change.

This section contains one analytical issue:

1. What opportunities would the alternatives provide to respond to the effects of climate change? (Page 45)

Background

The BLM prepared a specialist's report comparing the extent of carbon stored within the Monument and greenhouse gas emissions associated with management under each alternative, as well as the extent to which the alternatives would support Washington State's greenhouse gas emissions and adaptation strategies. This report is incorporated here by reference and is available upon request, and its conclusions are summarized below.

The analyses described in the BLM specialist's report determined that Alternative C and Sub-Alternative C would emit the most greenhouse gases from BLM management actions among the alternatives, largely due to the frequency of vegetation treatments, including prescribed fire. Alternative A would emit the least greenhouse gases of any action alternative. All alternatives would result in a less than 0.25 percent increase in statewide emissions originating from other prescribed burning and vegetation management actions. These analyses also found that Alternative B would result in the least aboveground carbon storage within the Monument of any alternative, although this would be only slightly less than Alternative C and Sub-Alternative C. These alternatives would reduce carbon storage in San Juan County by less than 1 percent. Because of the small size of the Monument's potential contribution to both greenhouse gas emissions (<0.25 percent increase in statewide emissions from relevant categories) and carbon storage (<1 percent reduction in carbon storage in the county) relative to the surrounding area, the BLM has determined that these impacts are not likely to be significant. In other words, the intensity of the impacts from the alternatives to greenhouse gas emissions and carbon storage, in the context of the planning area as well as larger geographic contexts, would be low. Greenhouse gas emissions from BLM management actions are expected to increase by the greatest amount under alternatives B and C while carbon storage within the Monument would decline. However, alternatives B and C would also provide the BLM with the greatest ability of the alternatives to adapt to potential ecological effects associated with climate change, and the level of active management allowed under these alternatives would provide the greatest support for Washington State's climate change adaptation strategy.

Climate Change Analytical Issue 1: *What opportunities would the alternatives provide to respond to the effects of climate change?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Over time, climate change will likely place Monument objects and values at greater risk of loss or damage, particularly shoreline-based resources and plant community species composition and structure. Since analyzing potential impacts to all plant species considered a Monument object or value would be very difficult, the BLM analyzed potential impacts to camas and Garry oak as representative species of interest. Based on the literature, BLM expects that climate change would disfavor camas productivity and favor Garry oak extent and productivity. The analysis below evaluates whether and to what degree each alternative provides opportunities to maintain or enhance camas and Garry oak populations and productivity.

See the Climate Change section in Appendix E for background on the San Juan County climate.

Effects of the Alternatives

The risks posed to Monument objects and values from climate change are largely independent of the different alternatives. The alternatives vary in the ability of the BLM to respond to these risks through active management and vegetation and cultural resource management. The effects discussed are largely cumulative effects of actions the BLM would take over the life of the plan, particularly with respect to vegetation since they represent a trajectory for the communities or species arising from the possible interaction of management actions with changing climate.

Common to All Alternatives

Sea level rise would affect the size of the Monument as smaller and lower rocks and islands fall below mean high tide. Non-native plants present in the Monument that are not currently considered invasive may become so as climate change makes conditions more favorable (Dukes and Mooney 1999, Hellmann et al. 2008, Hoover et al. 2014); however, some existing invasive plants may become less invasive (Bradley et al. 2009, Bradley and Wilcove 2009). Given the current state of the science, the BLM cannot predict whether and how any plant's invasive capabilities may change.

Climate change decreases the likelihood that the BLM can achieve its management objectives, regardless of which alternative is implemented. Because natural variability remains a part of climate and ecosystem responses, changes will not be linear or at a steady rate (IPCC 2013, 2014).

No Action Alternative

Under the No Action Alternative, the BLM would continue its current custodial management of the Monument, including only undertaking an estimated 20 acres each year of invasive plant control using cutting only. Under this alternative, the BLM likely would continue to undertake soft stabilization of the shoreline to protect cultural resources; while the BLM has not undertaken hard stabilization as of the date of this document, it could occur where high value resources are in imminent risk of loss and soft stabilization measures would be ineffective.

With minimal active management, plant community change would continue in the current direction. Disturbances such as windstorms, insect outbreak or wildfire or interactions between one or more disturbances and drought would likely result in sudden shifts in plant communities (Allen et al. 2010, Clark et al. 2014, Peterson et al. 2014). Mature plants, such as trees, typically tolerate a wider range of climate conditions than seedlings, allowing them to persist under conditions that do not permit regeneration (Bell et al. 2014). Should a major event result in high mortality of trees, the site potential may shift from one general vegetation type to another, such as from woodland to savanna. Species composition may change from ones that are less drought tolerant to ones that are more drought tolerant. Because detailed information on probable rates of climate and vegetation change does not exist, the BLM does not know whether such shifts could or would occur over the expected life of the plan.

Changing climate would likely favor the continued spread of invasive plants, particularly for species that the BLM has not generally treated in the Monument. The success of the limited control measures taken might change. Depending on exactly how climate change plays out in specific sites, the combination of

changing temperature and precipitation regimes and increasing atmospheric CO_2 concentrations could accelerate the spread of some invasive species, such as annual grasses. Nonnative species currently present, but not considered invasive, may become invasive over the expected life of the plan. The combination of spreading invasive plants in conjunction with climate change would likely disfavor camas and Garry oak, even though changing climate alone would be expected to favor Garry oak. Both camas and Garry oak may be able to persist on shallow soils, but the productivity of both would be less. Garry oak growth form may also change from a tree to brush under certain site conditions.

Active management under this alternative would continue to be negligible, affording no opportunities to apply adaptive measures to reduce the potential impacts of climate change.

Alternative A

Under Alternative A, the BLM would minimize active management, while allowing treatments when identified thresholds in plant communities are crossed. Assuming climate change has no discernable impact, the BLM estimates that only treatment of invasive species would be necessary over the expected life of the plan although the allowable methods are limited. The BLM would allow soft shoreline stabilization to protect cultural sites, though it would prohibit hard shoreline stabilization. Since active management would be minimal, the probable effects of climate change on plant community changes, camas, and Garry oak would likely be very similar to the No Action Alternative. However, if climate change accelerates plant community shifts, then more active management than estimated in this Draft RMP/EIS may be necessary to maintain some plant communities, with the highest probability of change likely to be in moist forest. It is also likely that such management could fail to restore moist forest due to the changed conditions.

The BLM estimates that some additional control of invasive plants would occur under Alternative A, but the restrictions on methods (i.e., chemical treatments and prescribed fire would be prohibited) in combination with changing climate would likely reduce the treatment effectiveness. Whether the spread of invasive plants would be less under Alternative A than under the No Action Alternative is not clear, but there would likely be little noticeable difference. Soft shoreline stabilization would likely provide temporary protection to cultural sites, but the duration and effectiveness of such measures is not known, especially given the recent identification of accelerating rates of sea level rise. The BLM would not expect soft shoreline stabilization to result in shifting wave energy to adjoining lands.

Active management under this alternative would be very limited, providing few opportunities to apply adaptive management to reduce the risks of undesirable outcome arising from climate change. The alternative would allow for management once the extent of a given major plant community type falls below specified thresholds, which may or may not occur over the expected life of the plan. The analysis assumes that action would be necessary only to reduce invasive plants; however, the BLM lacks the necessary data and scientific tools to incorporate climate change into successional models to know whether any other major plant community type would fall below identified thresholds. The restrictions on management methods further limit the BLM's ability to take adaptive actions.

Alternative B

Under Alternative B, the BLM would actively manage vegetation to maintain or enhance the ecological resistance to change and resilience from disturbance. The BLM would allow the use of all vegetation management methods to meet the alternative's objectives; it would also allow both hard and soft shoreline stabilization. Managing to increase resistance and resilience would result in opening forests, reducing the extent of drought intolerant tree and shrub species, increasing the extent of savannas and grasslands, and reducing the extent of invasive plants. Sudden changes in plant community extents and species composition resulting from disturbance would be less likely. Alternative B would specifically encourage the use of assisted migration using seeds and other propagules that provide ecotypes currently not present that are likely better adapted to the expected future climate. The extent and overall productivity of camas and Garry oak likely would increase. This alternative would allow the BLM to adapt to the loss of

effectiveness of some invasive plant control measures, thereby increasing the likelihood of effective control. Hard shoreline stabilization would better protect cultural sites from the effects of sea level rise. However, hard shoreline stabilization could also result in narrowing or loss of beaches and associated habitat, loss of driftwood and the associated nutrients, steepening of the nearshore environment, and increased erosion further downshore from the redirected wave energy (Coyle and Dethier 2010 and references therein).

The level of active management under this alternative would provide opportunities for the BLM to include climate change adaptive measures in project planning. While tree planting is not anticipated as a regular action following forest and woodland thinning, planting of ecoytpes or genotypes better adapted to the expected changes in climate, such as Douglas-fir from a warmer, drier seed zone, could occur to meet this alternative's stated objectives. If climate change occurs more rapidly than currently anticipated, Alternative B may allow the introduction of species native to Washington but not presently found on the San Juan Islands, such as ponderosa pine, that are better adapted to warmer, drier conditions.

Alternative C

Under Alternative C, the BLM would actively manage vegetation to approximate the pre-Euro-American extents and conditions of plant communities within the Monument boundaries. The BLM would allow the use of all vegetation management methods to meet the alternative's objectives. Soft shoreline stabilization would be allowed, but hard shoreline stabilization would not. Approximating the pre-Euro-American extent and condition of plant communities would likely result in similar plant community types and structures as under Alternative B, although there may be differences in species compositions because Alternative B would allow for use of non-invasive, non-native plant materials where appropriate to enhance ecological resistance and resilience. As with Alternative B, the extent and productivity of camas and Garry oak would increase. The use of soft shoreline stabilization alone would produce the same results as under Alternative A.

The level of active management under Alternative C provides similar opportunities for taking climate change adaptive actions as under Alternative B. A primary difference between the two is that under Alternative C, the BLM does not anticipate potentially introducing species native to Washington but not currently found on the San Juan Islands. However, the BLM could potentially bring in ecotypes or genotypes of species currently present but that are better adapted to warmer, drier conditions. For example, the BLM could plant Garry oak seedlings from northwest Oregon if those seedlings were expected to be better adapted to future climate conditions than the ecotypes presently found on the San Juan Islands.

Sub-Alternative C

Sub-Alternative C is the same as Alternative C except that the use of chemical treatments would not be allowed. Under this sub-alternative, the BLM would be less likely to effectively control invasive plants and less able to adapt as climate change renders some methods less effective and new invasive plants emerge or appear. Whether the extent and productivity of camas and Garry oak would increase is less certain given the likelihood of increased competition from invasive plants.

Alternative D

Under Alternative D, the BLM would manage plant communities to maintain approximately the current extent and condition. The BLM would allow the use of all vegetation management methods to meet the alternative's objectives. Soft shoreline stabilization to protect cultural and paleontological sites would be allowed throughout the Monument and hard shoreline stabilization would be allowed in areas without wilderness characteristics.

Because this alternative would require the BLM to maintain the present conditions of plant communities within the Monument, climate change would make achieving the vegetation management objectives of this alternative increasingly difficult over time. Maintaining current conditions means also maintaining

current vulnerabilities (see the Wildfire section, for examples). These vulnerabilities increase the probability of sudden shifts in plant community extents and conditions, similar to the No Action Alternative and Alternative A. Camas and Garry oak would likely see little improvement in extent and condition except possibly as a result of invasive plant control. Hard shoreline stabilization would better protect cultural and paleontological sites on the large islands, but the effectiveness of soft stabilization on areas with wilderness characteristics (including the east side of Patos Island) would be limited, assuming cultural or paleontological sites needing protection are present on vulnerable shorelines. Hard shoreline stabilization would have the same potential impacts as described under Alternative B.

Since the BLM would attempt to maintain current conditions under Alternative D, opportunities for active management would be limited over the expected life of the plan, affording fewer opportunities to apply climate change adaptive actions. This alternative would potentially provide more opportunities than Alternative A, but likely far fewer opportunities than alternatives B and C.

Conclusions

The level of active management allowed under alternatives B and C would provide the greatest opportunities to apply climate change adaptive measures. Under the No Action Alternative, the BLM assumes that under its current custodial management approach it would continue not to apply climate change adaptive measures.

Cultural Resources

Key Points

- Cultural resources are nonrenewable resources. Once altered, damaged, or destroyed, the values that contribute to their cultural and historical significance are forever altered or lost.
- The Monument contains objects and values of traditional cultural and historical importance to the Coast Salish tribes who continue to utilize and value the lands and resources in the region.
- Under all alternatives, the BLM would identify whether cultural resources are present before authorizing ground disturbing projects. Where cultural resources are identified, the BLM would modify the project to avoid or reduce impacts.
- Alternatives B and C would have the greatest potential for disturbance to cultural resources from vegetation treatments.
- The No Action Alternative and alternatives B and D would have the greatest potential for disturbance to cultural resources from recreation.

This section contains two analytical issues:

1. How would the alternative approaches to shoreline stabilization, vegetation management, and recreation management affect archaeological and other cultural resources within the Monument? (Page 50)
2. How would the alternatives affect historic properties within the maritime heritage areas? (Page 61)

Background

Proclamation 8947 identifies historic and cultural values as among the objects for which the Monument was established. It specifically references sites that are evidence of the area's current and ancestral importance to the Coast Salish tribes, including shell middens, reef net locations, and burial sites. It also addresses buildings and features associated with the Monument's rich maritime history, such as the Patos Island Lighthouse and the Turn Point Light Station.

For further background information on cultural resources in the San Juan Islands see Appendix E.

Cultural Resources Analytical Issue 1: *How would the alternative approaches to shoreline stabilization, vegetation management, and recreation management affect archaeological and other cultural resources within the Monument?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The age of cultural resources documented in the San Juan Islands extends back more than 10,000 years. The BLM has inventoried about a third of the Monument for cultural resources and has documented 25 cultural sites[33]. Additional inventory is likely to identify additional cultural properties associated with Native American/Indigenous habitation and use and with Euro-American settlement and development. Specific site locations, particularly those associated with archaeological, spiritual, or ceremonial values, are often sensitive. The BLM does not disclose these sites in publically available documents, such as this Draft RMP/EIS, to protect their values from potential looting, vandalism, or intrusion.

Few sites in the San Juan Islands have been formally evaluated for listing on the National Register of Historic Places. Archaeological and other cultural or historical sites that have the potential to yield important information about the past, that have an association with historically important people or events, or that are considered a work of a master are considered eligible for listing in the National Register of Historic Places in most instances and are avoided during surface disturbing activities.

The documented archaeological sites in the Monument are predominantly associated with Coast Salish occupation and resource procurement, including a rock shelter, campsites, shell middens, and rock features. Burials, defensive sites, and modified trees also have been documented in the Monument. Archaeological sites are nonrenewable resources affected by numerous natural and cultural processes. The following factors affect site condition within the Monument: shoreline erosion, recreational activities, animal burrowing, trees encroaching on pre-European settlement managed grasslands, and natural weathering and decay. The degree to which sites are affected depends on factors including the nature of the site, setting, and the process or activity affecting the site.

Since prior to BLM administration, cultural sites (including archeological sites) on the lands now within the Monument have been adversely impacted by shoreline erosion, natural deterioration, and wildfire, as well as by construction and maintenance of aids to navigation facilities, roads, trails, and residential, agricultural, and recreational development. Some sites have been affected by visitor use, vandalism, and looting. The BLM has sought to minimize impacts to archaeological and cultural sites from construction and maintenance of roads and facilities.

Within the Monument, 96 percent of the documented cultural sites occur within 164 feet[34] of the shoreline. In consultation with its tribal partners, the Washington SHPO, and other community partners, the BLM has reduced risks of resource damage from shoreline erosion and recreational impacts in certain vulnerable areas. This has included shoreline stabilization using geotextile fabrics and natural materials such as boulders and ballasted logs to reduce erosion and allow natural vegetation to re-establish and stabilize eroded site margins. As of the publication of this document, the BLM has only applied soft stabilization measures. The BLM and its partners have also recovered important cultural data and materials where they could not effectively implement stabilization measures.

Most Monument shorelines are relatively unaltered pocket beaches, feeder bluffs, and rocky headlands. While less altered than shorelines outside of the Monument, lower impact developments have taken place on lands now included within the Monument. Developments constructed before BLM administration include lighthouses and associated aids to navigation and facilities, recreation sites, and roads and trails

[33] Historic properties associated with the Monument's lighthouses are addressed under Issue 2.

[34] Generally, 164 feet is the minimum distance the BLM uses for buffers to avoid potential impacts to cultural resource sites.

used to access them. Proliferation of user created trails has continued under the BLM's administration of the Monument. In addition, filling and development occurred historically in and near the wetland at Watmough Bay and agricultural development occurred near Chadwick Hill and at Iceberg Point.

The BLM conducts proactive cultural resource inventories to identify resources at risk from looting, vandalism, or natural processes prior to substantial impact or loss. In addition, the BLM conducts cultural resources inventories in compliance with Section 106 of the National Historic Preservation Act. When undertaking management actions, the BLM seeks to avoid impacts to cultural resources and implement measures to protect or mitigate effects. Regulatory compliance activities and proactive cultural resources management actions in general ensure site conditions in the Monument are stable.

Effects of the Alternatives

Under all alternatives, the BLM would address potential impacts to cultural resources at the design or implementation phase of future projects through National Historic Preservation Act Section 106 review. Section 106 compliance includes identification, evaluation, and mitigation of effects to properties eligible for listing on the National Register of Historic Places. The BLM would work with partners, including the SHPO and THPOs as necessary, to avoid, minimize, or mitigate potential adverse effects to National Register eligible properties. It would undertake temporary closures as necessary to protect the Monument's ecological and cultural values, as well as sensitive tribal activities.

Impacts from Shoreline Stabilization

Shoreline stabilization measures would reduce or limit shoreline erosion from large storm events. Storms and associated tidal surges can modify spatial relationships of artifacts and alter or destroy physical evidence of occupation in those areas. This can cause the loss of information about site function, dates of occupation, subsistence, and past environments, each of which is important to understanding past cultures and lifeways. In addition, shoreline erosion can damage or destroy cultural and historical values of importance to tribes and local communities. Measures to stabilize shorelines could preserve the integrity of cultural deposits and prevent further damage to cultural and historical values from natural processes.

Given that 96 percent of the Monument's documented cultural sites occur within 164 feet of the shoreline, the BLM, in consultation with its tribal partners, Washington SHPO, and other community partners, may need to undertake shoreline stabilization to protect cultural resources within the life of the plan. It is not possible to predict the number or location or these projects. Soft stabilization would be allowed under all alternatives; the alternatives vary as described below in allowing hard shoreline stabilization.

Soft stabilization measures generally allow natural processes, such as movement of water, fauna, flora, and mineral materials along the beach margins, to continue while reducing the magnitude and severity of erosion and sediment removal. Although soft stabilization measures are generally less intrusive to the cultural setting and natural processes, they may be less effective than hard shoreline stabilization for controlling impacts from high energy events or at locations with steep, unstable slopes or high bank erosion (Gianou 2014, NYSDEC 2010).

The BLM and its partners may determine that all stabilization measures would be ineffective in certain locations, such as along some steep, unstable slopes. Because of this, high energy storm surges and other events would continue to damage, alter, and destroy cultural resources under all alternatives.

Both hard and soft stabilization measures can directly and indirectly affect cultural properties. Construction of stabilization measures can disturb portions of cultural sites and cause changes in erosion and aggradation patterns outside of the stabilized portion of the site. These effects must be balanced against the threat to cultural and historical resources from erosion.

Short-term impacts would occur where stabilization measures temporarily block or impede access to or use of a cultural property or where they temporarily affect the historic setting. Stabilization measures that disturb a portion of an archaeological site or cultural property or introduce structures incompatible with the historic setting would have long-term or permanent impacts to the site and/or historic setting. The

BLM, potentially working with one or more partners, would conduct mitigation to address adverse impacts to important cultural and scientific values from stabilization measures. It would also conduct mitigation when stabilization measures are determined to be ineffective or impractical.

Hard stabilization can be more intrusive than soft stabilization, resulting in more marked long-term or permanent impacts to the historic setting and natural processes, such as increased sediment delivery, reduced sediment retention, reflected wave energy, and modified sand circulation/deposition (WDOE 2014). Impacts to nearshore habitats are described in Habitat and Plants Issue 2 beginning on page 98.

No Action Alternative

Under the No Action Alternative, the BLM could continue to use shoreline stabilization to protect cultural resources. As a result, it would occasionally undertake soft stabilization measures. Hard shoreline stabilization could occur where high value resources are in imminent risk of loss and soft stabilization measures would be ineffective. This analysis assumes that the BLM would be less likely to undertake hard stabilization than under alternatives B and D due to its current custodial management approach.

Alternative A and Alternative C

Under alternatives A and C, the BLM would continue to allow soft shoreline stabilization to protect cultural resources. The BLM would prohibit hard shoreline stabilization. Some additional cultural resources would be lost compared to alternatives that allow hard shoreline stabilization due to high energy storm events or in locations that have steep, unstable slopes or that have high bank erosion.

More cultural resources could be damaged or lost under these alternatives than under the No Action Alternative and alternatives B and D where hard stabilization would be allowed. The potential impacts to cultural resources and natural shoreline processes from implementation of hard shoreline stabilization would be less than under these alternatives.

Alternative B

Under Alternative B, the BLM would allow hard shoreline stabilization, in addition to soft stabilization, to reduce the potential for damage, alteration, or loss of cultural resources from high energy storm surges and events. Hard shoreline stabilization would be allowed where the BLM, in consultation with partner agencies, determined that soft stabilization measures would be ineffective. Allowing both hard and soft stabilization measures would provide a wider range of options for protecting and stabilizing threatened cultural sites. Because the BLM would allow all stabilization tools throughout the Monument, it is likely that the BLM would protect and stabilize more sites under Alternative B than under any other alternative.

The BLM expects that impacts to sites and other cultural properties from construction and implementation of hard shoreline stabilization would be greater under Alternative B than under alternatives where it would prohibit hard shoreline stabilization.

Alternative D

Under Alternative D, the BLM would continue to allow soft shoreline stabilization to reduce impacts and loss of cultural resources due to increased erosion and impacts from storm surges and human activities. It would also allow shoreline stabilization in the majority of the Monument when soft stabilization measures are determined to be ineffective. The BLM would prohibit hard shoreline stabilization in areas with wilderness characteristics (232 acres). Allowing both hard and soft stabilization measures would provide a wider range of options for protecting and stabilizing threatened cultural sites. The BLM would likely protect and stabilize more sites and other cultural properties under Alternative D than under alternatives A, C, or Sub-C but less than under Alternative B or the No Action Alternative.

In areas with wilderness characteristics would damage, alter, or destroy some cultural resources that could have been protected through hard stabilization. The BLM expects that impacts to sites and other cultural properties from construction and implementation of hard shoreline stabilization would be greater under Alternative D than under alternatives where it would not allow hard shoreline stabilization.

Impacts from Recreation

Under all alternatives, where the BLM identified conflicts between human uses and cultural resources, it would develop implementation-level cultural resource or recreational management plans and take measures to reduce potential impacts to cultural sites and properties. These measures must be consistent with the Approved RMP. If the BLM identified necessary measures that were not consistent with the Approved RMP, it would consider undertaking a plan amendment (e.g., if a permanent and complete closure of an area to camping was identified as essential to protecting cultural resources and the RMP identifies the area as open to camping).

Recreational use and access can affect cultural resources through direct disturbance, soil compaction, altered surface water drainage, erosion, intrusions to the setting, and access leading to unauthorized collection or vandalism. These effects can result in a loss of site integrity, scientific information, and associated cultural values. Despite previous archaeological surveys and investigations, there is the potential for undiscovered, buried cultural resources and human remains. Surface-disturbing activities would directly affect any undiscovered cultural resources and human remains by exposing buried material. This would result in inadvertent artifact destruction or scientific context loss, including potential illicit collecting of newly exposed materials.

Management actions that interfere with the exercise of traditional cultural uses and practices or the exercise of treaty rights can affect cultural resource values. The historic value and significance of a traditional cultural property can be assessed by its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. Management actions that introduce activities, structures, or features that are incompatible with the setting for traditional practices or remove or obscure natural features or resources can affect the values that define or contribute to the importance of a traditional cultural property. Some traditional cultural practices may also be associated with ceremonies that require privacy and solitude; activities that conflict with privacy and solitude would negatively affect these practices. Recreational restrictions would not affect access to the Monument for tribal members for the exercise of treaty rights and traditional cultural practices.

The potential for impacts on cultural resources would increase as recreational use increases or is concentrated. Repeated use or visits over time could also increase the intensity of impacts due to natural processes, such as erosion. Even where land managers require visitors to remain on trails, repeated visits to locations can create new social trails, often leading visitors to or across cultural sites. Prohibiting access or restricting visitor use to designated roads and trails would reduce the risk of impact to cultural resources from these activities, if access for cultural purposes can be maintained and cultural site protections are implemented and maintained.

Camping could permanently affect cultural resources through direct disturbance of site structure, artifact breakage and displacement, vandalism, soil compaction, altered surface water drainage, erosion, creation of new routes, and visual and aural intrusions to the setting. Regulating or restricting camping and recreational access can reduce the potential for impacts to cultural sites by controlling the amount and location of activities in areas with sensitive resources. Restricting camping to designated sites would concentrate impacts to those locations and reduce the risk of disturbing cultural resources outside of sites though impacts from camping would still occur. Prohibiting camping or restricting it to designated campsites would reduce the risk of impact to cultural resources from camping, if access for cultural purposes can be maintained and cultural site protections are implemented and maintained. In the analyses below, a large cultural site may be located in more than one type of camping designation.

No Action Alternative

Under the No Action Alternative, 14.9 miles of existing trails in the Monument would continue to be open to non-motorized travel. If current trends continue, visitors would use these trails almost exclusively for hiking, with a small amount of equestrian use on Lopez Island. Overland hiking would

continue to be allowed under this alternative. As a result, trail miles in the Monument's more accessible grasslands and shrublands, such as at Iceberg Point and Cattle Point, would likely increase over time.

Use of the trails would continue to have direct negative short-term and long-term impacts on sites and other cultural properties crossed or accessed by trails, through soil compaction, erosion via channeling of water, and widening of trails during wet periods. Currently, 76 percent (19 sites) of the Monument's recorded cultural sites are within 164 feet of roads and trails. Under this alternative, measures to reduce impacts to sites would continue but the potential for impacts from use and maintenance would grow if visitation continues to increase over the next 20 years.

The BLM would continue to allow dispersed camping in the Monument except where prohibited by the current ACEC decisions (Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay). Areas that would continue to be open to this use include 66 acres of grassland potentially associated with traditional plant gathering. Twenty-two recorded cultural sites occur within areas open to camping. If current recreation patterns continue, participation in this activity would remain relatively low. Camping in existing designated sites would continue. Approximately half of the recorded cultural sites within the Monument occur in or near designated camping areas.

Alternative A

Under Alternative A, the BLM would facilitate use of the Monument for authorized research, and educational, cultural, and spiritual activities. The BLM would not designate any of the potential recreation management areas (RMAs) under Alternative A and would prohibit recreation on Monument lands. This alternative would minimize impacts to cultural sites and values from human use to a greater extent than any other alternative. Traditional uses of cultural properties would continue.

Assuming current visitation trends continue, the closure of the Monument to recreational use would increase visitation to non-Monument public lands in the area. Depending on the density of cultural sites at the alternative recreation locations, this could increase impacts to non-Monument cultural sites.

The impacts from recreation described under the No Action Alternative would not continue under this alternative, though impacts from access for administrative and authorized uses would continue. Because there would be many fewer visitors on the Monument, and the BLM would authorize uses, the BLM expects fewer and less severe impacts to cultural resources under this alternative. The BLM would continue to maintain roads for authorized and administrative uses. This would include maintaining a road that crosses the cultural site associated with the Turn Point Light Station. Impacts to this cultural site from maintenance and authorized and administrative use of this road would continue.

Alternative B

Under Alternative B, the BLM would designate all potential RMAs except Category A and B Rocks. All but 10 acres of the Monument would remain open to recreational use. The impacts from recreation described under the No Action Alternative would not continue in those sites closed to recreation use, though minor impacts from access for administrative and authorized uses would continue. To provide opportunities for solitude and quiet, 168 acres of the Monument would be open for recreation by permit only, which would reduce impacts by controlling the amount of recreation allowed in those areas. All 25 recorded cultural sites would be within designated RMAs in this alternative.

The BLM would designate 19.3 miles of trail in the Monument for hiking in this alternative; this would be a 27 percent increase compared to existing trail miles. This would include 5.2 miles of new trails in areas previously without trails, increasing the potential for short-term and long-term direct and indirect impacts to cultural sites. Although the BLM has not yet inventoried potential new trail routes for cultural resources, there would be approximately an 18 percent increase in the number of previously recorded sites that would be near to or crossed by trails under this alternative. The BLM would conduct cultural resource inventories prior to constructing new trails and reduce adverse impacts by routing trails away

from cultural sites. Limiting access to designated trails except for authorized uses would reduce impacts to cultural sites outside of the designated trail routes.

Under Alternative B, there would continue to be designated site camping in existing sites. RMAs with designated sites would include 13 cultural sites, approximately half of the recorded sites in the Monument. Areas where the BLM would allow dispersed camping by permit only include 9 sites. Limiting camping to small groups by permit in specified areas would reduce potential impacts to cultural sites. When developing the permitting system during plan implementation, the BLM would consult with affected tribes and conduct cultural resource surveys of the areas proposed for dispersed camping. It could develop the permit system to exclude specific cultural sites and values.

Areas where camping would be prohibited include 6 sites, which would reduce the potential impact of camping compared to the No Action Alternative.

Alternative C

Under Alternative C, the BLM would designate all potential RMAs except for Category B Rocks. All but 7 acres of the Monument would remain open to recreational use. Category B Rocks reportedly receive minimal visitation so this closure would likely have minimal effect on cultural resources. The BLM would also manage 3 acres of the Monument (Category A Rocks) as open for recreation by permit only, which would reduce impacts by controlling the amount of recreation allowed in those areas. As in Alternative B, all 25 sites would be within designated RMAs.

The BLM would designate 11.3 miles of trail in the Monument for hiking; 3.5 of these miles would also be open to equestrian use. The BLM would close 3.6 miles of existing trail. The number of recorded cultural sites crossed by trails (19) would be similar to the No Action Alternative. Trail access would decrease by 25 percent compared to the current route network. Limiting hiking to designated trails except for the authorized purposes would reduce the potential for impacts to cultural sites.

The BLM would only allow camping in existing designated sites under this alternative; there would be 13 cultural sites in RMAs open to designated site camping. The BLM would prohibit dispersed camping throughout the Monument. Approximately half of the recorded sites in the Monument are located in areas where camping would be prohibited in this alternative. This alternative would reduce the potential for impacts from recreation to cultural sites more than the other analyzed alternatives except Alternative A.

Alternative D

Under Alternative D, the BLM would designate all potential RMAs. As under alternatives B and C, all 25 known cultural sites would be within an RMA.

The BLM would designate 23.4 miles of trail in the Monument for hiking; approximately 8 of these miles would be open to equestrian and bicycling use. Overall, trail access in the Monument would increase by 54 percent. The BLM would close 0.5 miles of trail existing trail and would develop 8.8 miles of new trails; 0.2 miles of existing trail would be widened. Similar to Alternative B, roads and trails in Alternative D would cross or be located near 23 recorded cultural sites in the Monument. The BLM expects that development of approximately 8.8 miles of new trails would result in at least an 18 percent increase in the number of recorded sites crossed by or located near trails. Identifying and surveying for cultural resources prior to implementation and rerouting trails to avoid impacts to cultural sites would reduce potential impacts to cultural resources in those locations. The acreage of recorded cultural sites crossed by roads and trails would be highest in this alternative; it would be slightly higher (3 percent) than Alternative B and approximately 30 percent higher than the No Action Alternative.

As under all alternatives except for A, the BLM would continue to allow camping in designated sites at Blind, Patos, and Posey islands. Through implementation-level planning and analysis, the BLM could develop additional campsites and visitor facilities in these locations. The BLM would also designate an additional 221 acres of Monument land as open to designated site camping. Specific locations for new designated sites and new visitor facilities would be identified during plan implementation. Identifying

and surveying for cultural resources prior to implementation and selecting sites to avoid impacts to cultural sites would reduce potential impacts to cultural resources in those locations. RMAs open to designated camping would include 20 documented cultural sites. Designated site camping would potentially have both short-term and long-term and direct and indirect impacts on approximately 80 percent of all recorded cultural sites in the Monument.

The BLM would continue to allow dispersed camping on 167 acres of Monument land currently open to this use and on 370 acres of land currently closed to this use at Chadwick Hill and Point Colville. Opening areas currently closed to dispersed camping would increase the potential for long-term and direct impacts to cultural resources in these areas. Under Alternative D, RMAs open to dispersed camping would include six recorded cultural sites. The BLM would close the remainder of the Monument (49 acres) to camping, reducing the potential for adverse impacts to cultural sites. Two recorded sites occur in areas where the BLM would prohibit camping.

Impacts from Vegetative Treatments

Under all alternatives, the BLM would implement some vegetation treatments to protect human health and safety (i.e., hazard tree removal) and to control invasive plant species designated by Washington State for mandatory eradication or control. Where vegetation projects require seeding or planting, the BLM would include culturally important plants, such as camas, where possible.

Vegetation management can include mechanical, biological, chemical, and prescribed fire treatments. The treatment measures the BLM would allow during plan implementation vary by alternative. While the BLM would undertake cultural inventory prior to authorizing surface disturbing projects, vegetation treatments such as hand pulling, digging, surface scarring, tilling, or tree removal could directly impact undiscovered cultural resources and human remains. Chemical treatments (e.g., herbicide) could alter the chemistry of soils and artifact residues and affect the reliability of dating cultural materials if directly or indirectly exposed to the chemical (BLM 1991; BLM 2007). Prescribed fire could affect flammable cultural materials and artifacts and cause staining and spalling of lithic artifacts or features such as pictographs and distort site or artifact dating analyses.

Very short-term impacts (i.e., those lasting for the duration of the project) of treatments include temporary effects to the historic setting of a cultural property (e.g., through the presence of machinery); short-term impacts would include alteration of the setting beyond the duration of the project (e.g., recovery of vegetation). Long-term or permanent impacts would occur when cultural sites and/or artifacts and features are substantially damaged or destroyed.

Vegetation treatments would also affect access to cultural properties. Access would be temporarily limited during mobilization, operational, and demobilizing periods for mechanical and fire treatments and during chemical herbicidal applications. Some chemical herbicidal applications may have short-term to long-term impacts to traditional plant gathering activities.

If the BLM does not implement vegetative treatments, noxious weeds and invasive plants would continue to increase and encroachment of grasslands and shrublands would continue, having a long-term impact on the historic setting and the availability of plants for traditional uses. Removal of hazard trees or other vegetation creating fuel ladders may benefit cultural properties threatened by falling trees or fuel loading.

No Action Alternative

Under the No Action Alternative, the BLM would continue custodial management; the BLM assumes it would continue very limited vegetation treatments (approximately 20 acres per year). This alternative would have the least potential for disturbance from vegetation treatments to impact cultural resources.

Over time, continued encroachment by woody shrubs, invasive species, and forest species would diminish meadow and grassland areas of traditional cultural importance for plant gathering, other traditional activities, and the exercise of tribal treaty rights. It is possible that a wildland fire or other disturbance would occur over the next 20 years and slow this trend. However, wildland fires are unusual in the San

Juan Islands and, under the No Action Alternative, the BLM would suppress any that occurred. The BLM would assess and treat potential hazard trees around administrative facilities or historic structures to reduce potential impacts from tree fall on those properties.

The BLM's limited approach to managing vegetation under this alternative would continue to create very few (i.e., affecting at most 20 acres per year) access disruptions during mobilization, operational, and demobilizing periods for mechanical treatments. Most treatments the BLM currently undertakes (e.g., hand cutting of invasive plants) result in very limited disruption of access.

Alternative A

Under Alternative A, the BLM's management of vegetation would continue to be largely passive; the BLM would not allow prescribed burning or chemical (i.e., herbicide and pesticide) treatments under this alternative. Given that natural succession and other processes would be allowed to continue to the 50 percent threshold identified for vegetation treatments prior to treatment (see page 17), the potential for direct impacts to cultural resources from vegetation treatments would be limited (i.e., affecting approximately 50 acres per year), though greater than under the No Action Alternative.

Encroachment by native forest species into the grasslands and shrublands would continue and the condition of these communities would likely decline over time as a result of limited invasive plant treatments undertaken in the absence of herbicides. This would result in a decline in the size and condition of grasslands and meadows important for traditional plant gathering and other activities (see Table 7 on page 75).

The BLM's limited approach to managing vegetation under this alternative would create very few (i.e., affecting approximately 50 acres per year) access disruptions during mobilization, operational, and demobilizing periods for mechanical treatments.

Alternative B

Under Alternative B, the BLM would manage the Monument to enhance the San Juan Islands' ecological resistance and resilience by increasing the extent of native plant communities—specifically grasslands and wetlands—that are relatively scarce within the San Juan Islands as a whole. To achieve this objective, the BLM would conduct extensive grasslands and shrubland restoration within the Monument (see Table 18 on page 112). As under alternatives C and D, the BLM would consider all tools in designing implementation-level vegetation treatments.

The magnitude and intensity of the vegetation control and restoration measures under Alternative B would increase the potential for short-term and long-term impacts to cultural resources from disturbance, chemical treatments, and fire. Treatments have the potential to inadvertently disturb or destroy artifacts and cultural features and their scientific context within archaeological sites located within the treatment area. Based on the estimated acres of treatment the BLM would undertake under this alternative (see Habitat and Plants Issue 3), the potential for long-term or permanent impacts from damage or destruction of archaeological and cultural sites, artifacts, or features are greater under this alternative than under the No Action Alternative and alternatives A and D.

Vegetation treatments implemented to enhance native species richness and structural component diversity would have a positive long-term effect on diversity and cover of functional/structural group species, though some short-term negative impacts would occur. Over the long-term, treatments to enhance grasslands and shrublands would expand opportunities for traditional cultural uses.

Vegetation treatments under Alternative B would cause more very short-term (i.e., for the duration of the project) to long-term disruption of access to or use of important traditional plant gathering areas including traditional cultural properties than under the No Action Alternative and alternatives A and D.

Alternative C

Under Alternative C, the BLM would manage the Monument to approximate the extent and condition of plant communities that existed prior to European settlement of the San Juan Islands (approximately 1860), when Coast Salish people used fire to manage landscapes. To achieve this objective, the BLM would undertake extensive grasslands and shrubland restoration (see Table 19 on page 114). The BLM estimates that meeting the objectives of this alternative would require the most acres of vegetation treatment over the life of the plan of any alternative other than Sub-Alternative C. As under alternatives B and D, the BLM would consider all tools in designing implementation-level vegetation treatments.

The estimated mechanical treatments under this alternative would increase the potential for very short-term (i.e., duration of the project) to long-term effects on cultural resources. Greater acres of treatment would be required to remove non-native plants, woody shrubs, and trees to an extent that would approximate historic conditions. Short-term and long-term negative impacts related to ground disturbance, prescribed fire, and chemical use would be similar to but greater than those described under Alternative B.

Vegetation treatments implemented to approximate historic conditions would have a major positive long-term effect on diversity and cover of functional/structural group species though some short-term negative impacts. Over time, this would benefit properties associated with traditional plant gathering. Treatments would include intensive restoration efforts to remove non-native plants and restore native plants, including culturally important species, which would benefit traditional cultural properties or landscapes important for plant gathering and related activities.

Vegetation treatments under Alternative C would cause more very short-term (i.e., for the duration of the project) to short-term disruption of access to or use of traditional plant gathering areas or traditional cultural properties and landscapes than under the No Action Alternative and alternatives A, B, and D.

Sub-Alternative C

Effects to cultural resources from vegetation treatments would be similar to, but greater in magnitude than, those under Alternative C. Without the use of herbicides, the BLM estimates that it would need to increase the repetition of mechanical treatments to meet the habitat and plant community objectives (see Table 20 on page 115). Short-term and long-term negative impacts related to ground disturbance would be similar to but greater than those described under Alternative C.

Vegetation treatments under Sub-Alternative C would cause more very short-term (i.e., for the duration of the project) to short-term disruption of access to or use of traditional cultural properties or landscapes associated with traditional plant gathering than any other alternative.

Alternative D

Under Alternative D, the BLM would maintain the approximate extent and condition of plant communities that it has documented in the Monument as of 2016. The BLM estimates that this would require more acres of vegetation treatment than would occur under the No Action Alternative and Alternative A, and substantially fewer acres than would be required to meet objectives and management direction under alternatives B, C, and Sub-C. As under alternatives C and B, the BLM would consider all tools in designing implementation-level vegetation treatments. The potential for direct impacts to cultural resources from vegetation treatments would be limited (i.e., affecting an estimated 66 acres per year), though greater than under the No Action Alternative and Alternative A.

Vegetation treatments would target the edges of grasslands and shrublands to prevent conversion to forest and woodlands; they would also target new or expanding invasive plant populations. Through active management, the extent of grassland and shrubland plant communities would remain at their approximate 2016 extent instead of decreasing over the life of the plan as they would under the No Action Alternative and Alternative A. The condition of areas of traditional cultural importance for plant gathering would remain relatively unchanged. While vegetation treatment would limit encroachment of forest vegetation

into grasslands and shrublands, the condition of cultural properties important for traditional plant gathering would not be improved or expanded as under alternatives B and C.

The BLM's maintenance of the existing extent and condition of plant communities would create few (i.e., an estimated 66 acres per year) access disruptions during mobilization, operational, and demobilizing periods for mechanical treatments.

Conclusion for Cultural Resources Issue 1

The alternatives would vary in their effects on cultural sites within the Monument.[35] Specifically, they would vary in terms of the stabilization tools available to the BLM, the potential for short-term and long-term effects from disturbance related to recreation activities and vegetation management, and the extent to which they would improve conditions for traditional cultural plant gathering.

Stabilization of cultural sites threatened by erosion and storm surges would be most effective under Alternative B and the No Action Alternative, where the full range of shoreline stabilization measures would be available to protect any cultural site in the Monument. Under alternatives A and C, and under Alternative D in areas with wilderness characteristics (232 acres), the BLM would not allow hard shoreline stabilization. Because soft stabilization measures are less effective than hardening in certain situations, the BLM assumes that some additional cultural resources would be damaged, altered, or lost under alternatives that do not allow hard shoreline stabilization in some or all of the Monument.

Under all alternatives, the BLM would identify cultural resources through consultation and cultural resource inventory prior to authorizing implementation-level projects that can impact archaeological and cultural properties, such as designated campsite development, trail building, tree removal, digging, tilling or pulling to remove invasive plants. Where cultural resources are identified, the BLM would modify the project to avoid or reduce impacts. Despite these precautions, recreational activities and vegetation management create the potential for disturbance and loss of cultural resources. Where important cultural and archaeological resources could not be avoided, the BLM, through consultation, would develop mitigation to address adverse impacts to affected cultural resources.

Under Alternative A, the BLM would prohibit recreational use of the Monument and undertake a very limited approach to vegetation management. This alternative would have the lowest potential of any alternative for disturbance to cultural resources from the recreational activities and vegetation management. However, grasslands and shrublands associated with potential traditional cultural properties or landscapes would continue to shrink.

Under the No Action Alternative and Alternative D, potential impacts from camping, off-trail hiking, and extensive trail use would occur, but there would be limited potential for disturbance of cultural sites due to vegetation management. As a result, the No Action Alternative and Alternative D would both have an intermediate potential for disturbance to cultural sites. This intermediate potential would be greater under Alternative D than the No Action Alternative due to increases in camping and trail miles. Alternative C and Sub-Alternative C would have the greatest potential of any alternative for disturbance to cultural sites from vegetation treatments, but more limited potential for disturbance from trail use and camping. Because of this mix of high potential for disturbance from vegetation treatments and a moderate potential for disturbance from recreational activities, these alternatives would have a higher potential for disturbance compared to the No Action Alternative and alternatives A and D.

Under Alternative B, the BLM would undertake more extensive vegetation treatments than would occur under the No Action Alternative and alternatives A and D, though they would be less extensive than under Alternative C and Sub-Alternative C. Under this alternative, more than half of the Monument would be open to dispersed camping by permit and trail miles would increase. Because of the relatively high potential for disturbance from both recreation and vegetation management, the BLM believes this

[35] Impacts to maritime heritage resources are covered under Cultural Resources Issue 2.

alternative would have a high potential for disturbance to cultural resources. However, having both hard and soft shoreline stabilization measures available would reduce potential impacts to cultural sites.

Vegetation treatments implemented to enhance ecological resilience and resistance and to approximate historic conditions would have a major positive long-term effect on diversity and cover of functional/structural group species. While these treatments would increase the potential for disturbance of cultural sites, over time they would benefit traditional cultural properties and landscapes associated with traditional plant gathering. Under the No Action Alternative and Alternative A, grasslands and shrublands with the potential for traditional plant gathering would continue to gradually shrink due to encroachment by forest species. Under Alternative D, the condition and extent of areas with the potential for traditional plant gathering would remain relatively unchanged.

Cumulative Effects of Alternatives on Archaeological and other Cultural Resources in the San Juan Islands

The Monument's contribution to the cultural and archaeological site record is relatively small: only about 6 percent of the recorded sites in the San Juan Islands are located in the Monument. However, the scientific and cultural value of the sites within the Monument are of high value, as recognized in the designating proclamation (see Appendix N). Sites in the San Juan Islands range from pre-European resource procurement areas and defensive sites to aids to navigation facilities of the late nineteenth and twentieth centuries. While it lacks historic military installations such as American Camp and English Camp and ethnographic village sites, sites within the Monument are largely representative of the range of cultural sites identified within the San Juan Islands in general.

Both within and outside of the Monument, natural erosion and human development have affected numerous cultural sites in the San Juan Islands. San Juan County—which makes up the great majority of the San Juan Islands—has the lowest shoreline modification level in the Puget Sound region, with around 5 percent of its shorelines modified (Herrera 2011, Friends of the San Juans 2011). Even with limited shoreline modification, development (e.g., marinas, homes, and roads) and some degree of shoreline simplification (i.e., a loss of ecosystem complexity) have altered the nearshore environment of all the major islands. The most common changes are the reduced presence or loss of bays (Simenstad et al. 2011), although their number and extent appear to have been limited historically. The BLM assumes that these developments have caused the disturbance or loss of an unknown number of cultural sites.

The condition and extent of plant communities would affect traditional cultural properties and landscapes associated with plant gathering and use. Grasslands in the Puget Lowland Ecoregion, which includes the San Juan Islands, have declined to an estimated 9 percent of pre-Euro-American settlement levels (Chappell et al. 2000). The Monument currently encompasses approximately 1 percent of the Southern Vancouverian Lowland Grassland and Shrubland occurring within the San Juan Islands; the great majority of lands in the San Juan Islands are in private ownership and are not necessarily available for the gathering of culturally important plants. Cumulative effects to grasslands, which have the potential for collection of culturally important plants, are discussed under Habitat and Plants Issue 2.

Reasonably foreseeable actions that would affect cultural sites along coastlines within the San Juan Islands over the next 20 years include the rerouting of the road to Agate Beach on Lopez Island[36] and the construction of docks and other small-scale coastline developments within the San Juan Islands. Because development and erosion along shorelines is likely to continue, cultural sites in the San Juan Islands will continue to be threatened, damaged, or lost. As a result, the overall number of sites in the San Juan Islands (documented and undocumented) will decline over time. While the total number of sites is likely to decline, the number of documented sites in the cultural and archaeological site record are likely to increase through inventories, unintentional discoveries, and new or ongoing cultural uses.

[36] A plan to reroute the road has not been developed, but the current road is experiencing a level of erosion that will require some action within the next several years.

The alternatives would differ in how they affect the Monument's contribution to the total cultural sites (including archaeological sites) in the San Juan Islands. As described in the conclusion, they would differ both because of the tools available to protect cultural and archaeological resources and because of the magnitude of the potential for these resources to be disturbed or lost due to recreation activities and vegetation management. Under all alternatives, there would be some potential for disruption or loss of cultural sites due to shoreline erosion and storm surge, visitor use, and vegetation management.

Based on the analysis above, the Monument's contribution to cultural sites in the San Juan Islands would be most likely to decline under Sub-Alternative C, followed by alternatives C, B, D, and the No Action Alternative. Alternative A would have the lowest likelihood of any alternative that the Monument's contribution to cultural sites in the San Juan Islands would decline over the life of the plan.

Cultural Resources Analytical Issue 2: *How would the alternatives affect historic properties within the maritime heritage areas (MHA)?*

See Appendix B for analytical methods used in this analysis. Archaeological resources associated with or located within MHAs are included in the analysis under Cultural Resources Issue 1.

Affected Environment

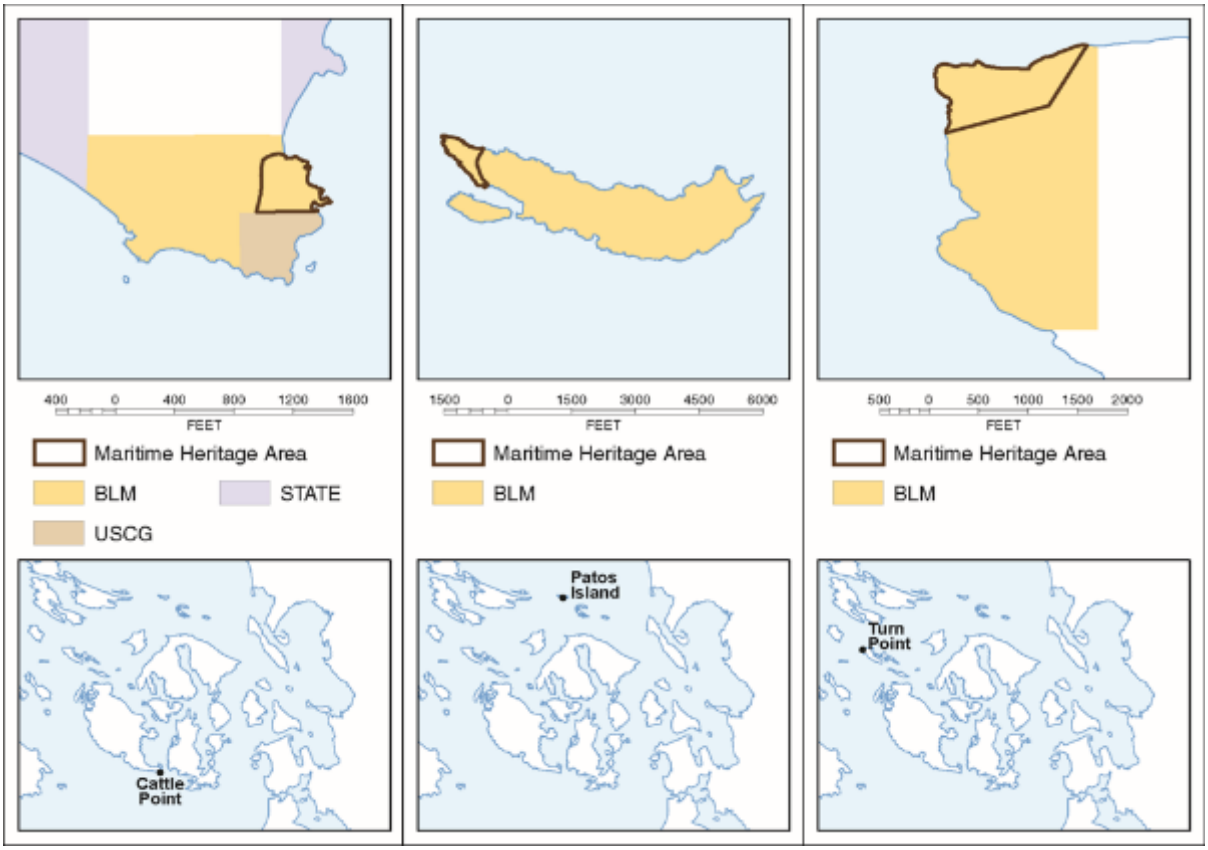
This document is using the term maritime heritage area to refer to the aids to navigation (i.e., lighthouse) facilities and surrounding lands at Turn Point, Patos Island, and Cattle Point (see Map 2). These total approximately 28 acres of Monument land. For Cattle Point, the MHA applies only to the BLM-administered land surrounding the lighthouse. The structure itself and approximately 2 acres of land immediately surrounding it are under Coast Guard jurisdiction.

The Monument includes two historic aids to navigation facilities: Patos Island Light Station (Patos Island) and Turn Point Light Station (Stuart Island). Both light stations were established in the 1890s and operated by light keepers until automated by the Coast Guard in the 1970s. Turn Point Light Station includes the historic light and fog signal structures and associated facilities such as keeper's quarters, barn, out buildings, cisterns, roads, trails, walkways, foundations, and associated archaeological remains. The facility is eligible for listing on the National Register of Historic Places. Patos Island Light Station includes the lighthouse and associated facilities including walkways, trails, access road, foundations, and associated archaeological remains located on the lands surrounding the facility. The Patos Island Lighthouse is listed on the National Register of Historic Places.

The Cattle Point Lighthouse, constructed on San Juan Island in 1935, is currently automated and under the jurisdiction of the Coast Guard. The lighthouse is eligible for the National Register of Historic Places. An historic cistern associated with the lighthouse property is located on adjacent Monument land within the Cattle Point MHA. Active erosion is occurring near the Cattle Point Lighthouse and along the nearby shorelines at Cattle Point. The Coast Guard recently completed a stabilization project at the Cattle Point Lighthouse to counter the effects of eroding sand dunes surrounding the facility.

In collaboration with its partner organizations—including the Turn Point Lighthouse Preservation Society and the Keepers of the Patos Light—the BLM has maintained the Patos Island Lighthouse and the Turn Point Light Station and its associated structures to preserve and protect them in their historic setting while providing opportunities for public education and interpretation. Although some structures were removed during the operational life of the facilities, the BLM has maintained the historic nature of the properties. Many of the historic plantings remain at Turn Point Light Station and Patos Island Lighthouse, including fruit trees, shrubs, flowering perennials, and lawn. The BLM and its partners have completed the restoration and rehabilitation of Patos Island Lighthouse; this work is ongoing for Turn Point Light Station and its associated structures. Recent restoration and rehabilitation work approximates the mid-20th century appearance of the structures.

Map 2: Maritime heritage areas



Effects of the Alternatives

Under all alternatives, the BLM would address potential impacts to cultural resources at the design or implementation phase of future projects through National Historic Preservation Act Section 106 review. Section 106 compliance includes identification, evaluation, and mitigation of effects to properties eligible for listing on the National Register of Historic Places. The BLM would work with partners, including the SHPO and THPOs as necessary, to avoid, minimize, or mitigate potential adverse effects to National Register eligible properties. It would undertake temporary closures as necessary to protect the Monument's ecological and cultural values, as well as sensitive tribal activities where necessary.

Impacts from Shoreline Stabilization

Shoreline stabilization measures would reduce or limit erosion from large storm events along shorelines with documented maritime heritage resources. Because they are associated with aids to navigation, all three MHAs in the Monument are located within 164 feet of shorelines.

Storm events and related erosion can potentially threaten the MHAs and their adjacent shorelines. This could eventually lead to the loss of the integrity of the historic buildings, structures, associated features, and settings that contribute to the eligibility of the maritime heritage properties to the National Register of Historic Places. Information could be lost that would inform the understanding of lifeways of the light station keepers and their families on remote and isolated islands. Examples of the historic architectural and engineering design and construction techniques associated with aids to navigation could also be impacted or lost. If shoreline erosion threatens these resources, measures to stabilize shorelines could preserve the integrity of cultural deposits and historic buildings and facilities and prevent further damage to cultural and historical values from natural processes.

Given the close proximity of the MHAs to the shoreline, the BLM, in consultation with SHPO, THPOs, and other interested partners, may need to undertake shoreline stabilization to protect associated cultural properties within the life of the plan. It is not possible to identify the number or location of the shoreline treatments that may be necessary during the life of the plan, though the Coast Guard recently conducted stabilization efforts at the Cattle Point Lighthouse, which the Monument surrounds.

The effects to historic values in MHAs from shoreline stabilization are the same as those described for cultural resources in general starting on page 51 of Cultural Resources Issue 1 (see the conclusion to this issue for a summary of effects to MHAs). The exception is that, since none of the MHAs are located in areas with wilderness characteristics, both hard and soft shoreline stabilization measures would be available to protect all pertinent resources under Alternative D.

Impacts from Recreation

Objectives for recreation include protecting the Monument's objects and values from damage, alteration, or loss due to visitation. Under all action alternatives, the BLM would prohibit campfires near structures and sensitive resources, recreational use of metal detectors, and placement of physical geocaches for the protection of cultural resources including MHAs. The types of effects that recreation would have on cultural resources associated with MHAs would be similar to those described for cultural resources in general on page 53.

No Action Alternative

Under the No Action Alternative, the existing 1.23 miles of trail in MHAs would continue. Overland hiking would continue to be allowed and trail miles in more accessible grasslands and shrublands, including in the Cattle Point MHA, would likely increase over time. There would also continue to be 0.18 miles of road open to public motorized use in the Turn Point MHA; there would continue to be no roads in the other MHAs.

Use of the roads and trails would continue to have direct negative short-term to long-term impacts on MHAs and associated sites, through soil compaction, erosion via channeling of water, and widening of trails during wet periods. Under this alternative, measures to reduce impacts to MHAs and associated sites would continue but the potential for impacts from use and maintenance would grow if visitation continues to increase over the next 20 years.

Under the No Action Alternative, all MHAs would continue to be open to dispersed camping. If current recreation patterns continue, participation in this activity would remain relatively low. There would also continue to be camping in existing designated sites on Patos Island. While these designated sites are outside of the MHA, visitors participating in this activity are likely to access the MHA.

Alternative A

Under Alternative A, the BLM would facilitate use of the Monument for authorized research, and educational, cultural, and spiritual activities. The BLM would prohibit recreation on Monument lands. This alternative would minimize impacts to MHAs from human use to a greater extent than any other alternative. Traditional uses of cultural properties would continue.

The impacts from recreation described under the No Action Alternative would not continue under this alternative, though minor impacts from access for administrative and authorized uses would continue. The BLM would continue to maintain the existing 0.18 miles of road in the Turn Point MHA for authorized and administrative uses causing continued compaction, erosion, and disturbance due to maintenance and use. In all MHAs, the BLM would maintain trails as necessary for administrative and authorized uses and would allow motorized use for administrative purposes as necessary, including for the Coast Guard to access aids to navigation.

Assuming current visitation trends continue, the closure of the Monument to recreational use would increase visitation to historical and maritime heritage properties on non-Monument public lands in the

area. Specifically, this could increase visitation and impacts to Lime Kiln Lighthouse and to the San Juan Island National Historical Park, both of which are in relatively close proximity to the Cattle Point MHA.

Alternative B

Under Alternative B, all MHAs would be in RMAs and would continue to be open to recreational use. The BLM would designate the existing 1.23 miles of trail in MHAs exclusively for hiking. Hiking would be limited to designated trails or un-vegetated shoreline except for authorized purposes, which would reduce potential impacts to MHA sites outside of the designated trail routes.

There would continue to be 0.18 miles of road open to public motorized use in the Turn Point MHA. Use of roads and trails in MHAs would continue to have direct negative short-term and long-term impacts on MHAs and associated sites, through soil compaction, erosion via channeling of water, and widening of trails during wet periods.

While the BLM would not designate any new trails in MHAs, there would be new trail development on nearby lands at Patos Island. The designation of 0.74 miles of new trail on Patos Island could attract additional visitors to the area; these additional visitors would be likely to access the MHA.

Camping at existing designated sites would continue under this alternative. This would include camping in existing designated sites on Patos Island. While these designated sites are outside of the MHA, visitors participating in this activity are likely to access the MHA. The Turn Point MHA would be part of a larger RMA that would be open to dispersed camping by groups of five or more individuals by permit only. Limiting camping to small groups by permit in specified areas would reduce potential impacts to MHAs and associated sites. The Cattle Point MHA and Patos Island MHA would no longer be open to dispersed camping under this alternative.

Alternative C

Under Alternative C, all MHAs would be in RMAs and would continue to be open to recreational use. The BLM would designate 0.96 miles of existing trail in MHAs exclusively for hiking. Hiking would be limited to designated trails or un-vegetated shoreline except for authorized purposes, which would reduce potential impacts to MHA sites outside of the designated trail routes. The BLM would close 0.27 miles of trail in MHAs.

There would continue to be public motorized use of 0.09 miles of road in the Turn Point MHA. The remaining 0.09 miles of road in the Turn Point MHA would be designated exclusively for authorized and administrative use (public motorized use of this road segment is currently very infrequent). Use of the roads and trails in MHAs would continue to have direct negative short-term and long-term impacts on MHAs and associated sites, through soil compaction, erosion via channeling of water, and widening of trails during wet periods.

Under Alternative C, the BLM would prohibit camping within MHAs, which would reduce the potential for impacts. Camping at existing designated sites on Patos Island would continue. While these designated sites are outside of the MHA, visitors participating in this activity are likely to access the MHA. With the exception of Alternative A, the BLM expects that this alternative would reduce impacts from recreation to MHAs and associated sites more than the other analyzed alternatives.

Alternative D

Under Alternative D, all MHAs would be in RMAs and would continue to be open to recreational use. The BLM would designate the existing 1.23 miles of trail in MHAs exclusively for hiking. As under Alternative C, there would continue to be public motorized use of 0.09 miles of road in the Turn Point MHA, with an additional 0.09 miles of road designated exclusively for authorized and administrative use. Use of roads and trails in MHAs would continue to have direct negative short-term and long-term impacts on MHAs and associated sites, through soil compaction, erosion via channeling of water, and widening of trails during wet periods.

While the BLM would not designate any new trails in MHAs, there would be new trail development on nearby lands at Patos Island. The designation of 1.82 miles of new trail on Patos Island could attract additional visitors to the area; these additional visitors would be likely to access the MHA.

Under Alternative D, all three MHAs would be in RMAs open to designated site camping. The BLM would identify specific locations for new designated sites and visitor facilities during plan implementation. Identifying and surveying for cultural resources prior to implementation and selecting sites to avoid impacts to cultural sites would reduce potential impacts to cultural resources in those locations. Even if the BLM did not designate new sites for camping in MHAs, the designation of new sites in the adjacent Monument land would likely draw new visitors to the areas; these additional visitors would be likely to access the MHAs. MHAs would not be open for dispersed camping.

Impacts from Maritime Heritage Area Management

Objectives for MHAs vary by alternative, but managing these areas to prevent damage, alteration, or loss of cultural properties is common to all alternatives. Within the MHAs, the extent to which the BLM would allow alteration of the historic property varies across alternatives.

Very short-term (e.g., for the duration of the project) to short-term impacts to cultural properties would occur where access to or use of an MHA or associated sites would be temporarily blocked or impeded during projects to stabilize, maintain, or rehabilitate historic buildings or associated structures and features. In some cases, the effects may be long-term or permanent. Activities that disturb, alter, or destroy a portion of the property or introduce structures incompatible with the historic setting could have long-term or permanent impacts to the property and/or its historic setting.

No Action Alternative

Under the No Action Alternative, the BLM would continue custodial management of the Monument. The BLM would continue managing the cultural properties associated with maritime heritage to prevent damage, deterioration, or loss of important cultural or historical values associated with the properties.

The affected environment section describes recent actions taken by the BLM and its partners in the MHAs. Because there are no plan decisions regarding maintenance, repair, rehabilitation, or use of the structures (e.g., administrative, recreational, interpretative), some of these actions could continue to occur but extensive rehabilitation or restoration, and construction and replacement of structures, would be unlikely under the continuation of the BLM's custodial management approach.

Alternative A

Under Alternative A, the BLM would authorize projects in MHAs only as needed to prevent loss or deterioration of cultural resources, except to replace an historic structure currently present on the property in the event of its destruction (e.g., due to an earthquake or fire). Treatments would be limited to maintaining the condition and integrity of the cultural properties associated. Under this alternative, potential impacts to MHAs would be largely short-term resulting from routine basic maintenance of structures to prevent deterioration or loss. Long-term or permanent impacts could result should structural improvements or reinforcements for seismic protection measures or other improvements be necessary, which the BLM would not allow under this alternative.

Alternative B

Under Alternative B, the BLM would manage the MHAs to prevent deterioration or loss of cultural resources, protect the integrity of the setting, and restore structures to their historic appearance. The BLM would allow maintenance, restoration, and/or rehabilitation of existing historic structures. It would not authorize construction or reconstruction of structures except to replace an historic structure currently present on the property after its destruction (e.g., due to an earthquake). Projects to increase the structural stability of buildings and other structures to reduce impacts from disturbances, including sea level rise, increased storm surge, and seismic activity would be allowed.

Under this alternative, both short-term and long-term impacts would result from maintenance, hazard abatement for human health and safety, and restoration or rehabilitation of historic buildings and structures to an appropriate time period (e.g., the period of historic significance or the period of the last substantial renovation). Short-term impacts would include limitations on access and use of properties during projects; limitations on access and use would vary in duration and intensity depending on the nature of the treatments. Long-term beneficial impacts could occur from the restoration, rehabilitation, or reconstruction of historic properties within the MHAs if the treatments and reconstruction are consistent with the Secretary of the Interior's Standards for Treatment of Historic Properties. The BLM would not allow reconstruction of structures that were once present historically.

Under this alternative, short-term negative impacts would be greater than under Alternative A and the No Action Alternative. Long-term impacts that would benefit the MHAs would also be greater than under Alternative A and the No Action Alternative.

Alternative C

Activities allowed at MHAs under this alternative would be similar to Alternative B except that the BLM would allow the reconstruction of currently absent—but historically present—structures under Alternative C. It would design and approve individual reconstruction projects on a case-by-case basis, in consultation with its tribal partners, the SHPO, Coast Guard, and other community partners. The BLM would prohibit restoration, rehabilitation, or reconstruction projects that would have an adverse effect on the appearance or setting of an historic property.

Actions to restore buildings, structures, or portions of historic properties to an appropriate time period could have both short-term and long-term impacts. As in Alternative B, access and use of the properties would be limited during projects. Long-term beneficial impacts would occur from the restoration, rehabilitation, or reconstruction of historic properties within the MHAs if the treatments were consistent with the Secretary of the Interior's Standards for Treatment of Historic Properties.

With the exception of Alternative D, impact from MHA management under Alternative C would be greater than under the other alternatives. The BLM would prohibit adverse impacts to the historic setting and appearance of the historic property, reducing the potential for negative long-term impacts under Alternative C. MHA management under Sub-Alternative C would be the same as under Alternative C.

Alternative D

Under Alternative D, the BLM would manage the MHAs to prevent deterioration or loss of cultural resources, maintain the setting's historic appearance, and provide for greater use of these areas by visitors and docents. The BLM would allow maintenance, restoration, and/or rehabilitation of existing structures as well as the reconstruction of structures that were present historically. Adapting and/or modifying some structures would be allowed to facilitate greater use by visitors, including overnight use of some facilities by docents. The BLM would allow construction of new structures to facilitate recreation, education, interpretation, and facilities support. The BLM would design and approved individual reconstruction and new construction projects on a case-by-case basis through implementation-level planning, in consultation with its tribal partners, the SHPO, Coast Guard, and other community partners.

Under this Alternative, short-term and long-term impacts would be greater than under the other alternatives. As in Alternative B and Alternative C, access and use of the properties would be limited during project. The potential for numerous improvements, adaptations for reuse, construction, and visitor use under this alternative would be greater than any other alternative.

Long-term beneficial impacts to MHAs could result from the restoration, rehabilitation, or reconstruction of historic properties if these efforts are consistent with the Secretary of the Interior's Standards for Treatment of Historic Properties. Adaptive reuse could negatively affect the historic integrity and appearance of the buildings and structures as well as the historic setting unless the treatments adhere to these standards. Construction of new structures would have both long-term and short-term benefits and

long-term impacts to the historic appearance, setting, and use of the historic properties associated with the MHAs. Alternative D would have the greatest short-term and long-term impacts of any alternative.

Impacts from Vegetative Treatments

Under all alternatives, vegetation treatments within MHAs would prevent damage to cultural properties and allow needed maintenance of structures. The alternatives otherwise vary as described below. A discussion of the types of impacts vegetation management would have on cultural resources can be found on page 56.

If the BLM does not implement vegetative treatments, several impacts to MHAs could occur. Noxious weeds and invasive plants would continue to increase and encroach on the landscape both within and outside of the MHAs and would have a long-term impact on the historic setting. The character of the vegetation in the MHAs could change, affecting the historic setting (e.g., forest species or woody shrubs could overrun grassland in the MHAs). Trees and woody shrubs could pose a variety of threats to historic structures, including from falling limbs and increased fire risk.

No Action Alternative

Under the No Action Alternative, the BLM would continue custodial management of the Monument; the BLM assumes it would continue very limited vegetation treatments in the MHAs. Over time, continued encroachment by weeds, invasive species, or forest species may diminish the historical landscape and historic setting. The BLM would continue to assess and treat potential hazard trees around historic structures to reduce potential impacts from tree fall on those properties. This alternative would have the least potential for vegetation treatments to impact cultural resources. The condition and integrity of the historic setting would continue to be impacted by limited vegetation treatments under this alternative.

Alternative A

Under Alternative A, management of vegetation would continue to be largely passive. The BLM would authorize vegetation treatments only as needed to prevent damage to cultural properties and to allow needed maintenance of structures. It would not allow the use of chemical treatments (e.g., herbicides) to achieve cultural resource objectives. Given that natural processes would be allowed to continue and treatments would only occur as needed to prevent damage to the cultural properties associated with the MHAs, the potential for direct impacts to cultural resources from vegetation treatments would be limited.

Encroachment by native forest species into the MHAs would continue and the condition of the historic vegetation associated with the MHAs would likely decline over time as a result of invasive plant treatment being undertaken in the absence of herbicides. As under the No Action Alternative, the integrity and condition of the vegetation in the historic setting would continue to decline.

Alternative B

Under Alternative B, the BLM would manage vegetation to minimize risk to cultural resources from fire and other disturbance. This may include undertaking projects to remove fuels and potential hazard trees around historic structures even where this is not in keeping with the historic appearance of the property. Under this alternative, the BLM would consider a full range of vegetation treatment tools in designing implementation-level treatments. Some chemical herbicidal applications may have short-term or long-term impacts to traditional plant gathering activities that may occur within the MHAs.

The magnitude and intensity of vegetation treatments would increase the potential for short-term and long-term or permanent impacts to cultural resources from disturbance, chemical treatments, and fire. Treatments to minimize risk to MHAs from wildfire or other disturbances would have the potential to inadvertently disturb or destroy artifacts, cultural features, historic plants and vegetation, and damage historic structures contained within the treatment area. Very short-term (i.e., duration of the project) effects from vegetation treatments that temporarily block or impede access to or use of the cultural property or that would temporarily affect the historic setting would be most likely under this alternative.

Historic buildings and structures in the MHAs would be better protected from wildfire and other disturbances in this alternative compared to the other alternatives. However, the potential for long-term or permanent impacts from damage or destruction of historic and cultural structures and features, and historic setting from vegetation treatments are also greater under this alternative than under the No Action Alternative and Alternative A, Alternative C, and Alternative D. Identification and survey prior to implementation and designing treatments to minimize or avoid adverse impacts to MHAs and associated sites would reduce potential impacts from vegetation treatments.

Alternative C and Alternative D

Under Alternative C and Alternative D, the BLM would manage vegetation in MHAs to protect the integrity of the historic setting. This may include maintaining and cultivating historically appropriate trees, shrubs and ornamental and edible plants and controlling encroaching forest species and non-native plants not in keeping with the historic setting.

As in Alternative B, the BLM would consider a full range of vegetation treatment tools in designing implementation-level treatments. Some chemical herbicidal applications may have short- or long-term impacts to traditional plant gathering activities that may occur within the MHAs. Prescribed fire would be unlikely to occur within MHAs due to potential risks to the historic properties from fire.

The magnitude and intensity of the vegetation control and restoration measures would increase the potential for short-term and long-term impacts to MHAs and associated properties from disturbance, chemical treatments, and fire. Treatments to maintain the integrity of the setting resulting in ground disturbance would have the potential to inadvertently disturb or destroy artifacts, cultural and historic structures and features, historic plantings, and vegetation within the treatment area. Implementation-level vegetation treatments to renovate, restore, or maintain healthy historic plantings would generally have short-term (weeks to months) and long-term (year to the life of the plan) effects beneficial to maintaining the integrity of the landscape setting. Very short-term (e.g., duration of the project) to short-term impacts from vegetation treatments that temporarily block or impede access to or use of the cultural property or that would affect the historic setting would be more likely under Alternative C and D than under the No Action Alternative and Alternative A, but less likely than under Alternative B.

The BLM would manage hazard trees to protect human health and safety and the condition and integrity of the historic buildings and structures. The integrity of the plantings and vegetation in MHAs and associated cultural properties would be better protected under Alternative C and Alternative D but the condition of the historic buildings and structures would be better protected from fire and other disturbances under Alternative B. The potential for long-term or permanent impacts from damage or destruction of artifacts, cultural features, and vegetation within the historic setting would also be less under Alternative C and Alternative D than under Alternative B and greater than under the No Action Alternative and Alternative A.

Sub-Alternative C

Under Sub-Alternative C, the BLM would manage vegetation in MHAs to protect the integrity of the historic setting but would prohibit the use of chemical treatments (e.g., herbicides). Effects to cultural resources from vegetation treatments would be similar to those under Alternative C but greater in magnitude. Without the use of herbicides, the BLM would likely need to increase the number of mechanical treatments to maintain the integrity of the historic setting. Short-term and long-term (years to life of the plan) negative impacts related to ground disturbance, and prescribed fire would be similar to but somewhat greater than those described under Alternative C. Without the use of pesticides, some plantings of historic vegetation may not thrive or recover from disease or infestations.

Conclusion for Cultural Resources Issue 2

The alternatives would vary in their effects on MHAs and associated cultural properties within the Monument. Specifically, they would vary in terms of the stabilization tools available to the BLM, the

potential for short-term and long-term effects from disturbance related to recreational activities and vegetation management, and the extent to which the BLM would allow the restoration, rehabilitation, and rebuilding of structures in the MHAs.

Stabilization of MHAs threatened by erosion and storm surges would likely be most effective under Alternative B, Alternative D, and the No Action Alternative, where the full range of shoreline stabilization measures would be available for MHAs. However, there would be greater impacts to the historic settings of any MHAs in which the BLM applied hard stabilization measures. Soft shoreline stabilization measures would be available to protect MHAs under all of the alternatives where it is determined likely to be effective.

Under both the No Action Alternative and Alternative A, the BLM would continue a custodial management approach to MHAs; these alternatives would have a minimal impact on the historic settings though long-term impacts could occur from passive management. Potential negative impacts to the historic setting of MHAs or to the potential archaeological or cultural values of the associated maritime heritage properties from restoration, rehabilitation, and reconstruction, would be greater under Alternative C than under the other alternative except Alternative D. However, the BLM would prohibit adverse impacts to the historic setting and appearance of the historic property, reducing the potential for negative long-term impacts under Alternative C.

Under Alternative D, short-term and long-term impacts to the historic setting of MHAs or to the potential archaeological or cultural values of the associated maritime heritage properties from restoration, rehabilitation, reconstruction, and new construction would be greater than under the other alternatives. Adapting existing structures or building new ones to facilitate recreation, education, interpretation, and facilities support would have both long-term and short-term benefits for increasing visitor engagement in the history of the area, but would likely have long-term or permanent impacts to the historic appearance, setting, and use of the historic properties associated with the MHAs.

The potential for negative impacts to the historical setting of MHAs from vegetation treatments would be greatest under Alternative B. Reducing fuels and hazard trees under this alternative would change the historical setting of the MHA, but would also reduce the risk for damage or loss of sites and structures. Passive vegetation management under the No Action Alternative and Alternative A would cause minimal disturbance, but the continued presence and/or spread of invasive plants and forest species could have a negative impact on the historic setting. Under Alternative C and Alternative D, the potential for disturbance of the cultural properties from vegetation treatments would be less than under Alternative B; the BLM would manage vegetation to benefit the historical setting of each MHA. Sub-Alternative C would have similar results, but would require more frequent disturbance to achieve objectives without the use of chemical treatments (e.g., herbicides). Repeated ground disturbance could increase potential long-term impacts to maritime heritage properties.

Cumulative effects of alternatives on Maritime Heritage Properties in the San Juan Islands

The Monument includes two of the four lighthouses located in the San Juan Islands. The BLM, in consultation with its tribal partners, the SHPO, Coast Guard, and other community partners, have actively cooperated to maintain and protect the lighthouse properties on or surrounded by Monument land. The BLM and its community partners have worked to recover the historic condition and appearance of the buildings and structures that remain at the historic light stations after years of weathering, deterioration, and disrepair. Public education and interpretation activities offered by the BLM's community partners at both Turn Point Light Station and Patos Lighthouse have continually improved and expanded visitor experiences at these historic aids to navigation facilities.

The two lighthouses located outside of the Monument are both on San Juan Island and are owned and operated by the Coast Guard (at Cattle Point) and by Washington State Parks (Lime Kiln). Only the Lime Kiln Lighthouse provides public education and interpretation outside of the lighthouses managed by the

BLM. Surrounded by Monument land, both this historic setting and the recreational use of the Cattle Point Lighthouse is directly affected by the BLM's management of vegetation and recreation.

Past development and both natural and cultural processes have resulted in the current condition of maritime heritage properties. Prior to the BLM's administration of the Monument, maritime heritage properties were adversely impacted by shoreline erosion, natural deterioration, wildfire, construction, demolition, and maintenance. Construction and maintenance of aids-to-navigation facilities, including fog signals/light stations and ancillary buildings and structures, likely were not consistent with the Secretary of the Interior's Standards for Treatment of Historic Properties. Construction and maintenance of roads, trails, and recreational development, in addition to vandalism, and looting likely have contributed to adverse impacts to maritime heritage properties.

The BLM has minimized impacts to maritime heritage properties from construction and maintenance within the Monument. Working with partners, it has stabilized, protected, and rehabilitated light station facilities. The BLM has implemented measures to reduce the potential for loss or alteration of maritime heritage properties from erosion, natural deterioration, and visitor use.

Decisions made under this planning effort would affect two-thirds of the historic lighthouse facilities in the planning area. The BLM assumes that management of the Lime Kiln Lighthouse, which is a popular destination for both maritime heritage appreciation and whale watching, would remain unchanged during the life of the plan.

The alternatives would vary in how the Monument would contribute to the protection of maritime heritage resources in the San Juan Islands, as well as to the supply of such resources that would be available for casual visitation and appreciation. Under the No Action Alternative and alternatives A, B, and C, there would likely be limited negative impacts to the historic appearance and setting of the MHAs though potential impacts from vegetation treatments would be greater under Alternative B. Under Alternative D, construction of new structures to facilitate recreation, education, interpretation, and facilities support would have the potential for long-term negative impacts to the historic appearance and setting of the MHAs. Unless these impacts were adequately mitigated, this could reduce the overall contribution of maritime heritage resources with a high-level of historic integrity, feeling, and association of maritime heritage properties in the San Juan Islands.

Under Alternative A, members of the public could visit the MHAs for educational, scientific, cultural, or spiritual purposes, but not for recreational activities. This would reduce by half the maritime heritage resources in the San Juan Islands available for casual visitation and appreciation. Under the other alternatives, the Monument's contribution to the supply of maritime heritage resources in the San Juan Islands available for casual visitation and appreciation would remain unchanged.

Education and Interpretation

Key Points

- Under all action alternatives, the BLM would develop an implementation-level Interpretation and Education Plan.

This section contains one analytical issue:

1. How would the alternatives affect education and interpretation within the Monument? (Page 70)

Education and Interpretation Analytical Issue 1: *How would the alternatives affect education and interpretation in the Monument?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Proclamation 8947 describes the Monument as "a refuge of scientific and historic treasures and a classroom for generations of Americans." This description is borne out by the current use of the

Monument for numerous educational programs. In 2016, BLM staff, partners, and volunteers hosted 5,599 hours of general educational and interpretative programs associated with the Monument, which reached over 3,733 participants. There were also 1,755 hours of educational and interpretative programs specifically targeted at youth, which reached over 1,170 young people. Approximately half of these educational and interpretative programs took place in communities in the San Juan Islands rather than the Monument. See the Education and Interpretation section in Appendix E for a description of some of these programs.

Table 5: Current interpretive and informational displays within the Monument

Monument Location (s)	Current Interpretive and Informational Displays within the Monument
Cattle Point (San Juan Island)	Three interpretive panels; one informational kiosk.
Patos Island	Free standing panels within the lighthouse
Turn Point Light Station (Stuart Island)	Interpretive museum in the fog signal building. Interpretive panels in the oil house. Interpretive information in the keeper's quarters.
Chadwick Hill (Lopez Island), Point Colville (Lopez Island), Watmough Bay (Lopez Island), Iceberg Point (Lopez Island), Blind Island, Posey Island	Informational Kiosks

Currently, permits are required for organized groups of 10 or more in the 503 acres in the ACECs (Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay). Outside of these areas, organized groups are required by regulation to obtain a special recreation permit from the BLM but no size threshold has been established.

Much of the non-BLM-administered public land within the San Juan Islands provides relatively minimal on-site educational and interpretive signage. More actively interpreted visitor experiences are available at several locations, including but not limited to the San Juan Island National Historic Park (San Juan Island), Lime Kiln Point State Park (San Juan Island), Moran State Park (Orcas Island), Heritage Trust Resource Center: Otto Preserve (Lummi Island), and Fishermans Bay Spit (Lopez Island).

Effects of the Alternatives

Under all alternatives, educational and interpretive programs would continue within the Monument. The BLM would develop an implementation plan addressing how the agency, working with its partners, would develop educational and interpretive programs and materials—including those that would be available online—around various themes, including, but not limited to those listed in Appendix J.

The impact of the alternatives on education and interpretation would vary in one primary way. Decisions related to signs would affect the delivery of interpretive and educational messages within the Monument. Under all alternatives, the BLM would establish signage as necessary to protect human health and safety, and prevent resource damage. The wording and placement of signs would be determined during plan implementation.

No Action Alternative

Under the No Action Alternative, the BLM would continue to develop educational and interpretive signs on an ad hoc basis. Table 5 describes current interpretive and informational displays. Given the current custodial approach to management, there would likely continue to be minimal educational and interpretive signs. There would be no education and interpretive plan guiding the development and placement of these signs.

Educational and interpretive programs would likely continue at approximately the current level and with the current restrictions (as described under the affected environment for this section).

Alternative A

Under Alternative A, the BLM would not develop any additional interpretive or educational signs within the Monument. The BLM would establish signs only as necessary to protect human health and safety and prevent resource damage. This would limit the ability of the BLM to provide educational and interpretive messages directly on the landscape. The BLM could continue to provide this information online and in printed formats distributed outside of the Monument and through in-person programing.

Under this alternative, public access to the Monument would be limited to authorized access for research, educational, cultural, and spiritual uses. All non-BLM sponsored educational and interpretive programming within the Monument would require written authorization from the BLM. The authorization requirement might cause some decrease from the current level of programing within the Monument. There would also be a reduction in competing uses of the Monument and educational and interpretive experiences during what are currently higher visitation periods could improve.

Alternatives B

Under Alternative B, the BLM would limit development on the landscape by installing signs beyond trailheads and landing sites only as necessary to provide directional information and to protect Monument objects and values and human health and safety. This would create an opportunity to provide additional educational and interpretive information at the entry points to the Monument. The prohibition on interpretive and educational signage within the remainder of the Monument would limit the ability of the BLM to provide these types of messages directly on the landscape. The BLM could continue to provide this information online and in printed formats distributed outside of the Monument.

Certain locations within the Monument would also require authorization for public access for all group sizes[37]. This restriction would benefit these programs by ensuring exclusive access to these locations for educational and interpretive experiences.

Alternatives C and D

Under these alternative, the BLM would allow the installation of interpretation and education signage on the landscape. This would create an opportunity to provide educational and interpretive messages about the Monument's objects and values at key locations throughout the landscape. The BLM could continue to provide this information online and in printed formats distributed outside of the Monument.

Conclusion

The alternatives would have limited effects on educational and interpretive programs within the Monument. Alternatives A and B would have the most restrictive approaches to both educational and interpretive signage. Alternatives C and D would allow for additional educational and interpretive signs.

Cumulative Effects of the Interpretation and Education in the San Juan Islands

The Monument includes approximately 4 percent of public lands in the San Juan Islands; the majority of the remaining 96 percent of public lands provide or are available for some level of educational and interpretive opportunities. The BLM is not aware of any management changes that would alter this situation in the foreseeable future. Under all alternatives, the BLM would continue to sponsor and coordinate educational and interpretive programming in the San Juan Islands.

The alternatives would have limited impacts on educational and interpretive messaging and programing within the Monument; similarly, they would have a limited impact on the cumulative educational and interpretive messages and programming available in the San Juan Islands.

[37] Broken Point Island, Carter Point, Fauntleroy Rock, Kellett Bluff, Little Patos Island, Lopez Pass, Lummi Rocks, McConnell Rocks, Mud Island, Oak Island, Parks Bay Island, President Channel, Reads Bay Island, Richardson Rocks, Twin Rocks

Habitat and Plants

Key Points

- Without management action, forest species would continue to encroach on grasslands and shrublands within the Monument. Both the quality and size of Monument grassland and shrublands would continue to decline. Forest communities would also become increasingly crowded and canopies would continue to close.
- Under alternatives B and C, the BLM would expand the extent of grasslands and shrublands within the Monument and manage for a more open canopy within remaining forests and to enhance the cover and diversity of native plant communities.

This section contains six analytical issues:

1. How would each alternative affect the extent of vegetative communities? (Page 73)
2. How would each alternative affect the condition of each vegetation plant community? (Page 77)
3. How would the alternatives vary in the approximate extent and type of vegetation treatments that would be applied during their implementation? (Page 110)
4. How would the alternatives affect special status plants and lichen and Washington Natural Heritage Program priority ecological communities? (Page 117)
5. How would the alternatives affect invasive plant species presence and spread within the Monument and the San Juan Islands? (Page 130)
6. How would use of chemical treatments (e.g., herbicides) affect non-target resources including vegetation, human health and safety, water quality, wildlife, and soils? (Page 136)

This section addresses the Monument's habitats and plant communities; wildlife that depend on those communities are addressed in the Wildlife section.

Habitat and Plants Analytical Issue 1: *How would each alternative affect the extent of vegetative communities?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The BLM mapped vegetative communities within the Monument using the Landscape Fire and Resource Management Planning Tools (LANDFIRE) vegetation classification (NatureServe 2009). The LANDFIRE classifications describe terrestrial ecological systems, which are plant community types (plant associations and/or alliances) that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients (NatureServe 2009). The LANDFIRE program of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior have linked their classification systems based on NatureServe's Ecological Systems to the group and macrogroup levels of the National Vegetation Classification, which allows National Vegetation Classification plot data to contribute to LANDFIRE's nationwide mapping efforts (USNVC 2017).

This analysis describes plant communities within the Monument using the National Vegetation Classification's class and macrogroup scales. Table 6 includes the five macrogroups that occur within the Monument, along with the two broader vegetation classes into which they fall. A given macrogroup may include a broad range of vegetative conditions, from areas with an intact native plant community to areas that are dominated by introduced vegetation.

Table 6: Current extent of vegetation classes and macrogroups occurring in the Monument

Class	Macrogroup	Monument Acres	San Juan Islands Acres	Percent of total vegetation type in islands in the Monument
Forest & woodland	Southern Vancouverian Dry Foothill Forest	241	32,325	<1%
	Wetland: Vancouverian Flooded & Swamp Forest	3	299	1%
	Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens Forest	603	41,826	1%
Grassland & shrubland	Southern Vancouverian Lowland Grassland & Shrubland	126	10,474	1%
	Wetland: Vancouverian Lowland Wet Shrubland, Wet Meadow, and Marsh	39	717	5%
Unknown–bare rock		9		

Forest and Woodlands

Forest and woodlands cover more than 800 acres of the Monument, making them the largest vegetation class addressed by this plan. The current lack of fire and other disturbance on the landscape is allowing forest species to encroach into grasslands, causing conversion to forest over time (Kruckeberg 1991).

Across the San Juan Islands, tree density has increased relative to conditions existing prior to Euro-American settlement due to a lack of disturbance (Sherck 2013, Bakker et. al. 2016, Spurbeck and Keenum 2003, Gray and Daniels 2006, U.S. Congress 1867). Currently, throughout the islands, dense forest vegetation fragmented by housing and associated small clearings is common.

Grassland and Shrubland

There are approximately 126 acres of non-wetland grassland and shrubland within the Monument. This vegetation class is found scattered throughout the Monument, but the majority of the acres addressed by this plan are within the Iceberg Point and Point Colville properties at the south end of Lopez Island.

Throughout the Puget Lowland Ecoregion, which includes the San Juan Islands, both native and non-native grasslands are at an estimated 9 percent of pre-Euro-American settlement levels (Chappell et al. 2000).

Wetlands

The approximately 42 acres of wetland in the Monument comprise the Vancouverian Flooded and Swamp Forest macrogroup and the Vancouverian Lowland Wet Shrubland, Wet Meadow, and Marsh macrogroup in Table 6. The size of these wetlands has been relatively stable for decades. The limited freshwater resources of the San Juan Islands as a whole enhance the importance of the Monument's limited wetlands.

All freshwater wetlands within the Monument are on Lopez Island. At approximately 30 acres, Chadwick Marsh is the largest of the Monument's wetlands. The freshwater wetland behind Watmough Bay is approximately 5 acres and the forested wetland at Point Colville is approximately 2 acres. Monument lands on Lopez Island support an additional acre of identified scrub-shrub wetland and emergent and open water wetland areas, and <0.5 acres of identified palustrine (freshwater) forested wetlands.

Over time, the size of the Point Colville wetland may shrink due to encroachment by forest vegetation, though this decline is likely to be slow. Under current conditions, the extent of the remaining forested wetlands (Flooded and Swamp Forest macrogroup) and emergent wetlands (Wet Shrubland, Wet Meadow, and Marsh macrogroups) is likely to remain static due to their hydrologic conditions.

Patos Island supports one known habitat area with wetland plants and seasonally ponded water (approximately 1 acre in size). However, this area does not support hydric soils (i.e., soils seasonally or permanently saturated by water), and thus does not meet the Clean Water Act definition of a wetland.

The BLM has not identified any lotic (flowing) riparian systems within the Monument. Although several stream segments occur within Monument lands on Lopez Island, these segments are either inundated by ponded and wetland areas (Chadwick Marsh) or are no longer active (connection between Watmough Bay Wetland and Watmough Bay). Mesic (i.e., moderately moist) areas in forest and woodlands within the Monument may support some riparian species (e.g., red alder (*Alnus rubra*) and willow (*Salix scoulerii*)) and mesic microclimates, but do not have defined scour or flowing water associated with streams. There are no 303(d) water bodies within the Monument.

There have been historic losses of wetlands in San Juan County associated with human development (landings, harbors, docks, and housing); these losses have not been accurately quantified, but have led to the development of land use ordinances protecting wetlands (Rozenbaum 2012). More recently, approximately 20 percent of the wetland resources in the San Juan Islands have been classified as potentially disturbed (based on data in WDOE 2011b).

Effects of the Alternatives

The alternatives would vary in their effects on the extent of each vegetation class and macrogroup in the Monument over the next 20 years. Under the No Action Alternative and Alternative A, these effects would be driven by the continued encroachment of forest vegetation in grasslands and shrublands coupled with minimal active management. Under alternatives B, C, and D, these effects would be driven by the implementation of projects over the life of the plan to meet each alternatives' objectives (see Table 7).

Table 7: Comparison of estimated acres of vegetation class after 20 years under each alternative

Class	Macrogroup	2016 Acres (acres)	No Action Alternative/ Alternative A (acres)	Alternative B (acres)	Alternative C (acres)	Alternative D (acres)
Forest & woodland	Southern Vancouverian Dry Foothill Forest	241	246	119	138	242
	Wetland: Vancouverian Flooded & Swamp Forest	3	3	5	3	3
	Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens Forest	603	615	298	345	603
Grassland & shrubland	Southern Vancouverian Lowland Grassland & Shrubland	126	109	520	487	126
	Wetland: Vancouverian Lowland Wet Shrubland, Wet Meadow, and Marsh	39	39	70	39	39
Unknown –bare rock		9	9	9	9	9

No Action Alternative

Under the No Action Alternative, the BLM would continue to provide custodial management of the Monument's habitats and plant communities. Assuming continuation of current trends, this would mean approximately 20 acres of vegetation treatment per year to address hazard trees and non-ground disturbing invasive plant treatments. This analysis assumes that the BLM would continue not to remove encroaching forest vegetation in areas of the Monument classed as grasslands and shrublands.

With continued custodial management, the extent of areas classed as grassland and shrublands would continue to shrink due to encroachment by forest species over 20 years (see Table 7). The grasslands and shrublands vegetation class would decrease by approximately 13 percent. The forest and woodlands vegetation class would increase by approximately 2 percent.

Alternative A

Under Alternative A, the BLM's objective would be to allow natural succession to take place to the extent possible while maintaining the diversity of plant communities described in Proclamation 8947. The BLM projects that Alternative A's thresholds for triggering management to maintain the extent of plant communities (see page 17) would not be crossed within the next 20 years. As a result, the BLM would be unlikely to remove encroaching vegetation and the estimated extent of plant communities and macrogroups within the Monument would be the same in Alternative A as in the No Action Alternative.

Alternative B

Under Alternative B, the BLM's objective would be to enhance the area's ecological resilience and resistance, including by increasing the extent of the native plant communities (specifically grasslands and wetlands) that are relatively scarce within the San Juan Islands as a whole. To achieve this objective, the BLM —likely working with tribes and other partners—would undertake vegetation treatments to enhance the acreage of grasslands and wetlands to the extent possible given site conditions. As is the case in Alternative C, this would more closely approximate the plant communities that would have been maintained through management of the landscape using fire prior to 19th Century Euro-American settlement.

Through active management of currently forested areas identified by BLM specialists as having the potential to be grasslands and shrublands and wetlands, the extent of plant communities within these classes would increase substantially over the life of the plan (see Table 7). Over 20 years, the extent of the grassland and shrubland vegetation class, which includes tree savanna, would increase by approximately 313 percent (from approximately 12 percent of the Monument to approximately 51 percent of the Monument). The extent of the forest and woodlands vegetation class would decrease by 51 percent (from 83 percent of the Monument to 41 percent of the Monument). The extent of wetlands would increase by 79 percent (from 4 percent of the Monument to 7 percent).

Alternative C

Under Alternative C, the BLM's objective would be to manage vegetation within the Monument to approximate the extent and condition of plant communities existing prior to Euro-American settlement when Native American/Indigenous Peoples managed the landscape using fire. This would require the BLM—likely working with tribes and other partners—to undertake vegetation treatments to increase the extent of acres in the grassland and shrubland class, which includes tree savanna, to approximate what it might have been prior to Euro-American settlement.

Through active management to restore grasslands and shrublands to their approximate pre-European settlement extent, the extent of plant communities within these classes would increase substantially over the life of the plan. Over 20 years, the extent of acres in the grassland and shrubland class, which includes tree savanna, would increase by approximately 287 percent (from approximately 12 percent of the Monument to approximately 48 percent of the Monument). The extent of the forest and woodlands class would decrease by approximately 48 percent (from approximately 83 percent of the Monument to approximately 47 percent of the Monument). The extent of wetlands would remain unchanged.

Alternative D

Under Alternative D, the BLM's objective would be to maintain the approximate current (2016) extent of vegetation classes within the Monument. This would require the BLM—working with tribes and other partners—to undertake vegetation treatments at the edges of grasslands and shrublands to prevent conversion to forest and woodlands.

Through active management to maintain grasslands and shrublands, the extent of plant communities within these classes would remain at their approximate 2016 extent instead of decreasing over the life of the plan as they would under the No Action Alternative (see Table 7).

Conclusion

The alternatives would vary in their effects on the extent of vegetation classes within the Monument. Acres in the grassland and shrubland vegetation class, which includes tree savanna, would increase substantially under alternatives B and C, and would continue to decline in extent under the No Action Alternative and Alterative A. Forest and woodlands would decrease substantially under alternatives B and C, and would continue to increase in extent under the No Action Alternative and Alternative A. Wetlands would remain static in size, except under Alternative B, under which they would increase in size. Under Alternative D, all vegetation classes would continue to occupy approximately the same percent of the Monument as under current conditions.

Cumulative effects of the alternatives on plant communities in the San Juan Islands

See cumulative effects under Habitat and Plants Issue 2 for a discussion on the effects of the alternatives on the cumulative extent and condition of plant communities in the San Juan Islands.

Habitat and Plants Analytical Issue 2: *How would each alternative affect the condition of each plant community?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Forest and Woodlands

This sub-section addresses the Southern Vancouverian Dry Foothill Forest and *Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens* forest macrogroups in Table 6. The Vancouverian Flooded and Swamp Forest macrogroup is addressed under wetlands, below.

Forests and woodlands within the Monument, as well as in the San Juan Islands in general, are shaped by the area's varying precipitation levels, as well as by the level of disturbance (e.g., wildfire, disease, vegetation management). These factors influence both species composition and community structure (e.g., closed or open canopy, density of undergrowth). This sub-section describes the structure of the Monument's forests and woodlands and how this has changed over time, the status of large and old trees within the Monument, and the species composition of the area's moist and dry forests.

Forests and woodlands within the Monument are shaped by the area's precipitation levels (in addition to the soils and aspect of individual locations), which vary from a low of 17 inches on the southern end of Lopez Island to 29 inches on Patos Island. This change in precipitation is due to the rain shadow effect of the Olympic Mountains to the south. Most soils in the San Juan Islands are shallow, and droughty conditions are common in the summer.

Plant Community Structure

The lack of recent fire and other disturbance has caused open canopy communities, including tree savannas and woodlands, to convert to closed canopy forests over time due to increasing tree density (Kruckeberg 1991). Dunwiddie et al. (2011) estimated the historical tree density on Waldron Island was about 1/10 of the current density. The rate of encroachment, infill, and shrub expansion varied from island to island (Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011). Currently, according to BLM specialists, all oak habitat within the Monument is woodland rather than savanna[38] (i.e., the tree density is too high to be considered savanna).

[38] According to the BLM Forest Inventory System, savanna has less than 10 percent tree cover. Oak habitat with more than 10 percent tree cover is considered oak woodland.

Forests and woodlands are often categorized into succession classes, which describe their percent cover, height, and species composition. The BLM identified succession classes within the Monument using the LANDFIRE succession classification (NatureServe 2016). Currently, nearly 90 percent of the Monument's forests have a closed canopy (see Table 8). Based on the fire studies and historical descriptions referenced above, a higher percentage of forests and woodlands within the Monument, and within the San Juan Islands, would have historically been in either succession class A or C, which feature open canopies, or in succession class E.

Table 8: Current acres of succession classes within the Monument

Succession Class	Monument Forest and Woodlands in Succession Class (Percent)	Class Description	Canopy
A (Open Forest)	3%	Post-stand replacement community composed of herbs, shrubs, and young trees. Succession to class B after 20 years. For the Monument, most succession class A has developed from encroachment of forest species into grasslands.	Single layer of trees in canopy <10 % tree cover
B (Closed Forest)	52%	Closed-canopy young forest stands with trees averaging 10" in diameter and 65 feet in height. Understory tends to be minimal because of low light levels. Succession to class E after 80 years.	>35% tree canopy cover. One to two upper canopy layers
C (Open Forest)	8%	Young forest stands opened up by mixed-severity fire or, on moist sites, by wind-throw or root-rot. Trees average 10-12" in diameter and 65-80 feet in height. Shrubs dominate the understory. Succession to class D or E after 80 years.	<35% tree canopy cover. One upper canopy layer.
D (Open Forest)	1%	Mature to old-growth forest stands opened up by mixed-severity fire, or on moist sites, opened up by wind-throw and root-rot. Largest trees are greater than 20" in diameter. Canopy opening may be sufficient to permit shade-intolerant species or may only permit shade-tolerant species. This class has a diverse understory with essentially the same species as class E. Succession to class E after 50 yrs.	> 35% tree canopy cover. One upper canopy layer and up to one to three size classes in this layer.
E (Closed Forest)	37%	Mature to old-growth forest stands dominated by large individuals (>20" in diameter). Understories can be a mix of shade tolerant shrubs and herbs. Forest will maintain in class E until a stand replacement disturbance.	> 35% tree canopy cover. Multiple upper canopy layers

Source: Landfire 2016

Large, Old Trees

In the 19th Century, the Federal government withdrew much of the land now included in the Monument for lighthouse development, including Cattle Point, Iceberg Point, Kellett Bluff, Patos Island, Point Colville, and Turn Point. Except for areas cleared for lighthouses, logging did not take place within these much of these lighthouse reservations. Because of this, large and old trees occur on Patos Island, Iceberg Point, and Point Colville. The BLM estimates the age of some of these trees at well over 300 years.

The large and old trees that occur within the Monument initially grew in more open conditions than currently exist. Frequent disturbances including fire, insects and disease, and weather events ensured adequate growing space for these trees. The relative absence of fire on the landscape over the last

hundred years has allowed large numbers of new trees to become established. Competition from these new trees is causing stress in older stands and individual large and old trees. The increasing density of trees, along with the stressed older trees, creates conditions that are susceptible to future severe fire (Brown et. al. 2004), insect and disease outbreaks, and susceptibility to weather/climate events. There is currently no management intervention to address this trend.

Except at Point Colville, Iceberg Point, and Patos Island, stands of large and old trees are relatively scarce in the Monument. More common are individual trees and small stands that have old tree characteristics, including old crown and branch pattern characteristics, crown form and vigor, thick bark with wide plates and coloring indicative of old bark (relative to each species), sometimes (but not always) large size, and an age that is near the upper portion of the maximum biological age for that species or site (Van Pelt 2007). Some individuals also have some form of internal decay or branch dieback (Van Pelt 2007).

Dry Forest Species Composition

Dry forests classified as North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest are the most extensive forest type in the Monument, occurring at Point Colville, Chadwick Hill, Iceberg Point, Kellett Bluff, and Turn Point. These forests include Douglas-fir (*Pseudotsuga menziesii*), grand fir *(Abies grandis)*, Pacific madrone (*Arbutus menziesii*), lodgepole pine (also known as shore pine) (*Pinus contorta*), Garry oak (also known as Oregon white oak) (*Quercus garryana*), seaside juniper (*Juniperus maritima*), quaking aspen (*Populus tremuloides)*, and other hardwoods. Dry forest sites are usually located on rocky, steep, south facing slopes. The understory is mostly grasses and forbs, though due to a lack of disturbance Douglas-fir are becoming a more prominent component of the understory.

Several of the dry forest species and vegetative communities within the Monument are considered ecologically important, including Garry oak and seaside juniper. For example, the transition area between the grasslands and Douglas-fir forest on Lopez Island at Point Colville and Iceberg Point has been described as one of the finest examples of this type of habitat in the region (Dougherty 2004).

Several BLM funded studies have found that there has been a departure from historic dry forest conditions within the Monument (Dougherty 2004, Gray 2006, Spurbeck and Keenum 2003, Sherck 2013). These studies show that dry forests in the Monument have a history of frequent disturbance by wildland fire that is similar to low elevation eastern Washington forests (Spurbeck and Keenum 2003). The fire return interval on the southern end of Lopez Island was found to be 11 to 14 years over a 340-year-period, but the last recorded fire in this area was in 1916 (Spurbeck and Keenum 2003).

The increasingly closed forest conditions are causing a decline in several dry forest species, including Garry oak, madrone, seaside juniper, and aspen. Garry oak occur in limited locations in the San Juan Islands; within the Monument, they are mostly found at Kellett Bluff (Henry Island) and a few other scattered locations. Sherck (2013) cited a number of sources indicating that mature oak trees initially grew in more open conditions. Pre-settlement oak habitat was characterized by relatively open canopies dominated by trees with full, mushroom-shaped crowns (Vesely and Tucker 2004). This translates to tree densities that vary with age but would eventually range from 25 to 50 trees per acre with a canopy closure of 25 to 50 percent. Currently, many of these areas have canopy cover of between 50 and 90 percent (Landfire 2016). Without management intervention, the decline of Garry oak would continue. Changing forest conditions threaten oak woodlands by throughout the Northwest (Livingston et al. 2016).

Seaside juniper occurs in scattered locations throughout the Monument and has also declined due to changes in disturbance patterns in the San Juan Islands (MacDonald and Nakae 2015). Seaside juniper, which was identified as a species endemic to the Pacific Northwest in 2007 (MacDonald and Nakae 2015), grows as single trees and in small groups in granitic or sandy soils.

Aspen stands in the San Juan Islands were also once more abundant than today. Aspen occur as individuals and in small clumps; they grow best in deep, moist loamy soils in a range of precipitation zones (16 to 40 inches). Aspen stands often contain a mixture of age classes with a skirt or fairy ring of

regeneration around the edge of the stand (Shepperd et.al. 2001). This regeneration results from root sprouting that would occur from full sunlight reaching the ground and a lack of competing vegetation. Historically, fire, insects, and disease benefitted aspen by keeping encroaching vegetation from outcompeting aspen and by creating conditions that allowed aspen to regenerate by sprouting. The reduction of fire and other disturbances on the landscape has created conditions that are less favorable for aspen regeneration.

The reduction in fire incidence in the San Juan Islands has also degraded conditions for Pacific madrone by increasing competition for sunlight, water, and nutrients on many sites. Madrone dieback has been recently occurring on the San Juan Islands (Mehmel 2006). This dieback is a result of overhead shading from conifers and side-shading from conifers and other tree species.

Moist Forest Species Composition

Moist forests are extensive on Patos and Little Patos islands, which are the northern most locations in the Monument. On Patos and Little Patos islands, precipitation levels can reach 29 inches per year. The southern San Juan Islands receive less precipitation; in these areas, moist forest is usually restricted to draws, which are usually moister, productive, and protected from wind and salt spray (Gray and Daniels 2006). Moist forest tree species include western red cedar (*Thuja plicata*), grand fir, western hemlock (*Tsuga heterophylla)*, and Douglas-fir.

The moist forests on Patos Island are considered of high ecological importance. The Western Red Cedar-Grand-Fir/Swordfern Forest association that occurs on Patos has been described as the best example of this closed forest type in Washington (Crawford and Chappell 2006).

As with dry forest, current moist forest conditions in the San Juan Islands differ from historic conditions, which were characterized by more open conditions and uneven-aged patches of forest (Gray and Daniels 2006). In addition, western hemlock, Sitka spruce, lodgepole pine, and grand fir, now a part of the moist forest species composition, may not have been present in the past (Gray and Daniels 2006).

Grassland and Shrubland

This sub-section addresses the Vancouverian Lowland Grassland and Shrubland macrogroup from Table 6. The Vancouverian Lowland Wet Shrubland, Wet Meadow, and Marsh macrogroup is discussed under wetlands, below. Vancouverian Lowland Grassland and Shrubland is made up of the North Pacific Herbaceous Bald and Bluff plant community, which is a dry to mesic (i.e., moderate moisture) grassland and shrubland (Kittel 2010). This section will refer to this community as grassland and shrubland.

The grassland and shrubland communities consist of mostly herbaceous-dominated areas (balds) located primarily on shallow rocky soils (NatureServe 2015). Due to shallow soils, steep slopes, sunny aspect, and/or upper slope position, these sites are dry and marginal for tree establishment and growth except in favorable microsites. The vegetation is grassland with some dwarf-shrubs, which can occur as small patches but are usually in a matrix with the herbaceous vegetation.

Rock outcrops are a typical small-scale feature within balds and are considered part of this system (Kittel 2010). Sites with many favorable microsites can have a "savanna" type structure with a sparse tree layer of Douglas-fir or, less commonly, Garry oak or other species. The southern extent of the Monument has a relatively dry climate, always with a distinct dry summer season when these sites usually become droughty enough to limit tree growth and establishment (NatureServe 2015).

The grasslands and shrublands in the San Juan Islands were once maintained by fires, both naturally occurring and, primarily, set by native Coast Salish peoples (Kittel 2010). The presence of fire on the landscape supported camas (*Camassia* spp.), an important food source for the Coast Salish inhabitants. Grasslands and shrublands have declined throughout the San Juan Islands and the broader ecoregion, primarily due to development and a decrease in fire frequency. Euro-American settlement brought livestock grazing and more intensive cultivation, reduced the frequency of fire, and resulted in the introduction of numerous non-native plants. This resulted in fewer native forbs, including camas.

Because of this change in the fire regime, the extent of grasslands and shrublands has declined locally through tree invasion and growth. Areas formerly maintained as herbaceous by burning have filled in with trees. There is currently no active management to prevent this encroachment.

Less than 3 percent of grasslands dominated by native species are extant, as measured using aerial photographs, soil surveys, ground-truthing, and previous mapping efforts (Chappell et al 2000). The North Pacific Herbaceous Bald and Bluff ecological system is considered vulnerable in the state and has a short-term 30-50 percent decline in trend predicted, with a corresponding long-term trend of a 10-30 percent decline (WNHP 2015).

Most of the grasslands and shrublands in the San Juan Islands, including within the Monument, are largely composed of non-native grasses, and support a mixture of native and non-native forbs. The presence or absence and relative dominance of groups such as non-native versus native grasses, forbs, and shrubs can be used to describe the habitat quality in grasslands and shrublands. Line-point data from herbaceous balds and bluff areas collected in 2014 indicate an average of 45 percent non-native cover (BLM 2014a). *Vulpia bromoides* was the most common non-native grass.

Threats to Monument grasslands and shrublands include changes in the fire regime, climate change, and invasive species competition. Additional threats include overgrazing by species include native black-tailed deer (*Odocoileus hemionus columbianus*) and non-native European rabbits (*Oryctolagus cuniculus*). Fragmentation caused by excessive social trailing is also a threat to the integrity of remaining grasslands. User created trails are noticeably present in the Monument grasslands and shrublands on the south end of Lopez Island. These systems tend to be very sensitive to disturbance and trampling.

In a study funded by the BLM and Washington Native Plant Society, Rhoades (2009) describes nearly 200 lichen species at Point Colville and Iceberg Point. Some of species are found in forested areas, while others grow on moss and rock in open areas and are vulnerable to foot traffic and weed encroachment. Rhoades found damage from foot travel of lichen heaths made up of fragile *Cladonia* species. This genus is especially vulnerable to breakage and can take decades to recolonize.

Nearshore Habitat and Nearshore Marine Plant Communities

Nearshore habitats include the littoral zone i.e., the area from the high water mark, which is rarely inundated, to shoreline areas that are permanently submerged. The BLM's jurisdiction, and the Monument designation, applies only above mean high tide. All Monument locations include shoreline and management can affect habitat below mean high tide, as well as the portions of the shoreline that lie above mean high tide.

The BLM's management of the Monument may affect nearshore habitats, including shoreline, high impact surf zones, kelp forest, and seagrass beds. There are six seagrass species in Washington State: *Zostera marina* (eelgrass), *Zostera japonica* (non-native), *Phyllospadix serrulatus, Phyllospadix scouleri, Phyllospadix torreyi,* and *Ruppia maritima*. Eelgrass is by far the most abundant seagrass species in the greater Puget Sound. Eelgrass provides similar ecosystem services as other seagrass species (Christiaen et al 2017). Shoreline habitat comprises both sandy/gravelly (unconsolidated) shoreline and rocky shoreline. The North Pacific Maritime Coastal Sand Dune and Strand ecological system is associated with sandy/gravelly shoreline and spits (NatureServe 2009).

Much of the shoreline within the Puget Sound has been modified (historically and recently) for agricultural, industrial, and residential uses. San Juan County has the lowest modification level in the Puget Sound region, with around 5 percent of its shorelines modified (Herrera 2011, Friends of the San Juans 2011). In addition to being less heavily developed than other parts of the Puget Sound region, many of the San Juan County shorelines are rocky, and so less vulnerable to erosion. Based on lack of disturbance and minimal shoreline stabilization, shorelines in (above mean high tide) and adjacent to (below mean high tide) the Monument action area are assumed to be in good condition.

Native eelgrass (*Zostera marina*) covers an estimated 9 percent of Puget Sound below the mean lower low water mark, and is found along roughly 20 percent of San Juan County shoreline (SSPS 2007). Eelgrass occurs as patches or narrow bands near the shore, or as solid meadows in the subtidal zone. Eelgrass and other seagrasses provide physical structure and trophic support for the biological community and is nursery habitat for many sensitive species including salmon (Murphy et al. 2000, Mumford 2007).

The condition (quality and extent) of seagrass beds can be reduced through introduction of toxicants, sediment delivery leading to mechanical abrasion, burying, turbidity (lack of light penetration), and mechanical loss during moorings (New South Wales Department of Primary Industry 2017). Seagrass conditions have remained stable or improved in the San Juan Islands generally, but eelgrass beds in bays such as Watmough Bay have seen substantial long-term declines (Christiaen et al. 2017). Seagrass beds are indicators of adequate water quality and absence of heavy disturbance or nuisance algae. Based on observed declines, the BLM assumes the quality of seagrass habitat in Watmough Bay is reduced from reference conditions (i.e., not high-quality), while seagrass communities in less enclosed inlets adjacent to the remainder of the Monument are in better condition. Sediment cycles in the Monument appear to be within historic ranges. No sediment plumes from Monument lands have been observed, and existing nearshore habitat does not show evidence of high sediment delivery such as silting-in of seagrass beds or forage fish spawning areas. However, water quality impacts from non-point source pollutants (roads, boats, etc.) appear to be high enough lead to seagrass bed declines in adjacent nearshore areas with less flushing (e.g., Watmough Bay).

Watmough Bay includes the single most important forage fish spawning habitat area adjacent to the Monument (Friends of the San Juans 2007). Since this habitat type requires primarily substrate and wave disturbance and is not reliant on water quality (or lack of physical disturbance), it is assumed that forage fish spawning habitat areas adjacent to the Monument retain relatively stable and high-quality condition.

Kelp forests in the San Juan Islands may include multiple species of algae, often dominated by bull kelp (*Nereocystis luetkeana*). Most kelp forests occur in the shallow subtidal zone from the mean lower low water mark to about 65 feet below this mark and are associated with high-energy environments (Mumford 2007). Floating kelp species occur along approximately 31 percent of San Juan County's shoreline, while non-floating kelps occur along 63 percent (Mumford 2007). Kelp forests provide refuge habitat for a number of fish species (Mumford 2007). Through food web interactions, kelp forests are an important community for sea urchins, herring, crabs, mollusks, and a variety of marine mammals including sea otters and whales (Steneck et al. 2002, Mumford 2007, NOAA 2010).

Kelp forests showed declines in recent state-wide surveys, including substantial declines in the Straits of Juan de Fuca (WDNR 2015c). Diverse factors influence kelp forest stability including kelp harvest, plant competition, storms, El Niño events, sedimentation, pollution, and grazing by fishes, sea urchins, and crustaceans (NOAA 2017). Non-point and point source pollution including sewage, industrial disposal, and runoff might contribute to this decline. High sedimentation from run-off may bury new plant shoots. Studies on microscopic stages of kelp suggest it is sensitive to poor water and sediment quality (NOAA 2017). Based on lack of point source pollution, limited non-point pollution, and mostly open marine systems, it is assumed that kelp forests adjacent to the Monument support moderately healthy conditions.

Threats facing the shorelines of San Juan Islands include climate change-induced sea level rise, geologic events, invasive species, human disturbance, contaminants, and marine debris. Impacts to nearshore habitats from current Monument management are limited to sediment deposition from trails, disturbance of nearshore vegetation from boat landing, and impacts to nearshore habitat function from shoreline stabilization. All shoreline stabilization within the Monument to date has been soft stabilization.

Wetlands

This sub-section addresses the condition of the Vancouverian Flooded and Swamp Forest and the Vancouverian Lowland Wet Shrubland, Wet Meadow, and Marsh macrogroups described in Table 6.

All freshwater wetlands within the Monument are found on Lopez Island. These wetlands have been described by Dunwiddie (2010) and Hedges and Camp (1996). The BLM has classified wetland conditions in the Monument using the proper functioning condition methodology (Prichard 1999). This qualitative classification (supported by quantitative measures and observations) includes three classes: proper functioning condition, functional-at risk, and nonfunctional. Systems in proper functioning condition have adequate vegetation, landform, and structure to dissipate energy, filter sediment, stabilize shorelines, and provide habitat for native riparian species. With the exception of the Point Colville wetland, all wetlands in the Monument are currently meeting proper functioning condition. The wetland at Point Colville is functional-at risk. To summarize, 40 acres of Monument wetlands are currently meeting proper functioning condition, 2 acres are functioning at risk, and 0 acres are nonfunctioning.

Wetland functional condition as defined in Prichard 1999 includes three attributes: hydrology, vegetation, and erosion/deposition. Wetland hydrology includes consistent saturation with water quality and flow pattern sufficient to produce wetland conditions. Vegetation attributes include presence, diversity, and function (including stabilizing functions) of wetland plants. Erosion/deposition attributes include soils or bedrock restricting percolation and promoting saturation, without excessive erosion or deposition.

The wetlands in the Monument currently have erosion/deposition patterns that promote stable wetlands, including basins that support saturated hydric soils with balanced erosion and deposition supporting stable banks. Vegetation attributes in most Monument wetlands include a diversity of stabilizing riparian-wetland plants, with few non-native species that are also non-stabilizing or non-hydrophytic species. Invasive reed canary grass, which is stabilizing and hydrophytic, is co-dominant in some Monument wetlands. The wetlands that are co-dominated by invasive reed canary grass have a limited ability to provide high-quality freshwater habitat, though they do currently meet proper functioning condition.

The Point Colville wetland is dominated by sedge (*Carex obnupta*) under a Sitka spruce (*Picea sitchensis*) overstory. This area has been called a bog, but does not meet bog definitions, as it is not overly acidic and does not support sphagnum moss. Comparisons with old aerial photos suggest that Point Colville wetland is filling in with trees (BLM 1990), primarily Sitka spruce, which is an upland species. This tree infilling has reduced cover by wetland plants and decreased presence of hydric soils, causing a decline in the wetland's function over time.

Effects of the Alternatives

Forest and Woodlands

The alternatives vary in how they would affect the structure and species composition of forests and woodlands and the condition of large and old trees. Specifically, they vary in the objectives and management direction that would drive vegetation treatments over the life of the plan and in the type and extent of recreational activities that would occur in existing forest and woodlands (Table 9). Figure 2 compares the estimated annual forest and woodland treatment acres under each alternative.

Vegetation treatments, which would vary by alternative in terms of both type and extent, would move the composition, structure, and function of forest vegetation toward each alternative's desired conditions. Effectiveness of treatments would vary among alternatives due to differences in acres likely to be treated and types of treatments. Untreated areas that are currently departed from the normal historic conditions would be less resilient to insect, disease, and fire due to high stand densities, altered species composition and structure, and existing disease and insect outbreaks, and high levels of fuel loading.

Camping in forests and woodlands can result in a reduction in understory cover and height at impacted sites (Cole and Monz 2003). Construction of new trails would result in removal of understory vegetation including, potentially, small trees. The effects of existing trails include the exposure of tree roots through

erosion and trampling of understory vegetation adjacent to the trail (Dale and Weaver 1974). Wilson and Seney (1994) and Marion (2006) found that equestrian use had the highest erosional and trail-widening impact on trails, followed by hiking, then mountain biking. Meadow and weedy plants are common at trailsides in forests, although, only a narrow (1-2 m) band of vegetation is affected. Plant responses at campgrounds and other high-use areas would be similar to those along trails (Dale and Weaver 1974).

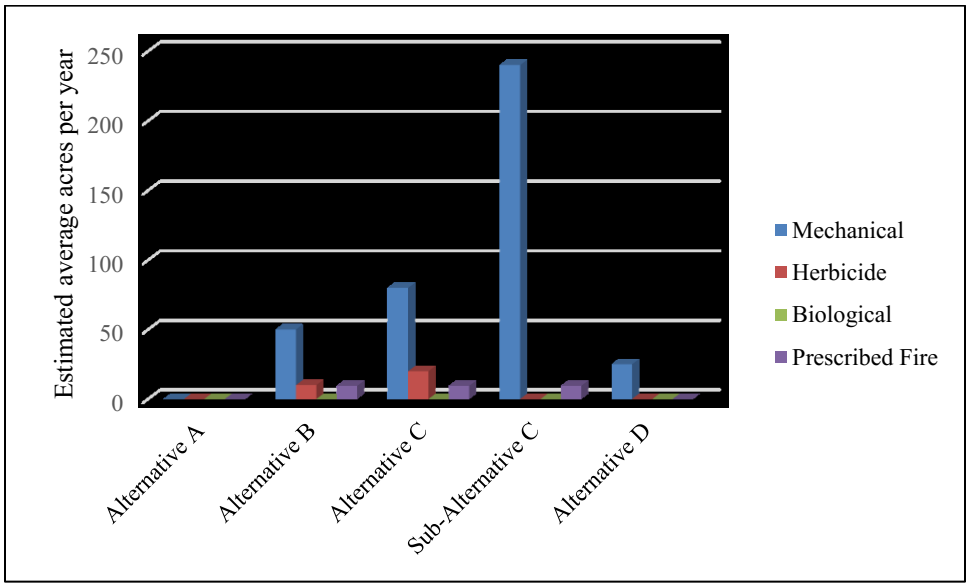


Figure 2: Estimated average acres of forest and woodland treatments per year

Table 9: Recreational activities in forest and woodlands by alternative

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Public motorized use (road miles)	0.9	0*	0.9	0.5*	0.9
Hiking (trail miles)	9.2	0	14	7.7	17.2
Equestrian (trail miles)	9.2†	0	0	2	6.7
Bicycling (trail miles)	9.2†	0	0	0	6.6
Dispersed camping (acres)	421	0	0	0	468
Dispersed camping w/permit (acres)	0	0	600	0	0
Designated site camping (acres)	13‡ (in existing sites)	0	13‡ (in existing sites)	13‡ (in existing sites)	342** (existing and new sites)

*The BLM would close all roads in forest and woodlands under Alternative A and 0.4 miles under Alternative C to public motorized use, but would maintain all existing roads for authorized and administrative purposes.

†Trails are currently open to all non-motorized uses. There is currently limited equestrian use at Chadwick Hill and Watmough Bay. There is no regular use of Monument trails by bicycles.

‡Forested portion of the developed west end of Patos Island; Patos Island has 7 existing sites.

**Specific site locations for new designated campsites would be determined during plan implementation phase and involve a separate planning and NEPA compliance process.

No Action Alterative

Plant Community Structure

Under the No Action Alternative, the BLM would continue to undertake very limited vegetation treatments in Monument land in the forest and woodland class. Over the next 20 years, the percent of

Monument forests with a closed canopy would exceed 90 percent, further diverging from the area's historic conditions. Less shade tolerant understory vegetation would decline under this alternative.

Under this alternative, there would continue to be at least 9.2 miles of trail in the Monument's forest and woodlands (see Table 9). If current recreation trends continue, the trail miles in more accessible forests and woodlands would expand. There would also continue to be 9 designated campsites at Patos Island, some of which occur in forested habitat. Understory vegetation would continue to be displaced and trampled in and around these campsites and trails. This impact would be limited to areas in and around campsites and trails, but could compound effects on less shade tolerant understory vegetation from increasing shading in these areas. Though visitors rarely participate in dispersed camping, the BLM would continue to allow this use on 421 acres of Monument land in the forest and woodland class.

Large and Old Trees

Under the No Action Alternative, it is likely that no vegetation treatments would occur in areas with large old trees over the next 20 years, with the exception of the occasional removal of hazard trees. These stands would remain overstocked, departed from historic conditions, and increasingly susceptible to insects, diseases, drought, climate change, and stand-replacing fires. See the affected environment section for further description of these conditions.

Any beneficial impacts from the removal of hazard trees would likely be minor and short-term. These treatments would target trees that are posing threats to human health or safety or historic structures within the Monument. Beneficial impacts would result from the opening of the forest canopy and increased availability of water and nutrients to other trees near the removed hazard trees, but would not alter species or structural diversity outside of their immediate surroundings.

Species Composition

Under the No Action Alternative, the trends in species composition described in the affected environment would continue. This alternative would provide the least benefits to shade intolerant and moderately intolerant species, including Garry oak, seaside juniper, aspen, and Pacific madrone. Shade tolerant species such as western hemlock, Sitka spruce, Douglas-fir[39], and grand fir would continue to expand, though increasingly dense conditions would make them susceptible to insects, diseases, drought, climate change, and stand-replacing fires. Several shade tolerant species may not have been present historically making their expansion an increasing departure from historic conditions (Gray and Daniels 2006).

Denser canopies would increase forest floor litter and humus, favoring less fire-adapted species. This addition of conifer litter would likely cause changes to soil properties, including nutrient cycling, microbial activity and moisture-holding capacity, which may influence the community of understory plants (Livingston et.al. 2016).

Visitor and staff use would continue to create opportunities for invasive plant establishment on 3 feet on each side of 10.1 miles of roads and trail in forests (Dale and Weaver 1974). Invasive establishment related to vegetation treatments would continue to be minimal.

Alternative A

Under Alternative A, the BLM's management of forests and woodlands would continue to be primarily passive. Because the BLM estimates that it would only undertake vegetation treatments for invasive plant species and hazard tree removal under this alternative (see Habitat and Plants Issue 3), the impacts to forests and woodlands would be similar to those from the No Action Alternative. The primary difference in effects to forests and woodlands would be from changes in recreation management.

[39] In wet draws where red cedar and hemlock are present, Douglas-fir is shade intolerant compared to the more shade tolerant cedar and hemlock; it is thus not found in the understory in such areas. In the drier portions of the Monument, Douglas-fir is found in the understory (Van Pelt, 2008) and behaves as a shade tolerant species.

Under Alternative A, the BLM would prohibit recreational use within the Monument, though it would continue to facilitate public access for authorized educational, scientific, cultural, and spiritual uses. Over time, trail mileage and clearings for campsites within forests and woodlands would decrease. Understory vegetation would recover from the effects of trampling in and around campsites and trails, though this recovery would take several years (Cole and Monz 2003).

Opportunities for invasive plant spread in forests would be reduced due to the decline in trail miles. Invasive establishment related to vegetation treatments would continue to be minimal.

Alternative B

Plant Community Structure

Under Alternative B, the BLM would increase the extent of acres of the grassland and shrubland vegetation class, which includes tree savanna, and of wetlands within the Monument by expanding them into areas currently occupied by forest and woodland. Within lands that would remain in the forest and woodland class, the BLM would undertake treatments to enhance late-successional characteristics and to promote resistance and resilience from fire, drought, insect pests, disease, and climate change.

In order to achieve objectives, the BLM estimates that it would use prescribed fire in existing woodland, such as at Kellett Bluff, and light thinning in much of the remaining forest and woodlands (See Habitat and Plants Issue 3). The BLM would use thinning in second growth forests to enhance late-successional characteristics by inducing fine-scale variation in homogeneous canopies (Aukema and Carey 2008). The use of thinning and fire would reduce the potential for stand replacement and crown fires (Peterson et. al. 2004). Treatments would have some short-term negative effects, including potential increase in invasive plant species and a temporary reduction in understory cover (Aukema and Carey 2008). Over the life of the plan, treatments would result in less dense forests and more open canopies than under the No Action Alternative and alternatives A and D, though conditions would not be as open as under Alternative C.

Under this alternative, trails crossing forest and woodland would increase to 14 miles (see Table 9). The nearly 5 miles of new trails in forest and woodland would require removal of understory vegetation, including small trees. There would also continue to be 9 designated campsites at Patos Island, some of which are in forested habitat. Designated site camping with a permit would be allowed on 600 acres that are currently in the forest and woodland class. These acres and miles would decline over the life of the plan as currently forested acres are converted to grassland and shrubland (see Habitat and Plants Issue 1). Understory vegetation would be displaced and trampled in and immediately around campsites and trails.

The structure of the forest under this alternative would be closer to historic conditions and would be more resistant and resilient to effect from fire, disease, and other potential disturbances.

Large and Old Trees

Under Alternative B, the BLM would undertake treatments to remove younger trees that are creating overstocking stress on large and old trees that were established during more open conditions. In the long-term, large and old trees would recover physiologically and become more resilient and resistant to threats including high intensity wildfire, insect and disease attack, drought, and climate change.

Species Composition

Under Alternative B, treatments would reduce competition and increase sunlight reaching shade intolerant and moderately intolerant species, including Garry oak, seaside juniper, aspen, and Pacific madrone. Shade tolerant species such as western hemlock, Sitka spruce, Douglas-fir[40], and grand fir would continue to exist in the Monument, though would not continue to expand. Several of these shade tolerant species may not have been present historically (Gray and Daniels 2006).

[40]In the Monument's wet draws where red cedar and hemlock is present, Douglas-fir is intolerant of shade compared to the more shade tolerant cedar and hemlock; it is thus not found in the understory in such areas. In the drier portions of the Monument, Douglas-fir is found in the understory (Van Pelt, 2008) and behaves as a tolerant species.

Thinning in oak woodland, such as at Kellett Bluff, would allow oaks to recover their natural open growing crowns, potentially converting some areas to oak savanna. This would benefit the long-term sustainability of oak populations since most acorns are produced in the sunlit portions of the crown (Peter and Harrington, 2005). It would also decrease competition for water from encroaching conifers (Gould et.al. 2011). Treatments would increase resistance and resilience of Garry oaks suppressed by over-story shading and open up more former habitat for oak repopulation.
The BLM would thin understories where they are currently dominated by a single species (e.g., rhododendron dominate the understory of forest on Patos Island), allowing for more diverse understories.

Visitor and staff use would create opportunities for invasive plant establishment on 3 feet on each side of 14.9 miles of roads and trail in forests (Dale and Weaver 1974). Opportunities for invasive plant establishment due to disturbance from vegetation treatments would increase substantially compared to the No Action Alternative; the BLM would minimize this impact through treating areas to control invasive plants, including with herbicides.

Alternative C

Plant Community Structure

Under Alternative C, the BLM would approximate historic conditions by increasing acres in grassland and shrubland, which includes tree savanna, by expanding this class into areas currently occupied by forests and woodlands. In Monument lands that would remain forest and woodland, the BLM would undertake treatments to approximate the more open conditions that would have historically occurred through the use of fire as a management tool by Native American/Indigenous Peoples (Anonymous 1868, Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011).

The BLM estimates that it would undertake similar treatments under Alternative C as under Alternative B, though these treatments would be repeated more times over the life of the plan. Due to the higher repetition rate, short-term negative effects would be greater than Alternative B. Over the life of the plan, treatments would result in the least dense forest conditions and most open canopies of any alternative.

Under this alternative, trails in forest and woodlands would decrease to 7.7 miles (see Table 9). The miles of trail would further decline over the life of the plan as currently forested acres are converted to grassland and shrubland (see Habitat and Plants Issue 1). There would continue to be 9 designated campsites at Patos Island, some of which are in forested habitat. Understory vegetation would be displaced and trampled in and immediately around campsites and trails. Where trails were closed, understory vegetation would recover from the effects of trampling over the course of several years (Cole and Monz 2003). There would be no dispersed camping allowed under this alternative.

Large and Old Trees and Species Composition

Effects to large and old trees and in forest and woodland species composition would be similar under alternatives B and C except that there would be fewer opportunities for invasive plant spread from roads and trails under Alternative C. Visitor and staff use would create opportunities for invasive plant establishment on 3 feet on each side of 8.2 miles of roads and trail in forests (Dale and Weaver 1974). Opportunities for invasive plant establishment due to disturbance from vegetation treatments would be slightly greater under Alternative C than Alternative B due to the higher treatment repetition.

Sub-Alternative C

With two exceptions, impacts to forests and woodlands under Sub-Alternative C would be the same as under Alternative C.

Without herbicide use, treatment of areas where the forest understory is dominated by a single species would be less effective. Without the use of herbicides to suppress currently dominating species (e.g., rhododendron in Patos Island forests), few other types of vegetation could become established. The prohibition on herbicide use would also make it more difficult for the BLM to minimize invasive plant species in areas disturbed through vegetation treatments and along trail and road sides.

The higher rate of treatment repetition that would be required to achieve objectives without the use of herbicides (see Habitat and Plants Issue 3) would create greater short-term negative effects to forest species composition and structure than under Alternative C.

Alternative D

Plant Community Structure

Under the objectives for Alternative D, the BLM would maintain approximately the current forest and woodland conditions existing within the Monument.

Under this alternative, trails in forest and woodlands would increase to 17.2 miles (see Table 9). The 8 miles of new trails in forest and woodland would require removal of understory vegetation, including small trees. The BLM would also allow designated site camping at new and existing sites on 342 acres in forest and woodland, including at Iceberg Point, the east side of Patos Island, Point Colville, and Turn Point. Specific locations for new campsites would be determined during plan implementation and would involve a separate planning and NEPA compliance process prior to on-the-ground disturbance. Dispersed camping would be allowed on an additional 468 acres in the forest and woodlands class. Understory vegetation would be displaced and trampled in and immediately around campsites and trails.

Large and Old Trees

Under Alternative D, the BLM would undertake treatments in areas with large and old trees only to prevent an increase in overstocking compared to current conditions. Treatments to prevent further crowding would provide some long-term benefits to forest and woodlands compared to the No Action Alternative. Large and old trees would continue to be under competitive stress from smaller, younger trees, but these conditions would not increase over the life of the plan.

Species Composition

Under Alternative D, shade intolerant and moderately intolerant species, such as Garry oak, seaside juniper, aspen, and Pacific madrone, would continue to be under-represented in the Monument's forests and woodlands compared to historic conditions. Populations of shade tolerant species such as western hemlock, Sitka spruce, Douglas-fir, and grand fir would continue to be over-represented. Several of these species may not have been present historically (Gray and Daniels 2006).

Visitor and staff use would create opportunities for invasive plant establishment on 3 feet on each side of 18.1 miles of roads and trail in forests (Dale and Weaver 1974). Opportunities for invasive plant establishment due to disturbance from vegetation treatments would increase slightly compared to the No Action Alternative; the BLM would minimize the ability for such species to capitalize on these opportunities through treating areas to control invasive plants, including with herbicides.

Conclusion

Table 10 qualitatively summarizes the effects of the alternatives on the condition of forests and woodlands. It describes each alternative as causing an improvement, decline, or no change (+,-,=) in various components of forest and woodland conditions.

Under the No Action Alternative and Alternative A, closed forests would continue to make up approximately 89 percent of Monument forest and woodland, with over 50 percent in mid aged closed forests that mostly developed after Euro-American settlement. These alternatives would result in a continued decline of open forest conditions and a continued increase in closed forests due to infilling of forested vegetation. Shade intolerant species would be negatively impacted from continued and increasing shading from taller coniferous species. Shade tolerant species would continue to increase. Large and old trees would come under increasing stress from the denser vegetation. Forest stands under these alternatives would continue to be less resistant and resilient to both natural and human disturbances.

Under alternatives B and C, management actions would treat forests to create more open conditions. These treatments would be more intensive under Alternative C to approximate the more open conditions

that would have existed prior to Euro-American settlement. In addition, the BLM would convert 51 percent and 47 percent of Monument forest acres to grasslands and shrublands under alternatives B and C respectively. Most of the treated and converted stands would originate from the class B (mid-aged, closed stands). Shade tolerant species would decline in extent, while shade intolerant species would increase in extent and improve in resistance and resilience to disturbances. Implementation of treatments to reduce competition stress would benefit large and old trees.

Under Alternative D, the BLM would seek to maintain the forested vegetation in its current extent and condition. Open forest would continue to be only a small portion of the Monument (approximately 12 percent). Shade tolerant species would continue to thrive and shade intolerant species would continue to decline. The BLM would maintain large and old trees through vegetation treatments. Resistance and resilience to disturbance would not improve and would remain low due to vegetation competition stress that a large portion of the forested area is experiencing in its present state.

Table 10: Summary of the effects of the alternatives on forest and woodland conditions

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Open Forest	-	-	+	+	=
Closed Forest	+	+	-	-	=
Shade tolerant species	-	-	+	+	=
Shade intolerant species	+	+	-	-	-
Large and old trees	-	-	+	+	=
Resistance/resilience to disturbance	-	-	+	+	-

Cumulative Effects of the Alternatives on Forests and Woodlands in the San Juan Islands

The majority of forest vegetation within the San Juan Islands is managed by private land owners, the National Park Service, and the State of Washington. The Monument includes less than 2 percent of the Southern Vancouverian Dry Foothill Forest and *Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens* forest macrogroups that occur in the San Juan Islands.

While a variety of past management actions have affected forest and woodland habitat in the San Juan Islands, the primary agents driving current conditions were the end of fire as a management tool on the landscape and timber harvest after Euro-American settlement. These actions have altered the historic condition, extent, and distribution of forest and woodland habitat in the San Juan Islands.

Other than hazard tree removal, there is currently limited active management of forest and woodland on public lands in the San Juan Islands. One exception is vegetation management the San Juan County Land Bank is undertaking to restore Garry oak woodland and savanna on approximately 25 acres on Orcas and San Juan islands (Habbeger 2017). There also remains some small-scale timber harvest occurring on private lands, including management intended to reduce the density of the forest canopy and enhance oak woodlands (Northwest Natural Resources Group 2017, Rainshadow Consulting 2017).

Under all alternatives, the Monument would continue to contribute only a small percent of forest and woodland communities in the San Juan Islands. Under the No Action Alternative and alternatives A and D, it would continue to contribute less than 2 percent of the Southern Vancouverian Dry Foothill Forest and *Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens* forest macrogroups in the San Juan Islands. Under these alternatives, it is likely Monument forests would return to something resembling historic conditions only through insect infestations, disease, and/or uncharacteristic stand-replacing fires. This could create risks for forests and woodlands on public and private lands adjacent to the Monument.

Under alternatives B and C, the BLM would reduce the acreage of forest habitat within the Monument would by approximately 50 percent. This would result in a decrease of less than 1 percent of the Southern Vancouverian Dry Foothill Forest and *Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens* forest macrogroup acres in the San Juan Islands. Under alternatives B and C, the BLM would enhance woodland habitats and open forest conditions, which are declining in the San Juan Islands. These alternatives would have a beneficial impact on conditions of forests in the San Juan Islands in general, as it would reduce risks to adjacent plant communities and increase the relatively small extent of forests and woodlands in near historic conditions.

Grasslands and Shrublands

The alternatives vary in several ways that would affect Monument grassland and shrubland. Specifically, they vary in the objectives and management direction that would drive vegetation treatments and in the type and extent of recreational activities that would occur in grasslands and shrublands (Table 11). Figure 3 compares the estimated annual grassland and shrubland treatment acres under each alternative.

This sub-section also addresses herbaceous balds and bluffs (here rocky balds and bluffs) including exposed rocky areas with moss and lichen cover. Since rocky balds and bluffs often occur on the viewing edge of Monument locations, visitors are tempted to leave trails or are unable to discern trails and wander over the rocks. This has both short and long-term negative impacts and vegetation is slow to recover.

See Habitat and Plants Issue 4 for impacts to specific special status plants.

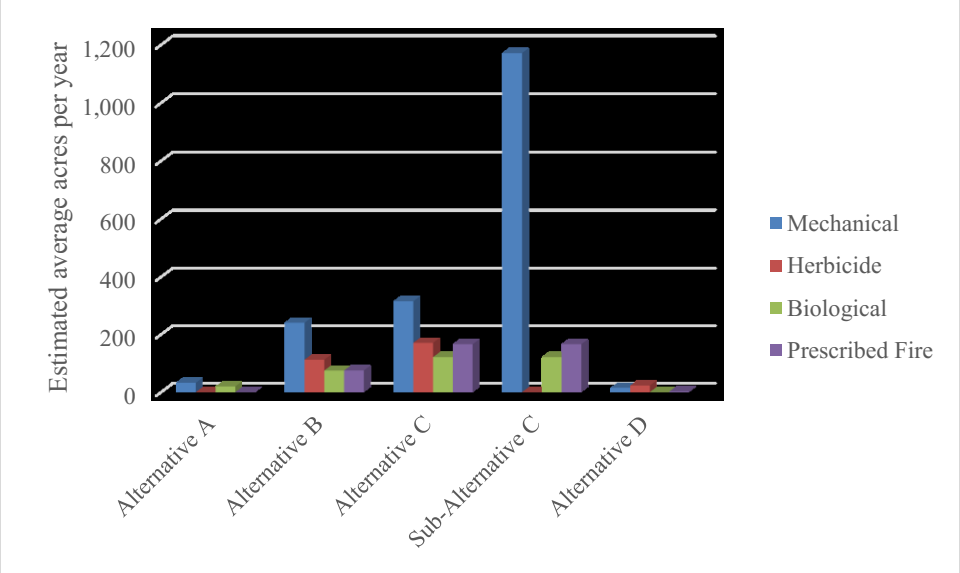


Figure 3: Estimated average treatment acres in grassland and shrubland per year

Table 11: Recreational activities in grassland and shrubland by alternative

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Public motorized use (road miles)	0	0	0	0	0
Hiking (trail miles)	5.1	0	4.4	2.9	5.6
Equestrian (trail miles)	5.1*	0	0	<0.1	1
Bicycling (trail miles)	5.1*	0	0	0	1.1
Dispersed camping (acres)	66	0	0	0	25
Dispersed camping w/ permit (acres)	0	0	87	0	0

Designated site camping (acres)	8 (in existing sites)	0	8 (in existing sites)	8 (in existing sites)	93† (existing and new sites)

* Trails are currently open to all non-motorized uses. There is currently limited equestrian use at Chadwick Hill and Watmough Bay. There is no regular use of Monument trails by bicycles.
† Specific locations for new designated campsites would be determined during plan implementation and involve a separate planning and NEPA compliance process prior to any on-the-ground disturbance.

No Action Alternative

Under the No Action Alternative, native forest species, along with native and introduced shrubs and forbs, would continue to encroach on Monument grasslands and shrublands. Vegetation treatments in grasslands and shrublands would continue to be minimal and limited to small-scale mechanical removal (predominately clipping above ground growth) of invasive plants. Therefore, the number of plant groups (i.e., native bunchgrasses or flowering forbs), species within those groups, and the cover of those species would stay the same or continue to decline slightly as non-native species continue to spread. The current rate of decline is not known, but over the long-term there would be a neutral to minor negative effect. Short-term negative effects from limited vegetation treatments would be negligible.

Under this alternative, there would continue to be at least 5.1 miles of trail crossing grasslands and shrublands (see Table 11). Trails would continue to be open to all non-motorized uses, though visitors currently use them almost exclusively for hiking. If current trends continue, trail miles in more accessible grasslands and shrublands, such as at Iceberg Point and Cattle Point, would increase over time.

Use of these trails would continue to have direct negative short-term and long-term impacts on grasslands and shrubland plant associations through soil compaction, erosion via channeling of water, and widening of trails during wet periods. Wilson and Seney (1994) and Marion (2006) found that equestrian use had the highest erosional and trail-widening impact on trails, followed by hiking, then mountain biking. All of these impacts may limit or decrease the number of native plants able to inhabit areas adjacent to the trails and favor non-natives that are adapted to harsher conditions such as compacted soil.

Camping in existing designated sites at Blind, Patos, and Posey islands would continue. These areas include approximately 8 acres of grassland and shrubland. Since these areas have already felt the impacts of camping, future effects would be negligible to grassland and shrubland quality. Dispersed camping would continue to be allowed in 66 acres of grassland, including at Cattle Point, Kellett Bluff, Turn Point, McConnell Rocks, and Lummi Rocks. If current recreation patterns continue, participation in this activity would remain relatively low. Effects of dispersed camping include negative short-term impacts such as crushing of vegetation from tents and hiking, which would result in damage and in some cases mortality.

Rocky Balds and Bluffs

Under the No Action Alternative, current impacts from recreational use in the rockiest areas of the herbaceous balds and bluffs would continue, including crushing and killing of lichens and mosses from off-trail travel over rocks. Visitors would continue to access these areas via the 5.1 miles of trail in grasslands and shrublands, as well as through overland hiking, which would continue to be allowed.

Vegetation treatments in the rocky portions of the herbaceous balds and bluffs would continue to be minimal and limited to cutting invasive plants. Due to the minimal extent of these treatments, they would be unlikely to affect the diversity and cover of native plants. They may have short-term negative effects from crushing native plants when occurring off trails. Effects from this to the moss and lichen on the rocks would continue to be minimal. Shallow rooted non-native grasses growing between rocks and in rock crevices would continue to compete with native vegetation. This negative impact would continue due to the limited extent of invasive plant treatments to control non-native grasses.

Alternative A

Under Alternative A, the BLM's management of grasslands and shrublands would be primarily passive. Encroachment by native forest species into Monument grasslands and shrublands would continue. Line-point data from herbaceous balds and bluff areas indicate an average of 45 percent non-native cover (BLM 2014a). This suggests that early in the life of the plan Monument grasslands and shrublands would cross the Alternative A threshold for invasive plant management: "Control and contain invasive plant species when an average of less than 50 percent cover by native vegetation remains in a vegetative community across the Monument." Control of noxious weed species designated by Washington State for mandatory eradication or control would continue to occur throughout the life of the plan.

Due to Alternative A's narrow vegetation objectives and prohibition on chemical treatments (e.g., herbicides) and prescribed fire, it is unlikely that the condition of the native plant community would greatly improve. Once grasslands and shrublands passed the invasive plant management threshold, the BLM would undertake invasive plant treatments (see Habitat and Plants Issue 3). Some seeding of native species would occur in conjunction with these treatments. Without the use of herbicides, treatment areas would not achieve high-quality standards (Denehey et al 2011, Stanley et al 2011a and 2011b, see assumptions in Appendix B). Clark and Wilson (2001) found that the number of inflorescences (flower heads) of velvetgrass (*Holcus lanatus*) and sweet vernalgrass (*Anthoxanthum odoratum*), both non-natives found in Monument grasslands, increased with hand removal and mowing. Competition with non-native plants would continue to cause short-term and long-term negative impacts to the diversity and cover of native plants. Short-term impacts due to the potential soil disturbance of manual treatments would be minor and negative.

The BLM would not anticipate restoring native plant communities under this alternative except through seeding and planting after invasive plant species treatments. This would result in the diversity and cover of native plants continuing to decline, despite removal of non-native plants. The overall effect to grassland and shrubland plant associations from this alternative would be negative in the long-term.

This alternative would close the Monument to recreational use, though the BLM would continue to facilitate access for authorized educational, scientific, cultural, and spiritual uses. The current negative impacts from recreation described under the No Action Alternative would not continue, though minor impacts from access for administrative and authorized uses would. Short-term negative impacts of trail use would be minimized under this alternative. The lack of herbicides under this alternative may make it difficult to entirely stop the spread of non-native plants along trails that are no longer in use.

In summary, the condition of grasslands and shrublands would likely decline over time as a result of invasive plant treatment being undertaken in the absence of both herbicides and broader treatments to restore native plants. Direct impacts from trampling and crushing due to recreational use would heal over time, though closed trails could be invaded by invasive plant species.

Rocky Balds and Bluffs

Under Alternative A, the BLM would be unlikely to treat non-native plants that are not invasive, such as the shallow rooted non-native grasses that are currently in some rocky balds and bluffs. The probable targets (e.g., Canada thistle) for those treatments that would take place are typically found in the deeper soils of grasslands and forests. Therefore, it is unlikely that damage to vegetation, including moss and lichen, would occur from mechanical treatment in this alternative. However, non-native plants would continue to compete with in the rocky balds and bluffs. This would be a negative long-term impact.

The closure to recreational uses have minor short-term positive impacts to rocky balds and bluffs. Moss and lichen on closed trails and at viewpoints would slowly recover, though would face competition from non-natives (see above). Major positive impacts would be long-term, as it would take years or decades for moss and lichens to regrow in places where they have been removed due to recreational use.

Alternative B

Under Alternative B, the BLM—likely working with tribes and other partners—would undertake extensive grasslands and shrubland restoration (see Habitat and Plants Issue 3 for estimated treatment types and acres). Treatments undertaken to maximize species richness, structural component diversity, and system resilience from fire, drought, insect pests, disease, and climate change, would have a major positive long-term effect on diversity and cover of native plants, though short-term negative effects would also occur. As described in the objectives for this alternative, treatments would be designed to maximize the species richness and structural diversity of native forbs, though not necessarily to eradicate shrubs.

Like alternatives C and D, all tools would be considered in designing implementation-level vegetation treatments. Treatments would have some short-term negative effects on native plants in grasslands and shrublands, but also major positive short-term and long-term effects on the condition of these communities by giving managers a variety of tools for effective habitat improvement (Stanley 2011). Soil erosion would increase in the short-term after vegetation removal. Early seral native species may fare better in the short-term after vegetation treatments, but may slowly be replaced by late seral species.

Under this alternative, the BLM would likely undertake prescribed burning to begin to reverse the effects of a lack of fire on the landscape and allow fire-tolerant species to increase in number and cover, while decreasing the cover of fire-intolerant species. Because fire-tolerant species include both native and non-native plants (Stanley 2011), the BLM would likely undertake carefully timed herbicide use shortly post-fire to target non-native plants while minimizing effects on slower germinating natives (Dennehy 2011).

Mechanical and herbicide treatments to remove woody shrubs (e.g., rose and snowberry) and encroaching trees would allow for increased cover of desired grassland species, such as camas and native grasses. The long-term impacts of such treatments would be positive. In the short-term, there would be negative impacts from ground disturbance from mechanical removal, including a temporary increase in invasive plants. Dunwiddie (2002) found that out-planting of native seedlings was needed to outcompete non-native species that established after tree and shrub removal on Yellow Island. Without aggressive native plant restoration, the negative impacts from invasive plants could be long-term.

Efforts to restore native plants would improve diversity by increasing the number of growth form groups and members of each group. Species richness would increase and have a positive long-term effect on the condition of grassland and shrubland communities. Short-term effects from soil disturbance due to plug planting and raking in seed, if used, would be minor and negative due to the possibility of opening soil to invasion on non-desirable species. The BLM would minimize this effect by seeding native species in conjunction with invasive plant treatments.

Herbicide application would result in some mortality of non-target plants, but this effect would be highly localized due to hand application methods (given the small size of Monument sites it is very unlikely that the BLM would undertake aerial herbicide application). This would be a short-term negative effect on group diversity and cover. Effects could further be minimized by the use of selective herbicides and careful phenological timing (Stanley 2011).

While trail miles would increase overall under Alternative B, there would be a net decrease of trails in grasslands and shrublands from 5.1 miles to 4.4 miles (see Table 11). This would include closure of trails at Cattle Point (0.2 miles) and Iceberg Point (0.6 miles), in addition to several smaller closures of less than 0.1 miles (see Appendix H for travel and transportation planning maps). Trail closures would have short-term minor negative effects from potential invasion of non-native plants on the former trail, as well as short-term positive effects because soil compaction, erosion via channeling of water, and widening of trails during wet periods would no longer occur. There would also be long-term positive effects due to treatments to restore native plants and control invasive species. By removing trails, restoration efforts may be easier to implement because additional recreational disturbance and spread of weed propagules would cease to exist in these areas. The BLM would prohibit cross-country hiking under this alternative.

Under Alternative B, camping would continue in existing designated sites and effects would be the same as the No Action Alternative. In addition, dispersed camping by permit would be allowed in 87 acres of grasslands and shrublands (see Table 11), including 50 acres that are not currently open to dispersed camping at Iceberg Point and Point Colville. Visitors would have to obtain permits for dispersed camping and the BLM would issue no more than one permit per location per night. Effects of dispersed camping include negative short-term impacts such as crushing of vegetation from tents and hiking, which would result in damage and in some cases mortality. Dispersed camping would also have a minor negative long-term effect to areas that are highly desirable camping locations due to level surfaces and favorable views.

In summary, the number and diversity of plant groups within the Monument's grasslands and shrublands would likely improve over the life of the plan. Impacts from trail use would decline due to the reduction of trail miles in grasslands and shrublands and the prohibition on cross-country hiking. Management of dispersed camping with a permit in easily accessible locations on Lopez Island would likely lead to a decline in grassland and shrubland condition in desirable camping locations over time.

Rocky Balds and Bluffs

Short-term negative impacts from treatments would primarily occur in grasslands—where the majority of target plant species occur—rather than on rocky balds and bluffs. Prescribed fire would be unlikely to reach into rocky areas, and would not be recommended for such areas because moss and lichen are killed by fire. Seeding of native species would occur in conjunction with invasive plant treatments.

As described above, trail miles in grasslands and shrublands would decline slightly under Alternative B, leading to a slight decline in associated impacts to rocky balds and bluffs. While no off-trail hiking would be allowed under Alternative B, some impacts from off-trail travel would likely continue given that these areas often provide views and visitors are tempted to leave trails or unable to discern trails over the rocks. Travel over rocks can cause negative short and long-term impacts such as crushing and killing of lichens and mosses, as well as of plants that might be rooted in cracks and crevices.

Impacts from dispersed camping with a permit on rocky balds and bluffs would be similar to those in grasslands and shrublands in general. The views from rocky balds and bluffs would attract campers, though their rocky nature would make them potentially less desirable as camping locations.

Alternative C

Under Alternative C, the BLM—likely working with tribes and other partners—would undertake extensive grasslands and shrubland restoration (see Habitat and Plants Issue 3 for estimated treatment types and acres). Vegetation treatments undertaken to achieve Alternative C's objective to approximate historic conditions would have a major positive long-term effect on diversity and cover of native species, though some short-term negative impacts would occur. Treatments would include intensive restoration efforts to remove non-native plants and restore native plants, including culturally important species.

Like alternatives B and D, all tools would be considered in designing implementation-level vegetation treatments. Impacts from vegetation treatments under Alternative C would be similar to Alternative B, though the magnitude of both short-term negative and long-term positive would be greater. Greater acres of treatment would be required to remove non-native plants and woody shrubs to an extent that would approximate historic conditions.

Under Alternative C, trail miles in grasslands and shrublands would decrease from 5.1 miles to 2.9 miles (see Table 11). This would include closure of trails at Cattle Point (0.5 miles) and Iceberg Point (0.9 miles), in addition to smaller closures at Blind Island, Indian Island, Patos Islands, and Point Colville (see Appendix H for travel and transportation planning maps). Trail closures would have short-term minor negative effects from potential non-native plant invasion on the former trail, as well as short-term positive effects because soil compaction, erosion via channeling of water, and widening of trails during wet periods would no longer occur. There would also be long-term positive effects due to treatments to restore native plants and control invasive species. By removing trails, restoration efforts may be easier to

implement because additional recreational disturbance and spread of weed propagules would cease to exist in these areas. The BLM would prohibit cross-country hiking under this alternative.

Under Alternative C, camping would continue in existing designated sites and effects would be the same as the No Action Alternative. Dispersed camping would no longer be allowed in 66 acres of grassland and shrubland currently open to this use. This use occurs only occasionally within these areas, so positive effects from closing to this use would be minimal, though would prevent any future crushing of vegetation from tents and visitor use associated with camping.

In summary, Alternative C's combination of intensive restoration treatments and substantial trail closures would lead to the greatest improvement of native grassland and shrubland cover and diversity over the life of the plan.

Rocky Balds and Bluffs

Alternative C's objective to approximate historic conditions would drive the greatest amount of change to vegetative on rocky balds and bluffs. Implementation-level treatments would likely be designed to remove non-native shallow rooted plants in the crevices and interspaces between rocks. The potential use of herbicides to undertake this task would cause short-term impacts to non-target species, including desirable natives such as moss and lichen. Correct plant identification and careful herbicide application would minimize this effect. The removal of non-native plants from rocky balds and bluffs would benefit native plants by reducing completion. Subsequent restoration of native species would result in higher cover of native plants and more species that would have been historically present.

As described above, trail miles in grasslands and shrublands would decline under Alternative C, leading to a decline in associated impacts to rocky balds and bluffs. While no off-trail hiking would be allowed under Alternative C, some impacts from off-trail travel would likely continue given that these areas often provide views and visitors are tempted to leave trails or unable to discern trails over the rocks. Travel over rocks can cause negative short and long-term impacts such as crushing and killing of lichens and mosses, as well as of plants that might be rooted in cracks and crevices.

Sub-Alternative C

Impacts from to grasslands and shrublands from recreation under Sub-Alternative C would be the same as those for Alternative C.

Under Sub-Alternative C, the BLM—likely working with tribes and other partners—would work to achieve the objectives of Alternative C without the use of chemical treatments (e.g., herbicides). To achieve the objectives without herbicides, the BLM would undertake a high frequency of vegetation treatments to remove invasive plant species and encroaching shrubs and trees (see Habitat and Plants Issue 3 for estimated treatment types and acres). Without the use of herbicides, treatment areas would be unlikely to achieve high-quality standards (Denehey et al 2011, Stanley et al 2011a and 2011b, see assumptions in Appendix B). Clark and Wilson (2001) found that the number of inflorescences (flower heads) of velvetgrass (*Holcus lanatus*) and sweet vernalgrass (*Anthoxanthum odoratum*), both non-natives found in Monument grasslands, increased with hand removal and mowing.

The BLM would use prescribed fire and repeated mechanical treatments to improve the cover and diversity of native plants by removing non-native plants and encroaching shrubs and trees, followed by native plant restoration. However, without combining prescribed fire with the use of herbicides, control of non-natives may not be possible (Stanley 2011) and the BLM may not be able to achieve the objective of approximating historical diversity and cover conditions. This could be mitigated somewhat through aggressive mechanical/manual treatments carefully timed to target non-natives. There would likely continue to be short-term and long-term negative impacts to the diversity and cover of native plants due to competition with non-natives. Seeding of native species would occur in conjunction with invasive plant treatments to fill in areas where invasive plants are removed.

The high frequency of mechanical treatments under this alternative would result in a higher level of short-term negative effects than would occur under Alternative C. This would lead to higher ground disturbance due to reentry, which could have a negative impact on the condition of the community.

In summary, under Sub-Alternative C, vegetation treatments would increase the diversity and cover of native plants, but would be unlikely to achieve the objective of approximating historical conditions.

Rocky Balds and Bluffs

In the absence of herbicides, the BLM would likely undertake the removal of invasive plants from rocky balds and bluffs through hand-pulling and digging. Short-term negative effects would include a greater level of soil disturbance than in Alternative C. Increased levels of seeding and planting of native plants would be necessary to prevent more invasive plants from colonizing the disturbed areas. The removal of non-native plants from rocky balds and bluffs would benefit native plants by reducing completion. Subsequent restoration of native species would result in higher cover of native plants and more species that would have been historically present.

Alternative D

Under Alternative D, the BLM's would be to maintain grassland and shrublands in approximately their current conditions (see Habitat and Plants Issue 3 for estimated treatment types and acres). To meet this objective, the BLM would undertake treatments to control invasive plant species, restore native plant species subsequent to treatments, and remove additional encroaching shrubs and trees.

Like alternatives B and C, the BLM would consider all tools in designing implementation-level vegetation treatments. Treatments would have some short-term negative effects on native species cover in grasslands and shrublands, but also minor positive short-term and long-term effects on the condition of these communities by giving managers a variety of tools for effective habitat improvement (Stanley 2011). Negative effects could be minimized by the use of selective herbicides and careful phenological timing (Stanley 2011). Over time, treatments to retain current conditions would have a positive impact on native plant groups compared to the No Action Alternative as well as to Alternative A, though the long-term impacts would be less beneficial than under alternatives B and C. Grasslands and shrublands would remain substantially invaded by non-native plants and encroaching trees and shrubs.

While Monument trail miles would increase substantially overall under Alternative D, in grasslands and shrublands there would be a relatively modest net increase from 5.1 to 5.6 trail miles (Table 11). This would include development of new trails in grasslands and shrublands at Blind Island (0.1 miles), Cattle Point (0.2 miles) Iceberg Point (0.2 miles), Kellett Bluff (0.1 miles), in addition to several new trail segments of less than 0.1 miles (see Appendix H for travel and transportation planning maps). Where the BLM developed new trails in grasslands and shrublands, habitat would be lost and adjacent habitat quality would decline. The new trail at the north end of Iceberg Point and the trail Kellett Bluff (which is part of a larger trail that goes mostly through forest and woodland) would be in herbaceous areas that do not have any current trails. These would result in mean loss and fragmentation of that habitat and would have short-term and long-term negative effects on this habitat.

Trail closures would also occur in grasslands and shrublands at Cattle Point (0.4 miles). Trail closures would have short-term minor negative effects from potential invasion of non-native plants on the former trail, as well as short-term positive effects because soil compaction, erosion via channeling of water, and widening of trails during wet periods would no longer occur. There would also be long-term positive effects due to treatments to restore native plants and control invasive species in trail closure areas.

All trails within grasslands and shrublands would be open to hiking. The BLM would continue to allow equestrian and bicycle use on respectively 1 mile and 1.1 miles of trail though grasslands and shrublands at Point Colville and Iceberg Point. These uses would be prohibited during the wet season. Impacts from equestrian use during the dry season would be similar to impacts from hiking, while use from bicycles would result in slightly less erosion to trails than either hiking or equestrian use due to the narrower

impact on the trail (Wilson and Seney 1994). Other researchers have found that equestrian use has much higher impacts to soil erosion and trail width than hikers and bicycles (Marion 2006).

Under Alternative D, the BLM would also expand designated site camping for visitors arriving by non-motorized boat to 93 acres of grassland and shrubland, including at Cattle Point and Iceberg Point. Specific locations for new designated campsites would be determined during plan implementation and would involve a separate planning and NEPA compliance process prior to any on-the-ground disturbance. Effects from designated site camping in existing sites would be the same as the No Action Alternative. Effects from new designated site camping would be trampling and crushing vegetation in and around campsites. This would result in direct mortality of individuals in concentrated areas. Additionally, social trails between campsites would be likely unless campsites are set up with an existing trail network.

In addition, dispersed camping by permit would occur in 25 acres of the Monument's grasslands and shrublands (Table 11), including at Kellett Bluff and Point Colville. Effects of dispersed camping include negative short-term impacts such as crushing of vegetation from tents and visitor use associated with camping, which would result in damage and in some cases mortality. Dispersed camping would also have a minor negative long-term effect to areas that are highly desirable camping locations due to level surfaces and favorable views.

In summary, Alternative D would have an overall negative impact on the condition of grasslands and shrublands due to the increased recreational use and the modest vegetation restoration.

Rocky Balds and Bluffs

Under Alternative D, the BLM would be unlikely to treat non-native plants that are not invasive, such as the shallow rooted non-native grasses that are currently in some rocky balds and bluffs. The probable targets (e.g., Canada thistle) for treatments are typically found in the deeper soils of grasslands and forests. Therefore, it is unlikely that damage to vegetation, including moss and lichen, would occur from herbicides or mechanical treatment in this alternative. However, non-native plants would continue to compete with native plants in the rocky balds and bluffs. This would be a negative long-term impact.

As described above, trail miles in grasslands and shrublands would increase under Alternative D, leading to a related increase in impacts to rocky balds and bluffs associated with trail use. The BLM would continue to allow off-trail hiking under Alternative D and impacts to rocky balds and bluffs would be likely given that these areas often provide views. Off-trail travel over rocks can cause crushing and killing of lichens and mosses. These impacts are negative in both the short-term and the long-term.

The impact of new designated site camping on rocky balds and bluffs would depend on the eventual siting of the campsites. If sites were located on rocky balds and bluffs, it would have a major long-term effect on the resources found there, including the crushing of moss and lichen due to frequent use.

Conclusion

Table 12 qualitatively summarizes the effects of the alternatives on the condition of grassland and shrubland communities. It describes each alternative as causing an improvement, decline, or no change (+,-,=) in the condition of grassland and shrubland communities compared to current conditions.

Alternative C would have the most substantial long-term positive impacts due to its intensive restoration approach and limited recreational uses. The No Action Alternative and alternatives A and D would all cause a decline in grasslands conditions over time due to a lack of restoration treatments (in No Action and A) and their relatively extensive recreational use (in No Action and Alternative D). Alternative B would have a moderate positive impact on conditions due to its intensive restoration efforts, but would also have negative impacts due to increased dispersed camping in grassland and shrubland.

Table 12: Summary of effects of the alternatives on grassland and shrubland and rocky balds and bluffs

	No Action Alternative	Alternative A	Alternative B	Alternative C/Sub-C	Alternative D
Diversity and cover of native grassland species	-	-	+	+	-
Rocky balds and bluffs	-	-	+	+	-

Cumulative effects of the alternatives on grasslands and shrublands in the San Juan Islands

Throughout the Puget Lowland Ecoregion, which includes the San Juan Islands, both native and non-native grasslands are at an estimated 9 percent of pre-Euro-American settlement levels (Chappell et al. 2000). The Monument currently encompasses approximately 1 percent of the Southern Vancouverian Lowland Grassland and Shrubland occurring within the San Juan Islands. All grassland and shrubland in the San Juan Islands fall into this class.

Outside of the Monument planning process, other projects have the potential to benefit native grassland communities in the San Juan Islands. On June 5, 2012, the National Park Service published a notice of intent to prepare a Prairie Stewardship Plan and Environmental Impact Statement for the San Juan Island National Historical Park (National Park Service 2012). This would include restoration occurring in close proximity to the Monument land at Cattle Point. The Nature Conservancy has ongoing restoration projects on 11-acre Yellow Island, which has a small amount of grasslands.

Under the No Action Alternative and Alternative A, there would be an estimated 17 acres of grasslands and shrublands lost. This would decrease the total extent of this vegetation class in the San Juan Islands by 0.2 percent. The Monument would continue to include about 1 percent of grasslands and shrublands in the San Juan Islands. In addition, the condition of grasslands and shrublands would likely decline over time under this alternative and would contribute to the overall regional decline of this habitat.

Under Alternative B, there would be an estimated 394 acres of grasslands and shrublands gained, which would increase grasslands and shrublands in the San Juan Islands by approximately 4 percent. The diversity and cover of the native plant community in Monument grasslands and shrublands would improve over the life of the plan and provide some counter to the overall regional decline of this habitat.

Under Alternative C, there would be an estimated 361 acres of grasslands and shrublands gained, which would increase grasslands and shrublands in the San Juan Islands by approximately 3 percent. The diversity and cover of the native plant community in Monument grasslands and shrublands would improve over the life of the plan, and would provide some counter to the overall regional decline of this habitat. Under Sub-Alternative C, there would be long-term improvement in the diversity and cover of the native plant communities. This would be after a longer period of short-term disturbance that would be necessary to ensure invasive species removal without herbicides.

Under Alternative D, the Monument would continue to encompass approximately 1 percent of the grassland and shrubland vegetation in the San Juan Islands. The current level of invasive plant cover in the Monument would remain. Given the increased trail mileage under this alternative, the dispersal of invasive plant species throughout the San Juan Islands might increase due to more dispersed visitor traffic with limited treatment of invasive plants.

Nearshore Habitat and Nearshore Marine Plant Communities

While BLM administration, and so inclusion in the Monument, only applies above mean high tide, this document considers potential indirect effects on the condition of the nearshore marine environment surrounding the Monument. The alternatives vary in several ways that would affect nearshore habitat. Specifically, they vary in the recreational uses, road and trail networks, shoreline stabilization techniques, and projected extent of vegetation treatments that could influence sediment deposition in nearshore habits or, in the case of boat landing, cause direct impacts to these communities (Table 13).

The BLM assumes that an increase in vegetation treatments and/or road and trail miles in close proximity (200 feet) of nearshore habitats would lead to some increase in sediment deposition in these habitats. This sediment contribution distance is a conservative estimate based on forest floor travel from a culvert outlet (Dubé et al. 2004); sediment quantities would decrease exponentially after traveling from a source. It is not clear precisely how much of the sediment produced from trails would reach nearshore marine environments below mean high tide, due to abundant vegetation, duff, and porous surface soils between most trails and shorelines. Figure 4 compares the estimated annual treatment acres within 200 feet of the shoreline under each alternative. For effects from herbicide use, see Habitat and Plants Issue 6.

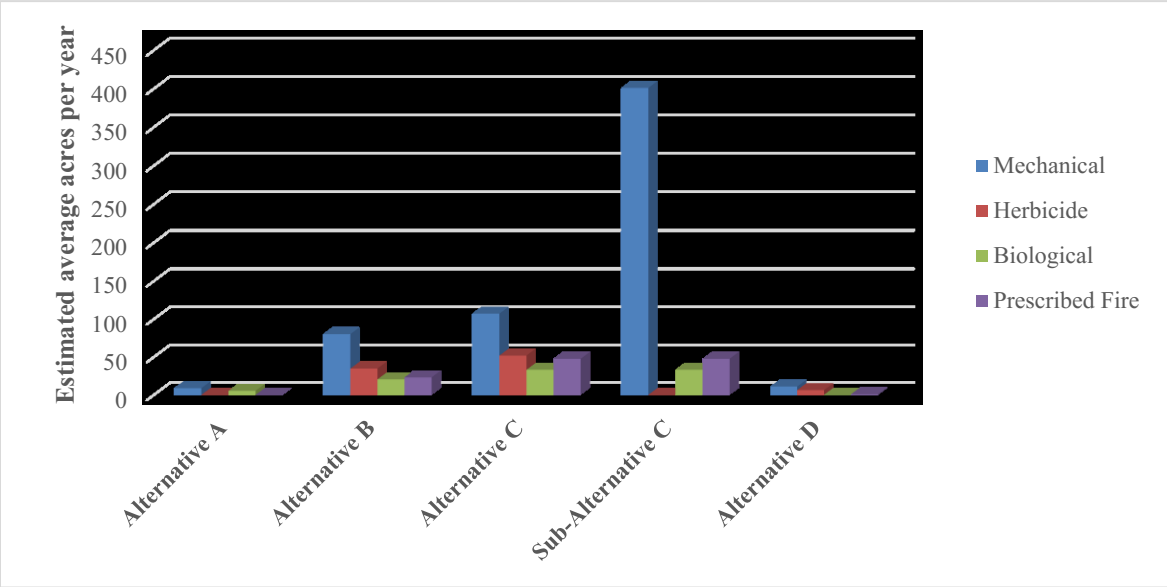


Figure 4: Estimated average treatment acres within 200 feet of shoreline per year
Note: 27 percent of the Monument falls within 200 feet of the shoreline. The BLM assumed that 27 percent of estimated treatment acres would occur within 200 feet of the shoreline.

Table 13: Recreational activities that could affect nearshore habitat by alternatives

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Shoreline open to recreational boat landing (miles)	21.2	0	16.4	17.8	21.2
Roads open to public motorized access within 200 feet of nearshore habitat (miles)	0.1	0*	0.1	0*	0*
Trails open to public access within 200 feet of nearshore habitat (miles)	8.7	0	9.4	6.3	12.3

*The BLM would close the 0.1 mile of existing road within 200 feet of the shoreline under alternatives A, C, and D, but would maintain it under all alternatives for authorized and administrative purposes.

No Action Alternative

Under the No Action Alternative, vegetation treatments would continue to be limited to hazard tree removal and limited mechanical treatments of invasive species (approximately 20 acres per year). This level of treatment would continue to cause negligible sediment delivery to nearshore habitats.

Under this alternative, 0.1 miles of Monument road at Turn Point (Stuart Island) would continue to be open to public motorized access within 200 feet of the shoreline; this road segment would likely continue

to be used almost exclusively for administrative purposes. There would also continue to be 8.7 miles of trails within 200 feet of the Monument shoreline (Table 13). All trails would continue to be open to all non-motorized uses, though hiking would likely continue to be the predominant mode of travel. These trails would continue to contribute approximately the current level of sediment to nearshore habitats.

Under the No Action Alternative, recreational boat landings could continue on all 21.2 miles of Monument shoreline. The number of landings would vary depending on the accessibility of the area and the approachability of the site. The BLM has no jurisdiction over boat mooring below mean high tide; however, the Monument would likely continue to draw visitors to moor at nearby sites. At the points of impact, boat landings and temporary moorings would lead to site-scale physical removal of plants such as eelgrass and bull kelp and disturbance of forage fish spawning sites (NOAA 2012, Pentilla 2007).

The BLM would continue to undertake shoreline stabilization as needed basis to protect cultural resources. While the BLM has only undertaken a limited amount (<0.1 mile of shoreline) of soft stabilization in the past, there are no existing plan decisions prohibiting hard shoreline stabilization. Impacts from soft stabilization projects would be relatively minor. Soft stabilization allows for the continued circulation of sediment, replaces unstable areas with native vegetation, and increases complexity through the placement of large logs. If applied, hard stabilization would lead to permanent removal of coastal strand and headland habitat in the stabilization footprint. Additionally, hard stabilization would lead to impacts associated with increased sediment delivery and reduced sediment detention (i.e., loss of accretion), reflected wave energy, and modified sand circulation/deposition (WDOE 2014). These indirect impacts would likely include increased disturbance and turbidity (i.e., cloudiness), which could lead to removal of adjacent nearshore habitat such as seagrass beds.

In summary, under the No Action Alternative, many nearshore communities within close proximity to the Monument would continue to be of moderately high quality. However, continued low levels of disturbance from recreational boat landing, small non-point source water quality impacts, small amounts of sediment delivery from nearby roads and trails would affect some nearshore habitats, particularly those with limited flushing or high use such as Watmough Bay (Christiaen et al. 2017).

Alternative A

Similar to the No Action Alternative, under Alternative A, the BLM would undertake negligible vegetation treatments that would affect nearshore habitat. Thus, succession would be the primary driver of changes in vegetation conditions in Monument lands adjacent to nearshore habitats. Although numerous non-native plants are present areas adjacent to nearshore environments, the majority of these species (e.g., tall fescue) are fully capable of stabilizing soils, and their continued expansion would not lead to additional sediment deposition. Sediment delivery from vegetation treatments would be expected to remain close to historical conditions.

Under Alternative A, no recreational use of the Monument would be allowed, though the BLM would continue to facilitate access for scientific, educational, cultural, and spiritual purposes. The BLM would close the 0.1 miles of road within 200 feet of the shoreline to public motorized access, though it would continue to maintain it for administrative use. The BLM would maintain trails as needed for authorized and administrative purposes; over time, the number of trail miles within 200 feet of nearshore habitats would decrease as trails returned to a natural state. Although some sources of sediment would remain, the vast majority of Monument trails would become vegetated quickly following restriction of access. Thus, Alternative A would produce less sediment delivery to nearshore habitats than the No Action Alternative.

Under this alternative, no recreational boat landings would occur on Monument shorelines. The annual number of landings would be dramatically reduced to only those necessary for authorized and administrative uses. This would minimize physical disturbance (including mechanical removal of plants), and allow nearshore plant cover (e.g., eelgrass beds) to persist or increase in currently disturbed areas. Restriction of boat landings would reduce non-point source toxicant impacts associated with fuel leaks. It would also minimize direct impacts to nearshore habitat in Watmough Bay, which is the single most

important forage fish spawning habitat area adjacent to the Monument. Minimization of disturbance would increase the quality and productivity of the nearshore habitats adjacent to Monument shoreline. Nearshore habitat (particularly seagrass beds) decline in Watmough Bay appears to be due to water quality more than disturbance (Christiaen et al. 2017); thus, improvement would be expected to be minor.

The BLM would only undertake soft stabilization to protect cultural resources under Alternative A. Impacts from soft stabilization projects would be the same as under the No Action Alternative.

In summary, under Alternative A, nearshore communities within close proximity to the Monument would continue to be of moderately high quality and would undergo minor improvement based on a reduction in disturbance and sediment deposition related to recreational boat landing and erosion from trails.

Alternative B

Under Alternative B, the BLM—likely working with tribes and other partners—would undertake extensive vegetation treatments to enhance limited plant communities and increase species and structural diversity (see Figure 4). Treatment locations would be determined during implementation.

Most areas treated would retain or quickly develop deep-rooted vegetation to prevent soil erosion. However, due to the estimated acres of treated area and removal of erosion-preventing plants, it is likely that increased sediment would reach nearshore habitat (WDOE 1993). Approximately 27 percent of the Monument lies within 200 feet of the shoreline, and ground disturbance would occur in much of this area during vegetation treatments. Alternative B would treat the largest extent (total acres), but Alternative C would involve more repeated treatments. Thus, Alternative B would deliver the second-most sediment associated with vegetation treatments to nearshore areas. Once new plant communities became established, sediment delivery would be reduced to approximately current levels.

Under this alternative, 0.1 miles of Monument road at Turn Point would continue to be open for public motorized access within 200 feet of nearshore habitat, though, if current trends continue, it would be used almost exclusively for administrative access. There would be an increase of approximately 0.6 miles of trails within 200 feet of the Monument shoreline compared to existing trail conditions (see Table 13). These trails would be open only to hiking. This approximately 7 percent increase in trails within 200 feet of the Monument shoreline would minimally increase the contribution of sediment to nearshore habitats compared to current conditions.

Under this alternative, the BLM would continue to allow recreational boat landings on 16.4 miles of Monument shoreline. This activity would be prohibited in all marine rocks and at Watmough Bay (see Appendix O for Category A Rocks, Category B Rocks, and Watmough Bay RMA frameworks).

The prohibition on recreational boat landings at Watmough Bay would minimize direct impacts to the single most important forage fish spawning habitat area adjacent to the Monument. The closure of rocks would further limit impacts to rocky intertidal and littoral zone resources. Impacts to the 16.4 miles of Monument shoreline that remain open to recreational boat landings would be the same as under the No Action Alternative. Thus, under Alternative B disturbance to littoral zone resources would decline compared to current conditions; there would be more disturbance than would occur under Alternative A.

Under Alternative B, the BLM could undertake hard shoreline stabilization, in addition to soft stabilization, as needed to protect cultural resources. Given the greater ecological impacts of hard stabilization, soft stabilization is likely to be used in most cases. The impacts of hard and soft stabilization are described under the No Action Alternative.

In summary, under Alternative B, nearshore communities in close proximity to the Monument would experience increased sediment deposition from vegetation treatments and trails. Locations that are closed to recreational boat landing would be less disturbed than the current condition. The combination of increased sediment delivery, reduced physical disturbance, and reduced pollution and toxicant delivery in some nearshore areas (particularly Watmough Bay) would lead to a slight reduction in quality for most

nearshore habitat adjacent to the Monument, with habitat condition improvement in areas with restricted boat landings. Sediment impacts would be predicted to decrease over the life of the plan.

Alternative C

Under Alternative C, the BLM—likely working with tribes and other partners—would undertake extensive treatments to approximate historic vegetation conditions within the Monument (see Figure 4).

Most areas treated would retain or quickly develop deep-rooted vegetation to prevent soil erosion. However, due to the estimated acres of treated area and removal of plants, it is likely that increased sediment would reach nearshore habitat. Approximately 27 percent of the Monument lies within 200 feet of the shoreline, and ground disturbance would occur in much of this area during vegetation treatments. Sediment delivery would likely be somewhat less than under Alternative B and Sub-Alternative C, but more than under the No Action Alternative and alternatives A and D. Once new plant communities became established, sediment delivery would be reduced to approximately current levels.

The BLM would close the 0.1 miles of road within 200 feet of the shoreline to public motorized access, though it would continue to maintain this road segment for administrative use. Alternative C would result in a decrease of approximately 2.5 miles of trails within 200 feet of the Monument shoreline compared to existing trail conditions (Table 13). The BLM would continue to allow equestrian use on approximately 2 miles of trail. This approximately 30 percent decrease in trail miles within 200 feet of the Monument shoreline would reduce the contribution of sediment to nearshore habitats compared to current conditions.

Under this alternative, the BLM would continue to allow recreational boat landings on 17.8 miles of Monument shorelines. This activity would be prohibited on smaller and/or more sensitive rocks; motorized boat landings would be prohibited at Watmough Bay (see Appendix O for Category B Rocks and Watmough Bay RMA frameworks).

The prohibition on motorized recreational boat landings at Watmough Bay would reduce the current level of direct impacts to the single most important forage fish spawning habitat area adjacent to the Monument; disturbance from non-motorized boats would continue. The closure of smaller and/or more sensitive rocks and rock grouping would limit impacts to rocky shoreline and littoral zone resources. Impacts to the remainder of the shoreline would be the same as under the No Action Alternative. Thus, under Alternative C, direct disturbance to littoral zone resources would decline compared to current conditions and Alternative D, but more disturbance would occur than under either Alternative A or Alternative B.

The BLM would only undertake soft stabilization of the shoreline to protect cultural resources under Alternative C. Impacts from soft stabilization projects are described under the No Action Alternative.

In summary, under Alternative C, nearshore communities in close proximity to the Monument would experience limited increased sediment deposition from vegetation treatments. Locations closed to recreational boat landing would fewer physical/ mechanical and water quality impacts than the current condition. As a whole, the condition of identified nearshore habitat adjacent to the Monument would be predicted to decline slightly in condition (quality), primarily through increased turbidity; this impact could be ameliorated by reduced water quality impacts associated with restrictions on boat landings.

Sub-Alternative C

The effects to nearshore habitats under Sub-Alternative C, would be similar to those under Alternative C. Under Sub-Alternative C, the acres of vegetation treatments would likely increase as the BLM attempted to achieve ambitious restoration objectives without the use of herbicide (see Figure 4). Treatment locations would be determined during implementation.

Although total acres of vegetation treatment under Sub-Alternative C would be similar to Alternative C, Sub-Alternative C would produce the most sediment deposition from vegetation treatments of any

alternative, due to intense mechanical treatments and multiple treatments required. Once new plant communities became established, sediment delivery would be reduced to approximately current levels.

Alternative D

Under Alternative D, the BLM would undertake relatively modest treatments to maintain approximate current conditions (see Figure 4). Treatment locations would be determined during implementation. Under this alternative, sediment deposition from vegetation treatments would increase slightly compared to current conditions, but would be substantially lower than under alternatives B and C.

The BLM would close the 0.1 miles of road within 200 feet of the shoreline to public motorized access, though it would continue to maintain this road segment for administrative use. There would be an increase of approximately 3.5 miles of trails within 200 feet of Monument shoreline compared to existing trail conditions (see Table 13). The BLM would continue to allow equestrian and bicycle use on 6.7 miles of trails. This 40 percent increase in trails within 200 feet of Monument shoreline would increase the contribution of sediment to nearshore habitats compared to current conditions.

Impacts from recreational boat landings would increase slightly under this alternative. Recreational boat landings could continue on all 21.2 miles of Monument shoreline and the BLM would increase the amount of designated site camping for visitors arriving by non-motorized boat. As a result, as campsites are developed during plan implementation landings at these locations would likely increase. The impacts from recreational shoreline would be the same type as those described under the No Action Alternative, but the frequency of direct disturbance would increase with the rate of recreational boat landings.

Under Alternative D, the BLM could undertake hard in addition to soft stabilization of shorelines, as needed to protect cultural resources outside of areas managed for their wilderness characteristics. Areas managed for their characteristics under Alternative D encompass 232 acres, including the east half of Patos Island and an array of rocks and islands. Given the greater ecological impacts of hard stabilization, soft stabilization is likely to be used in most cases even outside of areas with wilderness characteristics. Impacts from hard and soft stabilization are described under the No Action Alternative.

In summary, given increased direct impacts from recreational boat landings and increased sediment deposition from trails, the condition of nearshore habitats, including density of key structural species (such as eelgrass) and structural components (such as sand expanses or vegetation for spawning), could be slightly reduced under Alternative D compared with other alternatives.

Conclusion

Table 14 qualitatively summarizes the effects of the alternatives on the condition of nearshore habitats. It describes each alternative as causing an improvement, decline, or no change (+,-,=) in the condition of nearshore habitats compared to current conditions.

Alternative A would be most beneficial to nearshore habitats, as it would minimize sediment deposition, direct impacts from boat landings, and impacts from shoreline stabilization. Alternatives B, C, and D would likely cause a modest decline in nearshore habitat condition, due to increased sediment delivery. Under Alternative B, sediment deposition from both trails and vegetation treatments would increase and hard shoreline stabilization be allowed, though direct impacts from boat landings would decrease. Under Alternative D, sediment deposition from trails would increase as would direct impacts from boat landings.

Table 14: Summary of the effect of the alternatives on nearshore habitat

Condition of nearshore habitat	No Action Alternative	Alternative A	Alternative B	Alternative C /Sub- C	Alternative D
Impacts from sediment deposition	=	+	-	-	-
Direct disturbance from recreational boat landing	=	+	+	+	-
Potential disturbance from hard shoreline stabilization	=	+	=	+	+

The Cumulative Effect of the Alternatives on Nearshore Habitat in the San Juan Islands

Much of the shoreline within the Puget Sound has been modified (historically and recently) for agricultural, industrial, and residential uses. San Juan County has the lowest modification level in the Puget Sound region, with around 5 percent of its shorelines modified (Herrera 2011, Friends of the San Juans 2011). Over 600 marine shoreline alterations are present in San Juan County (San Juan County 2013); these modifications are part of the affected environment for the Monument and adjacent areas.

Many relatively minor alterations to the shoreline are permitted each year; most shoreline developments are residential (Kuller personal communication 2017). The largest recent developments are ongoing projects to expand/upgrade existing marinas at Snug Harbor on San Juan Island and at the Rosario Resort on Orcas Island. San Juan County recently completed a feasibility study to relocate approximately 1 mile of the Mackaye Harbor Road, which runs along the shoreline on the south end of Lopez Island and provides the closest public road access to Monument land at Iceberg Point (San Juan County 2017a). While San Juan County has not yet determined a course of action for Mackaye Harbor Road, given the continuing coastal erosion and projected increases in sea level, some action to move the road is more likely than not.

Given current recreation and visitation tends (see Recreation and Visitor Services Issue 1), the BLM assumes that recreation in the nearshore environment throughout the San Juan Islands would increase over the life of the plan. This would result in correlated indirect effects on nearshore habitat.

The BLM predicts that the effects of the No Action Alternative, Alternative B, and Alternative D, combined with foreseeable shoreline alterations outside of the Monument and increased recreation, would lead to an overall decline in nearshore habitat conditions adjacent to the Monument. This negative effect would be associated with (in order of severity of impact): boat landings, hard shoreline stabilization, and indirect sediment effects. The BLM predicts that alternatives A and C would lead to overall improved nearshore habitat conditions adjacent to the Monument, considering both positive (restrictions on landings and hard shoreline stabilization) and negative (temporary increases in sediment) impacts. The BLM estimates that at most <1 percent of extent of nearshore habitat types would be removed (due primarily to hard shoreline stabilization), <5 percent of nearshore habitats would experience slightly reduced habitat function (due to increased boat landings and increased sediment delivery), leading to minor and mostly temporary changes in the function of nearshore plant communities adjacent to the Monument.

Wetlands

The alternatives vary in several ways that would affect wetland functional condition (e.g., the hydrologic, vegetation, and erosion/deposition attributes of wetlands, as well as to the achievement of their ecological potential). Wetland potential is defined as the highest ecological status a wetland area can attain, given no social/political constraints. Specifically, the alternatives vary in the objectives and management direction that would drive vegetation treatments and in the type and extent of recreational use that would occur near wetlands (Table 15). Figure 5 compares the estimated annual treatment acres in wetlands under each alternative.

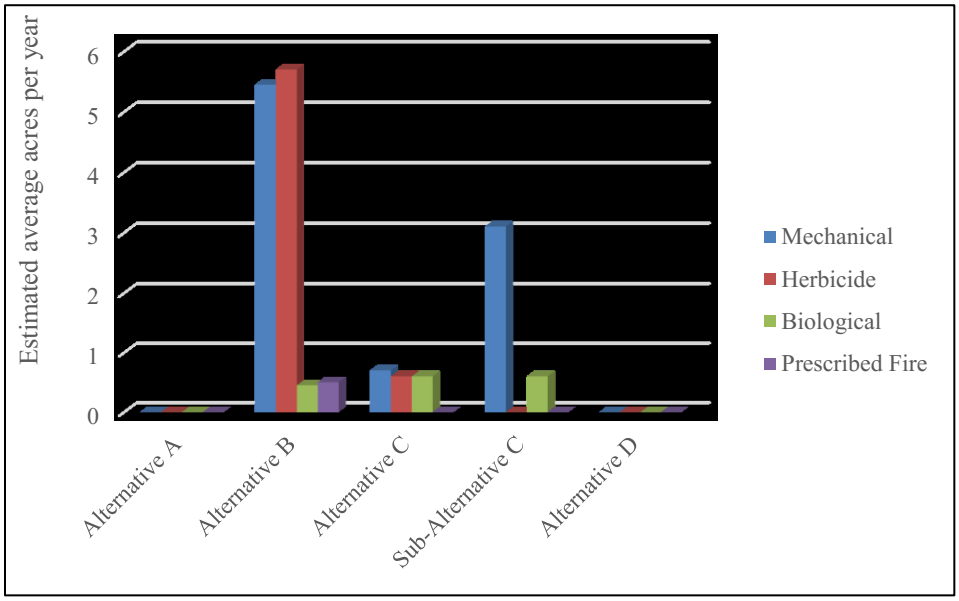


Figure 5: Estimated average acres of vegetation treatment in wetlands per year

Table 15: Recreational activities within 25 feet and 150 feet[41] of wetlands by alternative

		No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Public motorized use (road miles)	Within 25 feet	0	0	0	0	0
	Within 150 feet	0.1	0*	0.1	0.1	0.1
Hiking (trail miles)	Within 25 feet	0.3†	0	0.4	0.3	0.4
	Within 150 feet	0.9†	0	1.2	0.9	1.2
Equestrian (trail miles)	Within 25 feet	0.3†	0	0	0.1	0.3
	Within 150 feet	0.9†	0	0	0.5	1.1
Bicycling (trail miles)	Within 25 feet	0.3†	0	0	0	0.3
	Within 150 feet	0.9†	0	0	0	0.9

*The BLM would close all roads under Alternative A to public motorized use, but would maintain these roads, including 0.1 mile within 150 feet of wetland, for authorized and administrative purposes.

[41] Dube et al. (2004) conclude that sediment leaving a culvert or similar source and moving across vegetated areas (a situation conservatively comparable to the analysis area) move less than 150 feet in nearly all cases. The BLM specialist identified 25 feet as an appropriate buffer within to measure direct impacts to wetlands. See Appendix B for more information.

† Trails are currently open to all non-motorized uses. There is currently limited equestrian use at Chadwick Hill and Watmough Bay. There is no regular use of Monument trails by bicycles.

There may be some differences in sediment production between trail uses, with equestrian use appearing to produce the most sediment (Wilson and Seney 1994, Pickering et al. 2009).

No Action Alternative

Under the No Action Alternative, the BLM would continue to undertake negligible vegetation treatments that would affect wetlands. This analysis assumes that minimal wetland succession would occur in the Monument during the 20 years analyzed. Except at Point Colville, wetland vegetation attributes would continue to contribute to proper functioning condition over the next 20 years. The invasion of Sitka spruce into the Point Colville wetland would continue to contribute to that wetland functioning at risk. Non-native plant species would continue to represent a departure from site potential in all Monument wetlands. Contributions of non-point source pollution from upslope homes and agriculture would continue to represent a departure from site potential in some Monument wetlands.

Under the No Action Alternative, 0.3 miles of Monument trail would be within 25 feet of a wetland; 0.1 miles of road (at Watmough Bay) and 0.9 miles of trail would be within 150 feet of a wetland (see Table 15). Trail miles could increase over time due to continued social trail expansion. The No Action Alternative includes the second-most use by equestrian and the highest potential bicycle use of trails, suggesting the No Action Alternative would deliver the second-highest sediment to Monument wetlands.

Wetlands would continue to intercept sediments from trail-surface erosion and small amounts of toxicants from road and trail users—including, oils and gasoline from the Watmough Bay road and parking area and sunscreen, insect repellant, and other toxicants (Reidell 2006)—at approximately current rates. Sediment loads leaving trail surfaces would be approximately 1,500 pounds/ac./year (Reidell 2006), or approximately 750 pounds/year for all trails within proximity (150 feet) of wetlands in this alternative. Given that the depth of wetlands nearest to trails is over 3 feet and the fact that most trails are more than 25 feet away, sediment delivery would continue to have a minor to negligible impact on wetland function.

Sediment and toxicant introduction from road and trail use would have a very small indirect impact to wetland hydrology and erosion/deposition. This continued small contribution to sediment load would be unlikely to change soil saturation, water percolation, or wetland classification (e.g., emergent or open water status). Accumulation of sediment and toxicants would not affect wetland plant productivity or composition. Based on these factors, the BLM assumes that the continuation, or slight increase, of the level of recreational use near wetlands would not constrain wetland enlargement, impact wetland water quality enough to limit riparian-wetland plants, or impact flow patterns. Similarly, trail use adjacent to wetlands would continue to lead to negligible increases in chemicals and no impact on soil saturation in adjacent areas. Thus, wetland hydrology and erosion/deposition attributes would be similar to current conditions described above.

In summary, under the No Action Alternative, all Monument wetlands that are currently in proper functioning condition would most likely continue in this status over the next 20 years (see affected environment section). The continued lack of vegetation management under this alternative would allow the tree invasion at Point Colville to continue, further reducing wetland vegetation diversity and cover by wetland plants, and perhaps reducing the amount of soil saturation in this wetland. This is unlikely to result in substantial additional departure from wetland potential over the next 20 years, due to the slow pace of invasion, and the possibility of natural disturbance (wind throw) mitigating this invasion. Movement towards potential is unlikely due to the continued presence of non-native species.

Alternative A

Similar to the No Action Alternative, under Alternative A, the BLM would continue to undertake negligible vegetation treatments that would affect wetlands and would not apply herbicide. Only succession would actively change vegetation components of properly functioning condition. Except at

Point Colville, the vegetation attributes of the Monument's wetlands would continue contributing to proper functioning condition over the life of the plan. The invasion of Sitka spruce into the Point Colville wetland would continue to contribute to that wetland functioning at risk. Non-native plant species would continue to represent a departure from site potential in all Monument wetlands.

Under Alternative A, the BLM would not allow recreational use of the Monument, though it would facilitate access for authorized scientific, educational, cultural, and spiritual uses. The BLM would continue to maintain the 0.1 mile of road at Watmough Bay, which is within 150 feet of the Watmough marsh, for authorized and administrative purposes. The BLM would only maintain trails for regular authorized and administrative uses; as a result, the miles of trails within 25 and 150 feet of wetlands would decline over time as they return to a natural state due to lack of use.

Since trail use and density would decrease from the current condition, the BLM assumes that trail use would not constrain wetland enlargement, impact water quality, or impact flow patterns under Alternative A. Decreasing road and trail use would reduce the amount of toxicants introduced into wetlands. Thus, wetland hydrology and erosion/deposition would be similar to or improved compared to current conditions. This could improve wetland composition by allowing plant richness to increase from low (but sufficient to dissipate energy and filter sediment) to conditions closer to historic reference conditions.

In summary, under Alternative A, the wetlands currently achieving proper functioning condition would continue to do so and would come closer to achieving full potential due to the decline in trail density and use. The lack of vegetation management under this alternative would allow the tree invasion at Point Colville to continue, further reducing wetland vegetation diversity and perhaps reducing the amount of soil saturation in this wetland. This is unlikely to result in substantial additional departure from wetland potential over the life of the plan, due to the slow pace of invasion, and the possibility of natural disturbance (wind throw) mitigating this invasion.

Alternative B

Under Alternative B, the BLM—likely working with tribes and other partners—would undertake extensive work to enhance the condition and extent of wetlands (see Habitat and Plants Issue 3 for estimated treatment types and acres). Approximately 30 acres of the Monument that are currently classified as forest and woodland would be modified to support wetland characteristics, bringing the Monument's total wetland acres to approximately 75. Treated acres would enlarge existing wetlands. Wetland creation would require excavation and planting, and loss of existing forest plant communities.

Under this alternative, the BLM would treat current and new wetland acres to maintain or improve wetland function. To accomplish this objective, the BLM is likely to undertake treatments including herbicide application and planting of native wetland plugs. The BLM would also likely use mechanical treatments and, as useful, prescribed fire, to remove invading overstory trees that are reducing wetland function. Work to expand wetlands would have short-term negative impacts on existing wetland acres. Over the life of the plan, however, restoration work would improve wetland function and composition by improving vegetation age-class diversity and vigor and removing non-native and invading species.

Newly created wetland acres would initially have reduced function compared to existing wetland acres. There would be potential short-term water quality impacts from work to establish wetlands, and it would take time for new wetland acres to develop an age-class distribution of wetland plants with root masses capable of withstanding disturbance. Within 2 years, planted wetland vegetation would grow and be predicted to have high vigor and the ability to dissipate energy and filter sediment (Prichard 1999, p. 7).

Under Alternative B, there would be a 0.1-mile increase in trails within 25 feet of a wetland and a 0.3-mile increase in trails within 150 feet of a wetland. There would continue to be 0.1 miles of road within 150 of a wetland (see Table 15). The BLM would not allow off trail hiking, so proliferation of user created trails should be negligible. All trails would be open exclusively to hiking. Miles of trail within wetland buffer areas would increase somewhat as wetland acres expanded over the life of the plan.

The effect on wetland function from the 0.1 miles of road at Watmough Bay within 150 feet of a wetland would be the same as under the No Action Alternative. Impacts from trail use within 25 feet and 150 feet of a wetland would also be similar to the No Action Alternative (i.e., some deposition of sediment and toxicants in wetlands), but an additional 850 pounds/year of sediment would be associated with new trail area. This small increase in sediment would not be sufficient to change soil saturation, water percolation, or wetland classification (e.g., emergent or open water status) in existing or created wetland acres. Accumulation of sediment and toxicants would not affect wetland plant productivity or composition. Additional impacts from new trails would be slight and the BLM would not expect them to change the ratings of wetlands currently assessed as achieving proper functioning condition or as functioning at risk.

In summary, under Alternative B, treatments to enhance vegetation age-class diversity and vigor and remove non-native and invading species would cause an increase in the acres of existing wetland meeting properly functioning condition and a decrease in acres classified as functioning at risk over the life of the plan (i.e., at Point Colville). Wetland acres at potential would increase over time, though roads and trails (both new and existing) would ultimately constrain the potential of some wetlands.

Alternative C

Under the objectives for Alternative C, the BLM—likely working with tribes and other partners—would undertake extensive work to improve the condition of wetlands within the Monument in an attempt to approximate historic conditions (see Habitat and Plants Issue 3 for estimated treatment types and acres). Unlike Alternative B, the BLM would not enhance the size of wetlands under this alterative.

Under Alternative C, the BLM would use mechanical, manual, biological control, chemical, and fire treatment methods to approximate historic wetland conditions. This would include elimination of non-native vegetation in wetlands and removing invading overstory trees that are reducing wetland function. Over the life of the plan, these treatments would increase native wetland plant composition, vigor, and age class distribution. These treatments would have negligible impact on wetland hydrology or erosion/deposition. Treatment types under Alternative C would be comparable to Alternative B, with the exception of excavation, which would not occur under Alternative C.

Under Alternative C, trails throughout the Monument would decrease; trail miles within 25 feet of a wetland would increase very slightly (<0.1 mile) and trail miles within 150 feet of a wetland would decrease very slightly (<0.1 mile). The BLM would not allow off trail hiking, so proliferation of user created trails should be negligible. Because there would be effectively no change in trails, the impact to wetland function and composition would be the same as the No Action Alternative.

Under Alternative C, 0.1 miles of trail within 25 feet of a wetland and 0.5 miles of trail within 150 feet of a wetland would continue to be open to equestrian use (see Table 15). Monument trails are currently open to all non-motorized uses; it is possible that explicit management of certain trails for equestrian use would increase participation in this activity. Equestrian trail use may produce more sediment than other trail uses (Pickering et al. 2009). The BLM would allow this use on a limited number of trails under Alternative C, but on fewer trails than under the No Action Alternative or Alternative D.

In summary, under Alternative C, the BLM would expect all Monument wetlands (i.e., 42 acres) to achieve proper functioning condition over the life of the plan. Most of these wetlands would move closer to potential through treatments to approximate historic conditions.

Sub-Alternative C

The effects to wetland condition under Sub-Alternative C would be similar to those under Alternative C, but less positive. Sub-Alternative C would produce wetland conditions comparable to conditions in the affected environment, with approximately the current amount of wetland area achieving proper functioning conditions (i.e., 40 acres) and functioning at risk (i.e., 2 acres). However, few to none of the Monument's wetlands would achieve potential under this alternative.

Mechanical removal of invading Sitka spruce at Point Colville would be effective, but any invading understory species would be difficult to control without herbicides. Although some invasive non-native wetland plants can be controlled through biological control—or, on small spatial scales, through mechanical control—without herbicide treatments it is likely that non-native species would continue to increase. While they have only small impact on wetland function, these non-native species represent a departure from site potential, as well as from historic conditions.

Alternative D

Under Alternative D, the BLM would undertake treatments to maintain wetlands in approximate current condition (see Habitat and Plants Issue 3 for estimated treatment types and acres). Unlike Alternative B, the BLM would not enhance the size of wetlands under this alterative. Since negligible succession would occur in wetlands over the life of the plan, management in these wetlands would include minor control efforts to maintain invading non-native and native species at their approximate 2016 levels. Some wetland treatments would likely be necessary to counteract impacts from the elevated level of recreation disturbance under Alternative D (see below).

Roads and trail miles within 25 feet and 150 feet of a wetland would be approximately the same as under Alternative B. There would be a 0.1-mile increase in trails within 25 feet of a wetland and a 0.3-mile increase in trails within 150 feet of a wetland. There would continue to be 0.1 miles of road within 150 feet of a wetland. The BLM would continue to allow off trail hiking under this alternative, so some proliferation of user created trails could continue. As described under Alternative B, trail use could lead to a slight increase in sediment and toxicant deposition in wetlands.

Under Alternative D, 0.3 miles of trail within 25 feet of a wetland would continue to be open to equestrian and bicycle use. Within 150 feet of a wetland, 1.1 miles of trail would continue to be open to equestrian use and 0.9 miles of trail would continue to be open to bicycle use (see Table 15). Monument trails are currently open to all non-motorized uses; it is possible that explicit management of certain trails for equestrian use would increase participation in this activity. Of the action alternatives, Alternative D would have the highest number of trail miles open to equestrian use and would be predicted to produce the most sediment from trail use of any alternative (Wilson and Seney 1994, Pickering et al. 2009).

In summary, under Alternative D there would continue to be approximately the current amount of wetland area achieving proper functioning conditions (i.e., 40 acres) and functioning at risk (i.e., 2 acres), due to management efforts to retain current conditions. The Monument's wetlands would continue to not achieve potential over the life of the plan due to the lack of management action to improve wetlands and the increase in trail disturbance.

Conclusion

Table 16 qualitatively summarizes the effects of the alternatives on wetlands. It describes each alternative as causing an improvement, decline, or no change (+,-,=) in wetland condition compared to current conditions.

Alternative C would lead to all existing Monument wetlands achieving proper wetland function and at or approaching potential. Alternative B would increase the total number of wetland acres, and the total number of acres in proper functioning condition, though not all created wetland areas would be expected to be achieve proper functioning condition within the life of the plan. The No Action Alternative—by continuing negligible wetland treatments and current levels of recreation—would result in the least amount of wetland acres achieving proper functioning condition and approaching potential.

Table 16: Summary of the effects of the alternatives on wetland condition

Impact to wetland	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Proper functioning condition	=	=	+	+	=

Movement towards potential	=	+	+	+	=

The Cumulative Effect of the Alternatives on Wetlands in the San Juan Islands

Freshwater wetlands are relatively limited in the San Juan Islands. Approximately 20 percent of the wetland resources in the San Juan Islands have been classified as potentially disturbed (WDOE 2011b).

The following actions would affect the size and condition of wetland habitat in the San Juan Islands: private filling of wetlands for development, private creation and enhancement of wetland areas for wetland mitigation, State and Federal wetland enhancement and creation (e.g., work at Odlin Park).

In recent years, San Juan County and private landowners in the islands have undertaken wetland enhancement and creation on Lopez Island. Private landowners, working with Ducks Unlimited, intend to continue projects to enhance and create wetlands. Because of this, it is reasonably foreseeable that the total acreage of wetland in the San Juan Islands will increase over the life of the plan.

Development of wetlands is regulated by the Clean Water Act and State regulations including the Joint Aquatic Resources Permit Application. The BLM does not know of any major new private development projects that would require wetland mitigation in the planning area.

The Monument currently encompasses approximately 1 percent of the Vancouverian Flooded and Swamp Forest and approximately 6 percent of the Vancouverian Lowland Wet Shrubland, Wet Meadow, and Marsh in the San Juan Islands. This would remain unchanged except under Alternative B, where the Monument's contribution to wetlands in the San Juan Islands would increase by 33 acres and would represent approximately 2 percent and approximately 10 percent of these wetland classes respectively. None of the alternatives would cause Monument wetlands to fall into a non-functioning condition; under alternatives A, B, and C, the condition of wetlands within the Monument would move closer to potential.

Habitat and Plants Analytical Issue 3: *How would the alternatives vary in the approximate extent and type of vegetation treatments the BLM would apply during their implementation?*

See Appendix B for analytical methods used in this analysis. See the Habitat and Plants Analytical Issue 3 section in Appendix E for definitions of the types of treatments described in this section (i.e., mechanical, biological, prescribed fire, and herbicide).

Affected Environment

Vegetative treatments within the Monument are currently limited to hazard tree management and the limited treatment of invasive plant populations with hand tools. In total, the BLM undertakes approximately 20 acres of vegetation treatments per year. There is currently no prescribed fire, biological, or chemical (e.g., herbicide) treatments occurring within the Monument.

Effects of the Alternatives

The alternatives vary substantially in the vegetation treatments that would be necessary to meet their objectives for habitat and plant communities. The acres of treatments estimated here are not management direction. The actual locations, sizes, and management tools used would be determined during the implementation-level planning and NEPA compliance processes.

The acres described below are conservative estimates (i.e., they are likely somewhat higher than the acreages of treatment that would take place). In many cases, the described treatments would take place on the same acres of land. For example, mechanical or manual treatments to remove woody shrubs and subsequent planting of native plants would be likely to take place in the same area. Similarly, the same acres could undergo mechanical or manual treatments before and after a prescribed fire.

Under all alternatives, the BLM would plant and seed after treatments, as necessary.

No Action Alternative

Under the No Action Alternative, the BLM would continue its current custodial management approach with approximately 20 acres per year of hazard tree management and non-ground disturbing invasive plant treatment. If current trends continue, there would be no prescribed fire, biological, or herbicide use.

Alternative A

Table 17 provides an overview of the treatment acres and repetition rates the BLM estimates would be necessary to achieve the Alternative A vegetation objectives. The table is followed by a description of the types of treatments the BLM might undertake. See page 17 in Chapter 2 for Alternative A habitat and plants objectives. The BLM does not project that the plant communities would cross the Alternative A extent thresholds identified in Chapter 2 during the life of the plan (see Table 7 on page 75). Given that some plant communities within the Monument had 45 percent non-native cover in 2014 (BLM 2014a), the invasive plant threshold identified in Chapter 2 is likely to be crossed within the life of the plan.

Table 17: Estimate of treatment acres under Alternative A

	Mechanical Treatment		Biological Treatment	
	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years
Grassland & Shrubland				
Treatment to reduce/ control non-native plants	65	10	65	6
Average Annual Acres over 20 years	**33**		**20**	
Total Acres	**650**		**390**	

Note: these acres are the BLM's estimates of the extent and repetition of vegetation treatments that might be necessary to achieve the alternative's objectives. The actual extent, type, and timing of treatments would be determined during plan implementation through project-level planning and NEPA compliance.

Forest and Woodland

Other than for hazard trees, vegetation treatments in forest would be unlikely under Alternative A.

Grassland and Shrubland

In order to control invasive plants, treatments in grasslands under Alternative A could include cutting, grubbing, mowing, brushing, trimming, weed eating, hand pulling, pulling with tools, and clipping. The BLM would prohibit herbicides, so mechanical treatments would be relatively frequent, especially for rhizomatous species such as Canada thistle and blackberry.

Biological treatments would use either livestock, such as goats, to target dense patches of invasive plants or APHIS approved biological agents, for species, such as Canada thistle, with approved agents.

Wetland

Vegetation treatments in wetlands are unlikely under Alternative A.

Alternative B

Table 18 provides an overview of the treatment acres and repetition rates the BLM estimates would be necessary to achieve the vegetation objectives for Alternative B. The table is followed by a description of the types of treatments that the BLM might undertake to achieve the objectives.

Table 18: Estimate of treatment acres under Alternative B

	Mechanical Treatment		Herbicide Treatment		Biological Treatment		Prescribed Fire	
	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years
Forest & woodland								
Treatment to maintain or open canopy	400	1.5 (repeated twice for half the acres)					63	3
Treatment of forest understory	200	2	100	2				
Grassland & shrubland								
Treatment to reduce or eliminate woody shrubs	200	5	200	5			200	2
Treatment to reduce encroaching trees	410	2	50	5			50	2
Treatment to reduce/ control non-native plants	100	5	200	5	300	5	200	3
Treatment to restore native plants	500	5					135	3
Wetland								
Treatments to restore existing wetlands	3	2	5	3	1	3		
Planting to facilitate development of functional wetlands	2	2						
Treatment to expand wetlands	33	3	33	3	3	2	5	2
Average Annual Acres over 20 years	**296**		**128**		**75**		**85**	
Total Acres	**5,929**		**2,564**		**1,509**		**1,704**	

Note: these acres are the BLM's estimates of the extent and repetition of vegetation treatments that might be necessary to achieve the alternative's objectives. The actual extent, type, and timing of treatments would be determined during plan implementation through project-level planning and NEPA compliance.

Forest and Woodland

In order to enhance older forest characteristics and oak woodlands under Alternative B, as well as to enhance resistance to and resilience from fire and other disturbances, the BLM would undertake treatments affecting the forest canopy and understory.

Treatments in forests and woodlands could include canopy and low thinning to reduce canopy cover, and lighter thinning (mostly low thinning) to maintain canopy cover, using feller bunchers, chainsaws, hand tools, and/or prescribed fire. Accessible areas would have cut materials removed to reduce fire danger.

Treatments to thin understory trees and brush enhance older forest characteristics and tree woodlands including oak woodlands, could include cutting, mowing, chipping, pulling, clipping, herbicide application, and prescribed burning. Some woodland treatments would result in tree savannas.

Grassland and Shrubland

In order to enhance the extent of grasslands and maximize native grassland species richness under Alternative B, the BLM would undertake a variety of treatments to remove trees, control invasive plant species, remove woody shrubs, and restore native plants. This alternative would not eradicate shrubs, but would remove them to the extent necessary to maximize species richness and structural diversity of forbs.

Treatment of woody shrubs could include removal of both above and below ground structures of rose, snowberry, blackberry, and other shrubs using cutting tools as well as digging. Broadcast burning could be used to clear above ground biomass of woody shrubs; this would kill some species, but some may re-sprout. The BLM would likely use herbicides to kill below ground shrubs following above ground removal, especially in culturally sensitive areas where ground disturbance is not recommended.

Treatments to remove trees and convert understory of current forest to grasslands and shrublands and tree savannas could involve mechanically cutting trees and removing stumps as well as non-grassland shrubs such as salal. The BLM would likely remove young trees that seed into grassland edges mechanically by cutting them with saws close to the soil surface. The BLM could apply herbicides to trees and non-grassland understory plants in areas identified for conversion to grassland. Prescribed fire could be used to remove residual forest species, control tree encroachment, and maintain grasslands once established.

Treatments to control non-native plants could include mowing thick stands of non-natives or hand-cutting individual plants. The BLM would likely apply herbicide via backpack sprayers and would target noxious and invasive weeds. Prescribed fire in the form of broadcast burns could be applied to kill non-native plants after grasslands are expanded. The disturbance created by the conversion of forest to grassland under this alternative would create opportunities for invasive plants, requiring relatively extensive and frequent treatments for invasive plants. Biological treatments using livestock, such as goats, could be used to target dense patches of invasive plants. APHIS approved biological agents could also be used to control species, such as Canada thistle, with approved agents.

Treatment to restore native plants could include planting native grass and forb plugs in grasslands. Native seed could be broadcast and raked in or drill seeded to increase diversity. The BLM would also likely use prescribed fire to prepare a site for planting and maintaining grassland habitat. Planting and seed mixes would include culturally important plants as appropriate to the site.

Wetland

In order to enhance the extent of wetlands and maximize native hydrophytic (i.e., aquatic) plant species richness and wetland processes (e.g., anaerobic conditions) under Alternative B, the BLM would undertake a variety of treatments to expand wetland acres and restore existing wetlands.

Treatments to restore existing wetlands could include mechanical removal of over-story trees invading wetlands using chainsaws. Hand application (wicking, wiping) of herbicide approved for aquatic uses by the EPA and the BLM could be used to control invading non-native species such as reed canary grass, yellow flag iris, Canada and Scotch thistle, and poison hemlock. APHIS approved biological agents could also be used to control species, such as Canada thistle, with approved agents.

Mechanical actions could include removal of vegetation and excavation to allow for low-density planting of individual plugs (seedlings) in order to increase native wetland species richness in areas dominated by one or few species (e.g., *Carex obnupta* at the Point Colville wetland). Plantings could include native grown seedlings such as soft rush (*Juncus effusus*) or forbs (*Angelica genuflexa*, *Stachys cooleyea*). In general, seeding, as opposed to planting, is unlikely to be used in existing wetlands since competition with existing wetland species (mostly native) would be high and seed germination and survival low.

Mechanical treatments to increase the total size of wetlands could include excavation of existing upland and forested areas. Excavation could remove soil to achieve elevations producing a range of conditions from lake with vegetated bottom to emergent wetland with hydric soils and hydrophytic plants but dry

conditions for much of the summer. Excavation could require medium tracked excavators and could focus on the upland perimeters of existing wetlands.

The BLM could apply prescribed fire to control non-native rhizomatous species in newly-created wetlands. Hand application (wicking, wiping) of herbicide approved for aquatic uses by the EPA and the BLM could be used to minimize establishment of invasive plant species in newly-created wetlands.

Alternative C

Table 19 provides an overview of the treatment acres and repetition rates the BLM estimates would be necessary to achieve the vegetation objectives for Alternative C. The table is followed by a description of the types of treatments the BLM might undertake to achieve the objectives.

Table 19: Estimate of treatment acres under Alternative C

	Mechanical Treatment		**Herbicide Treatment**		**Biological Treatment**		**Prescribed Fire**	
	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years
Forest & woodland								
Treatment to maintain or open canopy	400	2					63	3
Treatment of forest understory	200	4	100	4				
Grassland & shrubland								
Treatment to reduce or eliminate woody shrubs	200	5	200	5			200	2
Treatment to reduce encroaching trees	378	2	60	5			60	2
Treatment to reduce/ control non-native plants	487	5	425	5	487	5	487	5
Treatment to restore native plants	425	5					125	3
Wetland								
Treatments to restore existing wetlands	3	4	3	4	3	4		
Planting to facilitate development of functional wetlands	1	2						
Average Annual Acres over 20 years	**397**		**192**		**122**		**176**	
Total Acres	**7,930**		**3,837**		**2,447**		**3,519**	

Note: these acres are the BLM's estimates of the extent and repetition of vegetation treatments that might be necessary to achieve the alternative's objectives. The actual extent, type, and timing of treatments would be determined during plan implementation through project-level planning and NEPA compliance.

Forest and Woodland

In order to approximate the less densely vegetated conditions that relatively frequent, low intensity fires would have historically produced, the BLM would undertake treatments affecting the forest canopy and understory. The types of treatments that would occur under Alternative C are the same as under Alternative B, though the extent and repetition is likely to be greater to achieve the objectives.

Grassland and Shrubland

In order to enhance the extent of grasslands and approximate the more open conditions and native species composition that would have occurred historically, the BLM would undertake a variety of treatments to remove trees, control invasive plant species, remove woody shrubs, and restore native plants. The types of treatments that would occur under Alternative C are the same as those that could occur under Alternative B, though the extent and repetition of treatments is likely to be greater in order to maximize the cover of native vegetation and enhance culturally important plant communities.

Wetland

In order to approximate historic wetland conditions, the BLM would undertake a variety of treatments to expand wetland acres and restore existing wetlands. This would include removing non-native wetland species, reestablishing or enhancing native wetland species, and removing native trees that are encroaching on existing wetlands. The types of treatments that would occur under Alternative C are the same as under Alternative B, except that there would be no expansion of wetlands under Alternative C.

Sub-Alternative C

Table 20 provides an overview of the treatment acres and repetition rates the BLM estimates would be necessary to achieve the vegetation objectives for Alternative C. Under Sub-Alternative C, the BLM would prohibit herbicide treatments. All other treatments types under this alternative would be the same as under Alternative C, except that the repetition rate of mechanical treatments would need to be much higher to achieve Alternative C's ambitious objectives without the use of herbicides.

Table 20: Estimate of treatment acres under Sub-Alternative C

	Mechanical Treatment		Biological Treatment		Prescribed Fire	
	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years
Forest & woodland						
Treatment to maintain or open canopy	400	2			63	3
Treatment of forest understory	200	20				
Grassland & shrubland						
Treatment to reduce or eliminate woody shrubs	200	20			200	2
Treatment to reduce encroaching trees	378	20			60	2
Treatment to reduce/ control non-native plants	487	20	487	5	487	5
Treatment to restore native plants	425	5			125	3
Wetland						
Treatments to restore existing wetlands	3	20	3	4		
Planting to facilitate development of functional wetlands	1	2				
Average Annual Acres over 20 years	**1,414**		**122**		**176**	
Total Acres	**28,287**		**2,447**		**3,519**	

Note: these acres are the BLM's estimates of the extent and repetition of vegetation treatments that might be necessary to achieve the alternative's objectives. The actual extent, type, and timing of treatments would be determined during plan implementation through project-level planning and NEPA compliance.

Alternative D

Table 21 provides an overview of the treatment acres and repetition rates the BLM estimates would be necessary to achieve Alternative D vegetation objectives. The table is followed by a description of the types of treatments the BLM might undertake. The BLM would allow biological control under this alternative, but did not estimate that it would be necessary to achieve Alternative D objectives.

Table 21: Estimate of treatment acres under Alternative D

	Mechanical Treatment		**Herbicide Treatment**		**Prescribed Fire**	
	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years	Acres	# of treatments over 20 years
Forest & woodland						
Treatment to maintain or open canopy	100	5				
Grassland & shrubland						
Treatment to reduce or eliminate woody shrubs	25	5	25	5	25	2
Treatment to reduce encroaching trees	17	5	2	5		
Treatment to reduce/control non-native plants	5	10	65	5		
Treatment to restore native plants	10	5				
Average Annual Acres over 20 years	**41**		**23**		**3**	
Total Acres	**810**		**460**		**50**	

Note: these acres are the BLM's estimates of the extent and repetition of vegetation treatments that might be necessary to achieve the alternative's objectives. The actual extent, type, and timing of treatments would be determined during plan implementation through project-level planning and NEPA compliance.

Forest and Woodland

In order to maintain current forest and woodland conditions under Alternative D, the BLM would undertake treatments affecting the forest canopy and understory.

Where monitoring indicates that forest and woodland canopies are becoming more closed, the BLM could undertake light thinning (mostly low thinning) to maintain the current density of canopy cover using feller bunchers, chainsaws, hand tools, and/or prescribed fire. Accessible areas would have cut materials removed to reduce fire danger.

Where monitoring indicates that forest and woodland understory is becoming denser or changing composition during the life of the plan, the BLM could undertake thinning of understory trees and brush, including by cutting, mowing, chipping, pulling, clipping, herbicide application, and prescribed burning.

Grassland and Shrubland

When monitoring indicates that encroachment by forest and shrub species is increasing in grassland and shrublands, that non-native plant cover is increasing, or that sensitive or culturally important plant populations are decreasing, the BLM would undertake a variety of treatments to remove trees, control invasive plant species, remove woody shrubs, and restore native plants. Treatment types would be similar

to those described under Alternative B, except that the BLM would not convert current forest and woodland acres to grasslands and shrublands.

Wetland

The BLM estimates that no treatments would be necessary to maintain wetlands in the approximate current conditions. If monitoring identifies changes to conditions, treatments similar to those described under Alternative B could be undertaken, except that no expansion of wetlands would occur.

Habitat and Plants Analytical Issue 4: *How would the alternatives affect special status plants and lichen and Washington Natural Heritage Program priority ecological communities?*

See Appendix B for analytical methods used in this analysis.

Background

Special Status Plants

Special status plants are those included on the Oregon/Washington State Director's Special Status Species List. This list includes three categories: 1) species listed or proposed for listing under the Endangered Species Act (ESA), 2) species designated as sensitive species by the BLM State Director, and 3) species designated as strategic by the BLM State Director. For more information on the special status species list and the BLM's general objectives for managing these species, see Appendix E.

Washington Natural Heritage Program (WNHP) priority ecological communities

In addition to special status plants, this document also considers priority ecological communities, which NatureServe and the WNHP have identified and ranked (WDNR 2007, 2011). The importance of the communities identified here is that they are, on a statewide or global scale, becoming more scarce or compromised. For more general information about WNHP priority communities see Appendix E.

Affected Environment

Special Status Plants and Lichen

Proclamation 8947 referred to the federally threatened golden paintbrush (*Castilleja levisecta*), which is a regional endemic of open grasslands in the Puget Trough. There are no known occurrences of golden paintbrush within the Monument; however, six other special status plant or lichen species do occur within the Monument (see Table 22). Golden paintbrush is considered critically imperiled at both State and global levels, with a NatureServe rank of G1S1 (NatureServe 2015). A recovery plan for the golden paintbrush was published in 2000 (U.S. FWS 2000) with additional conservation measures added in 2010 (U.S. FWS 2010b) . The recovery actions focus on the reintroduction of the species into likely historical habitat. Through reintroductions in Oregon and Washington, there are now 40 known populations of golden paintbrush (U.S. FWS 2015) .

Golden paintbrush has been documented at several sites in the San Juan Islands, but there are no known current populations within the Monument. In 2012, there was a small reintroduction program in the San Juan Islands, including a site at within the Monument at Iceberg Point, to determine survivability of introduced plants. By 2015, the single reintroduction plot at Iceberg Point contained zero plants. Despite the results of the test plot, the Monument's grasslands have the potential to support a population of the plant through reintroductions. Under current management, the grassland community that provides potential habitat for golden paintbrush within the Monument would continue to decline due to encroachment by shrubs and forest species, and persistence of non-native species.

Four of the six known or historically known (golden paintbrush) species of rare plants documented in the Monument occupy open grassland habitats (see Table 22). Bear's-foot sanicle (*Sanicula arctopoides*) occupies coastal bluffs and grassy sand dunes and Niebla lichen (*Niebla cephalota*) is an epiphyte that lives on the lower branches of conifers, generally within sight of open water. Suspected (but not documented) special status plant species' habitats are described in Table 23.

Single populations of slender crazyweed and white-topped aster—both Washington State sensitive species—have been documented at Iceberg Point. Signs of trampling are evident on the slender crazyweed and white-topped aster populations. The white-topped aster population is bisected by a trail, and some slender crazyweed individuals are impacted when visitors step off trail to reach overlooks.

Slender crazyweed has a G5S2 NatureServe ranking, which is state imperiled yet globally secure. Within the San Juan Islands, slender crazyweed occurs only along the southern end of Lopez Island. Outside of the islands, slender crazyweed is also extant in Okanogan, Jefferson, and Clallam counties in Washington State.

Limited populations of California buttercup (*Ranunculus californicus* var *californicus*) are known to occur within the Monument at Iceberg Point. An additional historical occurrence was recorded at Point Colville. Other occurrences of California buttercup have been mapped on non-Monument lands on Lopez and San Juan Island, but only about 5 recent sites are known throughout the San Juan Islands (Camp and Gamon 2010; WDNR 2015). California buttercup has a G5S1 ranking, which indicates it is critically imperiled in the state of Washington (S1) and secure globally (G5, NatureServe 2015). It is listed as threatened by Washington State (WDNR 2018).

White-topped aster is a regional endemic and ranked as G3S3, which corresponds to vulnerable in Washington State and vulnerable with a moderate risk of extinction globally. The white-topped aster population at Iceberg Point is the only population documented in the San Juan Islands and is the northernmost population in Washington State. White-topped aster is otherwise restricted to the Willamette Valley and Puget Lowlands (Camp and Gamon 2010). This species is listed as threatened by the State of Oregon; a very small number of populations occur in the lowlands of the Willamette Valley. Conifer encroachment and competition by non-native shrubs and grasses is a substantial threat to this species (NatureServe 2015).

Niebla lichen is documented on Point Colville and mentioned in Rhoades (2009) as commonly found on Iceberg Point on shaded branches of Douglas-fir in transitional woods. This lichen was elevated in rank to being BLM sensitive in 2015 and is WNHP Sensitive. NatureServe ranked this lichen as G3G4S2, which is globally vulnerable and imperiled in the state.

Bear's-foot sanicle is documented on two of the Monument islands off of Orcas Island (WNHP 2018). This species has a ranking of G5S1, which is globally secure yet critically imperiled in Washington State. This BLM sensitive plant is maritime, found on coastal bluffs and grassy sand dunes near salt water from Vancouver Island, British Columbia (Canada), to Santa Barbara, California. It is often in association with red fescue, rose, and western buttercup.

Table 22: Special status plants and lichen currently or historically within the Monument

Species Name	Federal Status	State Status	BLM Status	Associated Habitat within the Monument[1]
Bear's-foot sanicle (*Sanicula arctopoides*)		E	Sen	Coastal bluffs and grassy sand dunes near salt water
California buttercup (*Ranunculus californicus* var *californicus*)		T	Sen	Open grasslands
Golden paintbrush (*Castilleja levisecta*)	T	T		Open grasslands
Niebla lichen (*Niebla cephalota*)		S	Sen	Epiphyte on lower conifer branches
Slender crazyweed (*Oxytropis campestris* var *gracilis*)		S	Sen	Open grasslands and rocks
White-topped aster (*Sericocarpus rigidus*)		S	Sen	Open grasslands

Sources: Bureau sensitive plants documentation source: GeoBOB and WNHP databases, BLM files.
Sen=BLM sensitive, Str=BLM strategic, S=sensitive, T=threatened, E=endangered, X=believed to be extirpated in the state.
[1]Habitat descriptions from Camp and Gamon 2010 except for Rhoades 2009 for *Niebla cephalota*

Table 23 describes rare plant species that are known to occur in San Juan County but have not been documented in the Monument. The BLM considers these species to be suspected within the Monument—a suspected species is one that is not documented on land administered by the BLM, but may occur because the land is within the species' range and appropriate habitat is present or there are known occurrences of the species (historic or current) in the vicinity (BLM 2015a).

Table 23: Special status plants and lichen in San Juan County not documented in the Monument

Species	Associated Habitat*	State/Federal status/Rank	Documented in the Monument?	General location(s) †
Adder's-tongue (*Ophioglossum pusillum*)	seasonally wet areas in bogs, fens, wet meadows, moist woods, and other settings	S/Sen/G5S2	No	Orcas Island
Blunt-leaf pondweed (*Potamogeton obtusifolius*)	submerged on banks of lakes, sloughs, and slow-flowing streams in 1-4 m of water	S/Str/G5S2	No	Orcas and San Juan Island
Bog twayblade (*Liparis loeselii*)	springs, bogs, wetlands, and wet sunny areas in Douglas-fir forests	E/Str/G5S1	No	Orcas Island
Erect pygmy-weed (*Crassula connata*)	wet to moist vernal pools on coastal bluffs, seasonally wet cliffs, rock outcrops	T/Str/G5S1	No	San Juan and nearby island
Few-flowered sedge (*Carex pauciflora*)	wet acidic environments, bogs	S/Sen/G5S2	No	Orcas Island
Nuttall's quillwort (*Isoetes nuttallii*)	seasonally wet ground and mud near vernal pools	S/Sen/G4S2	No	San Juan Island
Rush aster (*Symphyotrichum boreale*)	lakesides, marshes, bogs, and fens	T/Str/G5S1	No	Orcas Island
Sharp-fruited peppergrass (*Lepidium oxycarpum*)	salt spray zone, growing in moist cracks and vernal pools on bedrock	E/Str/G4S1	No	San Juan Island
Siskiyou Mountain ragwort (*Packera macounii*)	open woods and dry open places	T/Sen/G5S1	No	Orcas Island
White meconella (*Meconella oregana*)	open grassland where wet to moist in spring and dry by early summer	E/Sen/G2G3S1	No	San Juan Island

Sources: Bureau sensitive plants documentation source: GeoBOB and WNHP databases
Sen=BLM sensitive, Str=BLM strategic, S=State sensitive, T=State threatened, E=State endangered.
LT=federally listed as threatened.
*Habitat descriptions are from Camp and Gamon 2010 except for Rhoades 2009 for *Niebla cephalota* and Burke Herbarium 2016 for Siskiyou Mountain ragwort.
†From known populations on public lands, per Washington Natural Heritage Program.

Detailed trend information is not available for the slender crazyweed (*Oxytropis campestris* var *gracilis)*, California buttercup (*Ranunculus californicus* var *californicus*), bear's-foot sanicle, Niebla lichen, or

white-topped aster (*Sericocarpus rigidus*), or for the locally important plants (see subsection below), but all are subject to the trends described in the following paragraph.

In comparison to the conditions that existed prior to extensive Euro-American settlement, trends for many special status plants in Washington State have been downward as a result of conversion of natural habitats to development and altered communities. Exotic invasive species have spread into much of the remaining habitat, competing with native plants. Anticipated changes in temperature and precipitation patterns are also likely to affect special status species through alterations in competitive relationships, phenology, and fire frequency. In the San Juan Islands, species closest to the coastline, such as slender crazyweed, are threatened by rising sea levels and trampling by visitors walking the coastline. White-topped aster has the potential to be impacted by conifer encroachment, invasive species, and trampling from recreational uses.

Priority Ecological Communities

The WNHP has inventoried 15 ecological communities in the Monument (Table 24). Acres identified as part of these communities include both BLM-administered and non-BLM-administered lands. The WNHP inventoried the majority of these areas as part of a project to better understand the biodiversity importance of BLM-administered lands that were not currently in an ACEC (Crawford and Chappell 2006). Therefore, the WNHP did not study Iceberg Point and Watmough Bay, which are included in ACECs, in that effort. Many of the polygons developed were part mosaics in a forested community; therefore, there is some overlap between the communities. The fifteen communities identified by the WNHP are spread between nine types, eight of which are forested and one of which is grass-dominated.

The WDNR prioritized ecological communities for conservation in its 2018 Natural Heritage Plan (WDNR 2018). Some of the communities mapped in the Monument are not on the WNHP list of priorities. WNHP priority communities are described below. Definitions for the WNHP priorities can be found in the Habitat and Plants Issue 4 section of Appendix E.

Patos Island's community of western red cedar, grand fir, and swordfern is a WNHP identified priority 1 ecological community and was ranked as "A" quality, the highest ranking in the program. NatureServe describes this community as critically imperiled due to its restricted range and notes the lack of good quality occurrences because of logging and fragmentation. Patos Island also encompasses a Priority 2 community – Douglas-fir, western hemlock, and salal, a priority 3 community–Douglas-fir, salal, and oceanspray, and priority 1–Douglas-fir, grand fir, western red cedar, dwarf Oregon grape, and salal forest. In total, WNHP considers nearly all of the forested areas of Patos Island and Little Patos to have some conservation significance.

Chadwick Hill on Lopez Island has a high-quality (AB WNHP rank) example of a Douglas-fir, pacific madrone, and American vetch forest, as well as a high-quality Douglas-fir, salal, and oceanspray forest. Another forested community, shore pine with Douglas-fir and salal, is ranked BC, or good-fair integrity.

The North Pacific Herbaceous Bald and Bluff macrogroup at Lummi Rocks and Point Colville includes a red fescue – great camas – Oregon gumweed plant association rated by NatureServe as G1S1, which means it is critically imperiled both globally and in Washington State. The WNHP considers this community to be a priority 1 for conservation. This community also occurs at Iceberg Point, though the WNHP did not identify it, likely due to poor condition. Only ten occurrences of this grassland association are known in Washington with fair to good ecological integrity.

Iceberg Point also has a priority 1 ecological community, the Douglas-fir–(grand fir, western red-cedar)/ dwarf Oregon-grape – salal community is present on the north half of Iceberg Point. The condition of this forest community, as mapped in 1987, was 'BC' or good-fair integrity.

Carter Point, on the southern tip of Lummi Island, had several communities mapped of conservation importance. A priority 1, fair integrity forest of Douglas-fir, common snowberry, and oceanspray was found, as well as a priority 2, good integrity Douglas-fir, western hemlock, and salal forest. Lastly, the

WNHP also documented good integrity communities of Douglas-fir, salal, oceanspray and Douglas-fir, pacific madrone, American purple vetch.

President Channel, on the west side of Orcas Island, includes part of a WNHP identified fair to good integrity Douglas-fir, salal, oceanspray and Douglas-fir, Pacific madrone, American purple vetch community. This community spans the entire parcel.

Regional threats to these forested communities include residential development in scenic coastal areas, as well as logging, fragmentation, biological resource use such as legal floral and mushroom harvest, and exotic species. Threats to the grassland communities include native tree encroachment due to the absence of fire, non-native species invasions, and human intrusions and disturbances such as trail proliferation and reduction in vegetation cover (WNHP 2015).

The WNHP determines whether to include an ecosystem occurrence in their conservation system by combining the global and state status with the condition, or ecological integrity, of the ecosystem occurrence (Figure 6). Therefore, all occurrences of rare ecosystems become an "element occurrence" tracked by the WNHP; occurrences of lower status and lower integrity are not tracked by the WNHP.

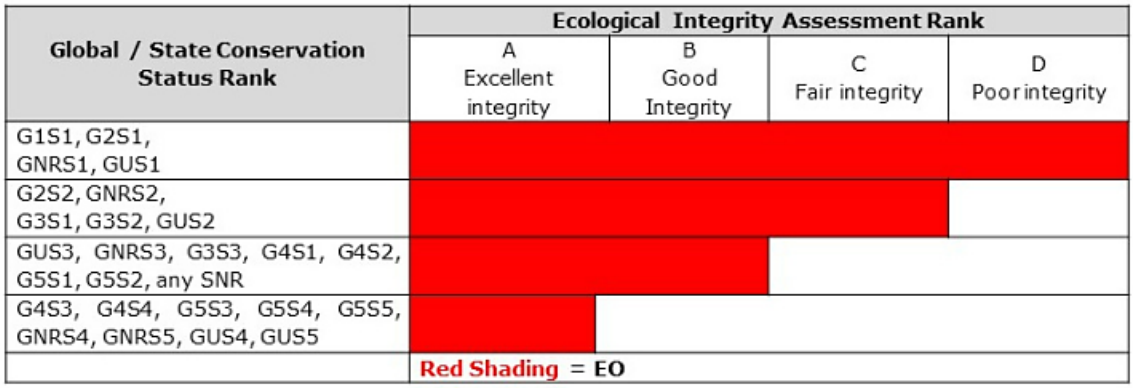


Figure 6: WNHP ecological integrity assessment rankings
Source: WDNR, Natural Heritage Program website: http://www.dnr.wa.gov/NHPecosystems

Table 24: Monument communities inventoried by Washington Natural Heritage Program

Community	Conservation Rank	Condition Rank	State Priority	Location Name	Acres	Survey Date	Recommendations/Notes (All recommendations/notes are from WNHP)
Douglas-fir – western hemlock / salal	G3S2	B	2	Carter Point	130*	2005	Mature (~125-year-old) and young forest with scattered old residuals. BLM land has never been logged.
Douglas-fir - pacific madrone / American purple vetch	G1G2QS1S2	B	2	Carter Point	65*	2005	Mature (~125-year-old) post-fire forest and woodland with frequent old-growth residual Douglas-fir. Char on bark of old trees. Canopy is dominated by mix of Douglas-fir and madrone. Significant portions of area may have been savanna, maintained by fire.
Douglas-fir / salal - oceanspray	G2G3S2	B	3	Carter Point	200*	2005	Mature (~125-year-old) and young forest with scattered old residuals. BLM land has never been logged.
Douglas-fir / common snowberry - oceanspray	G1S1	C	1	Carter Point	10*	2005	Mature (~125-year-old) forest with scattered old residuals. Canopy is dominated completely by Douglas-fir. Some *Acer glabrum* is in subcanopy. Understory of dense tall shrubs: *Holodiscus discolor* and *Symphoricarpos albus* are major species.
shore pine - Douglas-fir / salal	G1G2S1	BC	1	Chadwick Hill	30	1994	Mature (~115-year-old) post-fire lodgepole pine-dominated stands. Prescribed fire would be appropriate to regenerate PICO. In absence of fire, will probably succeed to PSME/GASH-HODI. Research Natural Area (RNA) quality.
Douglas-fir - pacific madrone / American purple vetch	G1G2QS1S2	AB	2	Chadwick Hill	65	1994	Decline of madrone could be a problem - widespread decline evident year of survey. Best known example, good condition, no past logging, extensive for this type. RNA quality.
Douglas-fir / salal - oceanspray	G2G3S2	AB	3	Chadwick Hill	130	1994	Mature (~110-130-year-old) Douglas-fir forest. Old-growth residuals with charred bark vary from absent to scattered to co-dominant. Keep trails to a minimum. RNA quality.
Douglas-fir - (grand fir, western red-cedar) / dwarf Oregon -grape - salal forest	G2S1	BC	1	Iceberg Point	~20	1987	
red fescue - great camas - Oregon gumweed	G1S1	B	1	Lummi Rocks	3	2005	Good- to fair-condition patches of largely native grass-dominated community. Occurs as patches in mosaic with substantial rock outcrops and—to lesser degree—shrublands.
Douglas-fir - western hemlock / salal	G3S2	B	2	Patos Island	70	2005	Old-growth forest. RNA quality.

Community	Conservation Rank	Condition Rank	State Priority	Location Name	Acres	Survey Date	Recommendations/Notes (All recommendations/notes are from WNHP)
Douglas-fir / salal - oceanspray	G2G3S2	C	3	Patos Island	4	2005	Mature (~125-year-old) Douglas-fir post-fire stand with scattered old trees. Some smaller *Arbutus* in subcanopy. RNA quality.
western red cedar - grand fir / swordfern	G1G2S1	A	1	Patos Island	85	2005	Old-growth and mature (~145-year-old) forest that has never been logged. Entire area appears to have burned since establishment of old-growth cohort, thought pockets in eastern third maybe not. Density of old trees that survived varies. RNA recommended. Best example of this type in the state.
Douglas-fir - (grand fir, western red-cedar) / dwarf Oregon -grape - salal forest	G2S1	BC	1	Patos Island	30	2005	Mix of mature stands with scattered old trees and old-growth stands. All burned prior to establishment of mature cohort. RNA quality.
red fescue - great camas - Oregon gumweed	G1S1	D	1	Point Colville		1997	Open rocky headland.
Douglas-fir - grand fir / common snowberry / Alaska oniongrass forest	G1S1	C	1	Point Colville		1994	Southern half of Pt Colville was formerly Douglas-fir savanna that has been invaded during this century with dense canopy of PSME and grand fir. Scattered old PSME with charred bark.
Douglas-fir – western red-cedar – grand fir / Oregon-grape – salal forest	G2S1	C	1	Point Colville		1994	Southern half of Pt Colville was formerly Douglas-fir savanna that has been invaded during this century with dense canopy of PSME and grand fir. Scattered old PSME with charred bark.
Douglas-fir - western hemlock / salal - oceanspray forest	G3S2	C	2	Point Colville		1994	Southern half of Pt Colville was formerly Douglas-fir savanna that has been invaded during this century with dense canopy of PSME and grand fir. Scattered old PSME with charred bark.
Douglas-fir - pacific madrone / American purple vetch	G1G2QS1S2	BC	2	President Channel	70*	1993	Deserves some level of protection. Multi-cohort Douglas-fir-Pacific madrone forest. Typical old Douglas-fir is about 285 years old, 30" at diameter breast height. Smallish canopy-level fir is 95-100 years old. Charcoal abundant on tree bark, especially older trees. Majority of area unlogged.

Source: WNHP dataset 2018

*Inventoried acres include both BLM-administered and non-BLM-administered lands. The BLM administers approximately 43 acres at Carter Point and 32 at President Channel.

Locally Significant Plants

Local stakeholders requested that the BLM address several plants of importance to San Juan Islands residents in this planning effort (Table 25). Many on the list do not meet the BLM or Washington State criteria for special status plants. Those that do are addressed under special status plant species, above.

Venus' looking glass (*Triodanis perfoliata*) is considered globally and nationally secure (not rare, NatureServe 2015), and is currently not ranked by the WNHP. Showy Jacob's ladder (*Polemonium pulcherrimum*) is considered globally secure and is not ranked nationally or by WNHP. Yampah (*Perideridia gairdneri*), or Indian carrot, is considered globally secure and is not ranked nationally or by WNHP. Harebell (*Campanula rotundifolia*) is considered globally secure and is not ranked nationally or by WNHP. Chick lupine (*Lupinus microcarpus*) is considered globally secure and is not ranked nationally or by WNHP. Brittle prickly pear (*Opuntia fragilis*) is considered globally, nationally, and state secure. Kinnikinnick (*Arctostaphylos uva-ursi*) is considered globally and nationally secure and is currently not ranked by WNHP. The BLM and WNHP do not track occurrences of the species referred to in this paragraph. Impacts to these plants of local importance would correspond with affects to the habitats and plant communities within which they live (see Habitat and Plants Issue 2, above).

Table 25: Plants of local concern within the San Juan Islands*

Species Name	Habitat	BLM Status
Sharp-fruit peppergrass (*Lepidium oxycarpum*)	Salt Spray Zone	Str
Nuttall's quillwort (*Isoetes nuttallii*)	Vernal pools	Sen
Venus' looking glass (*Triodanis perfoliata*)	Open rocky	none
Showy Jacob's ladder (*Polemonium pulcherrimum*)	Open rocky	none
Yampah (Indian carrot) (*Perideridia gairdneri*)	Open grassland	none
Hare bell (*Campanula rotundifolia*)	Open rocky	none
Chick lupine (*Lupinus microcarpus*)	Open grassland	none
Brittle prickly pear (*Opuntia fragilis*)	Open grassland	none
Kinnikinnick (*Arctostaphylos uva-ursi*)	Open grassland, understory	none

Sen=BLM sensitive, Str=BLM strategic

* This is an abbreviated version of a table provided to the BLM in 2015 by the Kwiaht Center for the Historical Ecology of the Salish Sea. This table is made up of species identified by Kwiaht as of local importance but which either A) do not have special designation or protection per the BLM Special Status Species Program, or B) are species with special designation that have not been documented within the Monument.

Effects of the Alternatives

The alternatives vary in how they would affect special status plants and priority communities. The effects of the alternatives on the extent and condition of plant communities are addressed in Habitat and Plants Issues 1 and 2, above.

Special Status Plants and Lichen

Suspected plants will not be discussed in the effects analysis individually because they have not been documented within the Monument. However, the BLM assumes that potential habitat for these species would improve or decline in accordance with their associated plant communities (see Table 23). For example, alternatives that expand and improve grassland and shrubland would improve potential habitat for suspected species associated with grassland and shrubland.

No Action Alternative

Under the No Action Alternative, as under Alternative A, the extent of Monument land in the grassland and shrubland class would decrease by approximately 13 percent and Monument land in the forest and woodland class would increase by approximately 2 percent over the next 20 years (see Table 7 on page 75). With limited vegetation treatments, the condition of communities in the grassland and shrubland

class would continue to decline due to encroachment by forest and shrub species and invasive plant species spread. Forest and woodlands would continue to have increasingly dense and closed conditions.

The continuation of current trends would cause a long-term decrease in the habitat for the five special status plants currently or historically occupying open grassland or grassy habitats on the Monument (see Table 22). The white-topped aster occurrence at Iceberg Point would become more shaded by encroaching conifers. Encroachment of conifers is also a habitat threat for bear's-foot sanicle (Camp and Gamon 2010). The continuing expansion of Douglas-fir under this alternative would increase habitat for the Niebla lichen.

Travel and transportation impacts (primarily hiking) would also continue to have minor negative long-term impacts to rare plants in the No Action Alternative. Specifically, the effects of trampling would presumably continue at Iceberg Point on the slender crazyweed and white-topped aster populations (see affected environment). However, impacts to both of these BLM sensitive species would not cause either to become federally listed.

Common to all Action Alternatives

Under all action alternatives, the BLM would implement management direction for the conservation and recovery of special status plants. The BLM would conduct pre-disturbance surveys prior to management actions that might disturb sensitive plants in areas where suitable habitat for such plants is suspected. Where sensitive plants are found, projects would be modified to avoid or reduce impacts. By implementing this direction, impacts to special status plants from disturbance related to management actions—including restoration efforts and invasive species removal—would be minimized and long-term effects to those resources would be positive.

During plan implementation, the BLM would install fencing as necessary to minimize trampling and herbivory of rare botanical resources. Long-term positive impacts to the size and vigor of special status plant populations could occur from these efforts.

Under all action alternatives, the BLM would remove encroaching conifers and non-native vegetation where the agency determines that they are negatively effecting nearby BLM special status plants. The BLM would replace plants removed with non-competitive native plants. Because many special status plants known or suspected in the Monument do not tolerate shade, this effort would benefit those special status plants that are known to occur in areas with active conifer encroachment. Conifer removal could have minor negative impacts on the quantity of available habitat for Niebla lichen, which grows on shaded branches of Douglas-fir in transitional woods. However, current records for the lichen and the documented special status plants do not occur adjacent to one another, so direct impacts to the Niebla lichen are not anticipated.

The BLM would also undertake implementation actions to install fencing and signs as necessary to minimize trampling and herbivory of rare botanical resources. These installations would both physically prevent visitor activities from damaging rare plants and would also educate visitors on the fragile nature of the plant communities. Long-term, positive impacts to the size and vigor of special status plant populations could occur from these efforts.

Alternative A

The changes to the extent of plant communities under Alternative A would be the same as under the No Action Alternative (see Table 7 on page 75).

As described under Habitat and Plants Issue 2, the prohibition on herbicide use under Alternative A would make it unlikely that the BLM would be as successful as under alternatives B, C, and D in controlling invasive plants without ground disturbance. Without chemical treatments, invasive plant removal would be undertaken using methods more likely to cause ground disturbance. In the short-term, this would result in less beneficial impacts to the known rare plant populations that occupy Monument grasslands and shrublands, as well as to potential habitat for golden paintbrush. However, these effects

would be minor due to the small number of acres the BLM anticipates it would treat in order to meet the alternative's objectives.

There would no longer be recreation impacts to special status plants under Alternative A. Long-term minor positive impacts would result for California buttercup, white-topped aster, and slender crazyweed, all of which experience some trampling from visitor traffic.

Under Alternative A, there could be some short-term negative impacts to special status plants and their habitats from naturally caused wildfires that are not suppressed, though naturally ignited wildfires are rare in the San Juan Islands (see Table 61 on page 238). This would be from the direct burning of the plants or habitat. However, overall habitat could improve through wildland fire, and long-term effects would be positive by adding more potential rare plant habitat.

Alternative B

Under Alternative B, the extent of Monument land in the grassland and shrubland class, which would include tree savanna, would increase by approximately 313 percent and the forest and woodland class would decrease by approximately 50 percent over the life of the plan (see Table 7). The extent of wetlands would increase by approximately 79 percent. Under this alternative, the BLM would undertake vegetation treatments to control invasive plant species and maximize native grassland species richness.

Through local seed collection and augmentation, the BLM would also work with partners to establish populations of rare botanical species native to the San Juan Islands. Introductions would include both those species historically occurring on the Monument as well as species with recovery plans calling for introduction into suitable habitat, such as golden paintbrush.

This alternative's vegetation approach would favor the expansion of habitat for white-topped aster, California buttercup, slender crazyweed, and bear's-foot sanicle, and would provide additional suitable habitat for golden paintbrush. It would also provide additional suitable habitat for rare plants native to the San Juan Islands, but not documented in the Monument, some of which would benefit from the expanded wetland habitat (see Table 23). Habitat for Niebla lichen would decline under this alternative due to the reduction of acreage in forest and woodland and the removal of encroaching Douglas-fir from grasslands.

Travel and transportation impacts would continue to have minor negative long-term impacts to California buttercup, slender crazyweed, and white-topped aster, though impacts would be reduced due to a requirement for visitors to remain on trails. However, impacts would not cause these species to become federally listed.

Potential future coordination between the BLM and partner agencies to remove invasive animals from the landscape under this alternative would provide long-term positive impacts to rare plants and their habitats by reducing excessive levels of herbivory. This would also allow for more successful survival of augmentations of new rare plant populations.

Alternative C

Under Alternative C, the extent of Monument land in the grassland and shrubland class, which would include tree savanna, would increase by approximately 287 percent and the forest and woodland class would decrease by approximately 48 percent over the life of the plan (see Table 7 on page 75). Under this alternative, the BLM would undertake vegetation treatments to approximate the conditions that would have existed when Native American/Indigenous Peoples used fire as a management tool by; this would involve creating more open forest conditions and removing non-native plants and encroaching forest species and woody shrubs from grasslands.

This alternative would favor the expansion of four of the five currently known rare plant species and would provide additional suitable habitat for golden paintbrush. Habitat for Niebla lichen would decline due to the reduction of acreage in the forest and woodland class and the removal of encroaching Douglas-fir from existing grasslands.

Travel and transportation impacts would continue to have minor negative long-term impacts to slender crazyweed and California buttercup, though impacts would be reduced due to a requirement for visitors to remain on trails. Impacts to these BLM sensitive species would not cause them to become federally listed. Under this alternative, the trail bisecting the white-topped aster population would be rerouted to eliminate trampling and allow the plant to fill in the old footprint. This would have a minor long-term positive impact on this BLM sensitive plant.

Potential future coordination between the BLM and partner agencies to remove invasive animals from the landscape under this alternative would provide long-term positive impacts to rare plants and their habitats by reducing excessive levels of herbivory. This would also allow for more successful survival of augmentations of new rare plant populations.

Sub-Alternative C

The effects of Sub-Alternative C on special status plant species would be similar to those in Alternative C. As described under Habitat and Plants Issue 2, without herbicides the BLM would be unlikely to be as successful as under alternatives B and C in controlling invasive plants and restoring native plant communities without extensive ground disturbance in grassland and shrubland. In the short-term, this would result in less beneficial impacts to rare plant populations that occupy Monument grasslands and shrublands, as well as to potential habitat for golden paintbrush. Effects on Niebla lichen would be the same as under Alternative C.

Alternative D

Under Alternative D, the BLM would maintain the current extent of Monument lands in the grassland and shrubland and forest and woodland classes. It would undertake treatments to ensure that invasive plants and encroaching forest species and woody shrubs do not further expand in grassland and shrubland.

Suitable habitats for the five currently known rare plant populations and the historically present golden paintbrush would remain approximately unchanged under Alternative D.

Travel and transportation impacts would continue to have minor negative long-term impacts to California buttercup, slender crazyweed, and white-topped aster; unlike under alternatives B and C, cross-country hiking would continue to be allowed under this alternative. Impacts to this BLM sensitive species would not cause them to become federally listed.

Potential future coordination between the BLM and partner agencies to remove invasive animals from the landscape under this alternative would provide long-term positive impacts to rare plants and their habitats by reducing excessive levels of herbivory. This would also allow for more successful survival of augmentations of new rare plant populations.

Priority Ecological Communities

The fifteen communities identified by the WNHP are spread between nine types, eight of which are forested and one of which is grass-dominated.

No Action Alternative and Alternative A

Under the No Action Alternative and Alternative A, the extent of Monument land in grassland and shrubland would decrease by approximately 13 percent and forest and woodland would increase by approximately 2 percent over the next 20 years (see Table 7 on page 75). A more rapid decrease in grasslands has been documented at Point Colville, where the WNHP has identified a red fescue, great camas, and Oregon gumweed community that is in poor condition (Dougherty 2004). The BLM assumes that the Monument would lose more of this priority 1 community under the No Action Alternative and Alternative A. The increase in the forest and woodland are not likely to occur in any of the later seral communities prioritized by WNHP.

Alternatives B and C

Under Alternative B, the extent of Monument land in the grassland and shrubland class, which includes tree savanna, would increase by approximately 313 percent and the forest and woodland class would decrease by approximately 50 percent over the life of the plan. Under Alternative C, the grassland and shrubland class, which would include tree savanna, would increase by approximately 287 percent and the forest and woodland class would decrease by approximately 48 percent over the life of the plan (see Table 7 on page 75).

Treatments to improve grassland and shrubland condition under both alternatives would likely improve the quality of existing red fescue, great camas, and Oregon gumweed communities at Point Colville and Lummi Rocks in the long-term. Iceberg Point also contains an herbaceous bald and bluff community that would benefit from these treatments. Short-term negative effects on native plants in the community may occur during restoration efforts, such as damage from digging or herbicide application; these effects would be minor.

Under alternatives B and C, the BLM would not convert G1S1 forest associations to other plant community types. Generally, the BLM would maintain some acres of uncommon forest associations identified in the Monument. Extent of non-G1S1 forest associations would decline.

By removing 50 percent and 58 percent of forests in the Monument respectively, alternatives B and C (including sub-C) would both have severe negative impacts where those conversions occur within priority ecological community areas. The locations of vegetation treatments would be determined during plan implementation. Part of the ranking system for priority communities takes into account the current conservation status. The WNHP assumed that the communities at Point Colville and Iceberg Point would not be altered due to the ACEC designation. Areas most vulnerable to impacts are Patos Island, Little Patos Island, Point Colville, Carter Point, Iceberg Point, and Chadwick Hill. Conversion of priority forests to grasslands and shrublands would mean complete loss of those systems in the conversion footprint. Alternatively, careful vegetative treatments in these identified priority forested areas, such as weed removal, could benefit these systems. Although these forested community types are considered by WNHP to be critically imperiled, the constituent species would remain present and common within the San Juan Islands, and would increase in density and structural diversity in all areas not treated.

Alternative D

Under Alternative D, the BLM would maintain the current extent of Monument land in the grassland and shrubland and forest and woodland classes. It would undertake treatments to ensure that invasive plants and encroaching forest species and woody shrubs do not further expand into grassland and shrubland. This would have a minor positive effect on existing priority ecological communities by removing invasive plants and improving quality.

Conclusion

Table 26 qualitatively summarizes the effects of the alternatives on priority ecological communities and habitat for special status plant species. It describes each alternative as causing an improvement, decline, or no change (+,-,=) to current conditions.

Alternatives B, C, and Sub-Alternative C would most improve the extent and condition of habitat for the four documented and one historically present special status species associated with the grassland and shrubland. Under these alternatives, there would be a decline in the extent of habitat for Niebla lichen. Similarly, improvements to the condition of grassland and shrublands at Lummi Rocks and Point Colville would subsequently benefit the priority ecological community identified there. Through the reduction in the extent of forested areas under these alternatives, there may also be a reduction in the extent of priority ecological communities on the Monument, depending on the location of site specific work.

The No Action Alternative and Alternative A would see a reduction of habitat acres and condition for the four documented and historically present special status species associated with the grassland and

shrubland vegetation class. There could be reduction in the extent of the priority ecological communities that occur in grassland and shrublands at Point Colville and Lummi Rocks. Under these alternatives, there would be an increase in the extent of habitat for Niebla lichen. There could also be an increase in forested areas adjacent to identified forest priority ecological communities. The extent and quality of the habitat for all special status plant species and priority ecological communities would remain static under Alternative D.

Table 26: Summary of effects of the alternatives on general habitat for special status plant species and priority ecological communities

	No Action Alternative	Alternative A	Alternative B	Alternative C and Sub-C	Alternative D
Grassland & Shrubland (golden paintbrush, slender crazyweed, white-topped aster, bear's-foot sanicle)	-	-	+	+	=
Forest & Woodland (Niebla lichen)	+	+	-	-	=
Non-forested WNHP priority ecological communities	-	-	+	+	=
Forested WNHP priority ecological communities	+	+	-	-	=

Cumulative Effects on Special Status Plants and Lichen

While detailed trends of the special status plant and lichen populations in the Monument are not known, the BLM assumes alternatives that favor associated habitat could contribute to an improvement in populations and alternatives that do not favor those habitats could contribute to a decline in species trend in the San Juan Islands. Effects of the alternatives to rare plant and lichen species are described in more detail above.

Due to the singular occurrence of populations of slender crazyweed, white-topped aster, and the two occurrences of Niebla lichen and bear's-foot sanicle, the BLM does not believe that any minor negative effects of this RMP would cumulatively cause any of these species to become federally listed. While the Monument's white-topped aster population is the only documented occurrence in the San Juan Islands, the species is well represented in the region, including on Vancouver Island, Fidalgo Island, and in Thurston County (WA). Slender crazyweed occurs on U.S. FWS islands near Iceberg Point, as well as several inland Washington counties, mainland British Columbia, and Idaho, Montana, and Wyoming. Bear's-foot sanicle occurs on several small islands in the San Juan archipelago, and along the coast of Washington, Oregon, and California. Niebla lichen occurs in several other areas in the archipelago including on National Park Service property. It is also found south of the Puget Sound in Washington, and along the west coast from Alaska to Mexico (Consortium of Pacific Northwest Herbaria accessed 2018).

Cumulative Effects on Priority Ecological Communities

While the plant communities, including WNHP priority ecological communities, in the Monument are described in Proclamation 8947 as "dramatic and unusual" in their diversity, they are also found in many other locations in the archipelago and on the main land.

The decrease in grasslands and shrublands under the No Action Alternative and Alternative A would contribute to the decline of the north Pacific herbaceous bald and bluff ecological systems, including the red fescue, camas, and Oregon gumweed communities, which has experienced a 30-50 percent short-term and 10-30 percent long-term decline in extent (WNHP 2015).

Alternative B and C, including Sub-Alternative C, would greatly improve the regional herbaceous bald and bluff trend mentioned above. However, if forest conversion to grasslands occurs where priority ecological systems occur, this would decrease the extent of forested priority ecological communities. Two priority 1 ecological systems, Douglas-fir (grand fir, western red-cedar) / dwarf Oregon-grape-salal forest and western redcedar-grand fir/swordfern, found on Patos and Iceberg Point have a long-term trend of 10-30 percent loss in the region. Douglas-fir, western hemlock, and salal forests, found on Carter Point and Patos, have experienced a 30-50 percent short-term and long-term decrease in acreage trend where found (WNHP 2015). Several of the WNHP identified priority forests found on Patos, Carter Point, and Chadwick Hill fall under the north pacific dry Douglas-fir madrone forest description, which is experiencing a 30-50 percent short-term and 70-80 percent long-term decline in extent in the region.

Habitat and Plants Analytical Issue 5: *How would the alternatives affect invasive plant species presence and spread within the Monument and the San Juan Islands?*

See Appendix B for analytical methods used in this analysis. See the Habitat and Plants Issue 5 section in Appendix E for background on noxious weeds, invasive plants, and control methods.

Affected Environment

Proclamation 8947 references invasive species as a threat to the Monument's fire-dependent grasslands. More broadly, invasive plants, and specifically noxious weeds, threaten Monument woodland, wetland, and small islands both directly, through competition with native plants, and indirectly, through disruption of ecosystem function.

The Washington State Noxious Weed Control Board identified 148 species on their 2017 list; 36 were listed as Class A (i.e., eradication is required). The San Juan County Noxious Weed Control Board identified 63 of these species in the county. In 2017, the county added butterfly bush (*Buddleja davidii*) with control or eradication required and changed old man's beard to control or eradicate. There are also nine unregulated plants of concern in the county. Inventories in 2010 and 2013 found 15 noxious weed species in the Monument with five of these in Class B and 10 in Class C (see Table 27). San Juan County requires control or containment of four of the Class B and two of the Class C weeds. Although neither the State nor the county can mandate control on Federal land, the BLM currently cooperates with the county in controlling the Class B and C weeds amenable to hand control methods.

Table 27: Washington State noxious weeds documented within the Monument, based on the 2017 State and County noxious weed lists

Species	Weed Class	Control or Containment required	Sites documented within the Monument (species may exist in additional locations)
shiny geranium (*Geranium lucidum)*	B	Yes	Posey Island
herb Robert (*Geranium robertianum)*	B	No	Posey Island, Broken Point Island
Scotch broom (*Cytisus scoparius)*	B	Yes	Blind Island (Blind Bay and East Sound)
spurge laurel (*Daphne laureola)*	B	Yes	Victim Island, Blind Island (East Sound), Twin Rocks
tansy ragwort (*Senecio jacobaea)*	B	Yes	Kellett Bluff, Patos Island, Parks Bay Island

Species	Weed Class	Control or Containment required	Sites documented within the Monument (species may exist in additional locations)
bull thistle (*Cirsium vulgare)*	C	No	Cattle Point, Point Colville, Watmough Bay, Iceberg Point, Posey Island, Victim Island, Blind Island (Blind Bay), Oak Island, Little Patos Island, Twin Rocks, Kanaka Bay Islands, Carter Point, Parks Bay Island, Reads Bay Island, Stuart Island, Chadwick Hill, McConnell Rocks, Richardson Rocks, Patos Island, Victim Island
Canada thistle (*Cirsium arvense)*	C	No	Watmough Bay, Kanaka Bay Islands
hairy cat's ear* *(Hypochaeris radicata)*	C	No	Iceberg Point, Lummi Rocks, Reeds Bay Island, Victim Island, Parks Bay Island, Posey Island
common groundsel (*Senecio vulgaris)*	C	No	
common St. Johnswort (*Hypericum perforatum)*	C	No	Carter Point
common tansy (*Tanacetum vulgare)*	C	Yes	
English ivy (*Hedera helix)*	C	Yes	Blind Island, Broken Point Island, Indian Island
evergreen blackberry (*Rubus laciniatus)*	C	No	
Himalayan blackberry (*Rubus armeniacus)*	C	No	Cattle Point, Watmough Bay, Posey Island, Blind Island, Broken Point Island, Eliza Island, Freeman Island, Indian Island, Oak Island, Patos Island, Skull Island, Twin Rocks
oxeye daisy (*Leucanthemum vulgare*)	C	No	Iceberg Point
reed canary grass (*Phalaris arundinacea)*	C	No	Watmough Marsh, Chadwick Marsh

* Hairy cat's ear in the USDA Plants database, common cat's ear on the State of Washington noxious weed list

Source: BLM 2013 Inventory

The Monument has a substantial population of invasive plant species that the State has not identified as noxious weeds. While invasive plants are found in nearly every vegetation type in the Monument, they are most common in open areas and dry forests (McNew 2014). The most common invasive grasses include soft brome (*Bromus hordeaceus*), common velvetgrass (*Holcus lanatus*), Kentucky bluegrass (*Poa pratensis*), orchardgrass (*Dactylis glomerata*), silver hairgrass (*Aira caryophyllea*), ripgut brome (*Bromus diandrus* ssp. *rigidus*), brome fescue (*Vulpia bromoides*), and colonial bentgrass (*Agrostis capillaris*). In addition to the noxious weeds hairy cat's ear, Canada thistle, and bull thistle, the most common invasive forbs include sheep sorrel (*Rumex acetosella*), garden vetch (*Vicia sativa*), tiny vetch (*Vicia hirsuta*), and narrowleaf plantain (*Plantago lanceolata*). English holly (*Ilex aquifolium*), an invasive tree, has been found in forests on Iceberg Point, Point Colville, Stuart Island, and Patos Island (McNew 2014). These other non-native invasive species would be a lower priority for control treatments.

Noxious weeds and non-native invasive plants (invasive plants), as well as opportunistic native plants, can alter the floristic structure and composition of communities and disrupt key ecosystem processes. At local scales, these species can displace desirable native plants, interfere with site recovery mechanisms, and result in permanent changes to ecological condition and function. The loss of desirable native plant diversity may lead to decline or loss of wildlife habitat and increase the risk of losing special status

species. Once established, these invasive species can cause substantial harm to environmental and economic values. Invasive plant populations not only affect the condition of Monument habitats, but can also spread to adjacent or nearby lands outside of the BLM's administration. For example, the San Juan County Noxious Weed Control Board is concerned that spurge laurel on the Monument's Victim Island could spread. Boaters visiting Posey Island could also easily spread shiny geranium to other islands. The Monument is also susceptible to the spread of invasive plant species from non-BLM administered lands.

Line-point data from herbaceous balds and bluff areas collected in 2014 indicate an average of 45 percent non-native cover (BLM 2014a). The Monument's grasslands are largely composed of non-native grasses and support a mixture of native and non-native forbs. Invasive grasses dominate the grasslands and shrublands, with invasive forbs common and invasive woody shrubs, such as blackberry, expanding into the grasslands and shrublands as well.

Mechanisms for introduction and dispersal of invasive plants include natural disturbances, animals, management activities, and public use. Vectors of spread include wind, water, vehicles, administrative and recreational equipment, wildlife, pets, livestock, and visitors and staff. Seeds and other propagules can be dispersed after becoming attached to feathers, fur, mud on equipment and vehicles, boats, and the clothing and footwear. Livestock and wildlife can disperse seeds that pass through digestive systems intact and viable as well as on fur, hair, and feathers.

Climate change increases the uncertainty over the effectiveness of invasive plant treatments. Some native plants may no longer be able to persist in their current ranges, creating additional opportunities for nonnative plants to invade. Increased global temperatures and altered patterns of precipitation and water storage will affect soil moisture and temperature regimes and soil biota, affecting which species can establish and persist and where. The physiological tolerances of some invasive plant species may be within the projected variation in climate and will in some instances be more suited to changed conditions (e.g., Molina-Montenegro and Naya 2012). Some of the current invasive plants may die out in response to changes in climate patterns, while previously non-invasive plants may become invasive (see the climate change section).

Approaches to addressing invasive plant species vary within the San Juan Islands. San Juan County prohibits the use of all pesticides on county rights-of-way. San Juan County has focused eradication and removal efforts on the Class A weeds milk thistle (*Silybum marianum*), garlic mustard (*Alliaria petiolata*), eggleaf spurge (*Euphorbia oblongata*), slenderflower thistle (*Carduus tenuiflorus*), and common cordgrass (*Spartina anglica*); and Class B and C weeds tansy ragwort, common teasel (*Dipsacus fullonum*), poison hemlock (*Conium maculatum*), meadow knapweed (*Centaurea* x *moncktonii*), perennial sowthistle (*Sonchus arvensis* ssp. *arvensis*), Scotch broom, and hoary cress (*Lepidum draba*) (SJCNWCB 2017). The National Park Service, the U.S. Fish and Wildlife Service, and Washington State Parks use an integrated pest management approach, which may include the use of herbicides. The BLM currently exclusively uses hand cutting in order to avoid intentional ground disturbance.

Effects of the Alternatives

The BLM does not know the rate of invasive plant spread in the San Juan Islands generally or the Monument specifically. The consensus among invasive plant ecologists and many managers is that, with few exceptions, well established invasive plants continue to spread at their full biological potential. However, that potential has never been quantified for any species and likely varies from species to species. Within the Monument, some populations, such as the invasive grasses at Cattle Point, may already fully occupy all available space while others, such as several species at Iceberg Point, continue to spread as disturbances create new potential growing sites.

This analysis rates the risk of continued spread or new introductions based on expected land management activities over the life of the plan and the area or miles of trail open for certain types of recreational uses. It also assumes that the effectiveness of invasive plant treatments depends on the number of acres planned for treatment, treatment options, and frequency of treatments. In general, the larger the number of acres

planned for treatment, the wider range of treatment options available, and the more frequent the treatments, the greater the probability of success. The effects of the action alternatives are rated relative to No Action Alternative, i.e., are the risks associated with invasive plant spread higher or lower than under current management. Because the BLM does not have specific information about invasive plant populations or treatments on private lands, no assessment of the risk of new invasions onto the Monument from adjoining lands is possible. However, the BLM can estimate the risk of spread from Monument lands onto adjoining lands, assuming the invasive plant(s) are not already present.

Common to All Alternatives, Including the No Action Alternative

Visitor use levels are expected to increase due to the combination of population growth generally and the desire to visit the Monument specifically. Visitors would inadvertently carry invasive plant seeds and propagules on clothing, pets, and vehicles into the Monument. These introductions may either spread existing invasive plants from one part of the Monument to another or from elsewhere on the San Juan Islands into the Monument. In addition, introductions of invasive species new to the San Juan Islands would be likely.

Gravity, wind, water, and wildlife are all effective vectors of nearly all invasive plant species. Since these vectors are beyond the control of the BLM, they would maintain a continued risk of the spread of invasive plant species within the Monument and between the Monument and adjoining lands. Introductions of new invasive species would likely come from humans.

No Action Alternative

Under this alternative, current custodial management would continue. Current management of invasive plants consists of cutting Himalayan blackberry, Scotch broom, sweetbriar rose (*Rosa rubiginosa*), Canada thistle, and bull thistle using hand tools and power tools (BLM 2014a). The BLM treats approximately 20 acres per year (this includes hazard tree removal).

Increased visitor use would increase the risks of user developed trails, erosion, trampling, and compaction, creating sites suitable for the establishment or spread of invasive plants (Masters and Sheley 2001). Cutting alone is usually ineffective at both reducing the invasive species and increasing native species (Dennehy et al. 2011, Kettenring and Adams 2011), particularly if done only once per year (Tarmi et al. 2011). Cutting alone can keep the invasive plants listed in OR 130-2014-CX-0001 from spreading by preventing seed dispersal, but only if cutting occurs before seed formation with no subsequent reflowering or if seedheads are collected and disposed of properly. Cutting alone would require repeated visits to cut resprouts and new germinants from soil stored seed, such as from Himalayan blackberry (Tirmenstein 1989), Canada thistle (Zouhar 2001), and Scotch broom (Zouhar 2005). Overall, under current management, invasive plants would continue to spread, the risk of new introductions would remain high, and the risk that invasive plants could spread from the Monument onto adjoining lands would remain high.

Alternative A

Under Alternative A, invasive plant management would consist of eradicating or controlling noxious weed species where control is required, and controlling other invasive plants when less than 50 percent of the native vegetation remains in a community type across the Monument. Control is required for shiny geranium, Scotch broom, spurge laurel, tansy ragwort, common tansy, and English ivy. Control measures would be limited to physical (manual and mechanical) methods and biological methods. The Monument would be closed to recreation use, while research, educational, cultural and spiritual activities would continue.

Closing the Monument to visitation would reduce the risk of invasive plant spread from most human activity, although some risk would remain from administrative and authorized activities. Of the noxious weeds where control is required, animals can spread spurge laurel, common tansy and English ivy (Gucker 2009, Waggy 2010, Washington State Noxious Weed Control Board No date), water can spread

Scotch broom and common tansy (Zouhar 2005, Gucker 2009), and wind can spread tansy ragwort and common tansy (King County Noxious Weed Control Program 2006, Jacobs 2009, King County Noxious Weed Control Program 2010). In addition, there are several other very invasive plants not classified as noxious weeds that would continue to spread through vegetative propagation and dispersal of seeds by explosive dehiscence, wind, water, and animals.

Waiting until less than 50 percent of the native vegetation remains means infestations would likely be large relative to parcel size. Control or eradication efforts are most successful when invasive plant populations are small and localized. Control efforts taken once infestations are large are typically very expensive, require several treatments over a single growing season and/or over several years, and can often fail (Davies and Sheley 2007 and references therein). Alternative A would likely fail to control invasive plant spread adequately, leading to further losses in plant diversity and potentially threatening the persistence of rare, sensitive, and culturally important plant species. Invasive plants would continue to pose a threat of spreading from the Monument to adjoining lands.

Alternatives B and C

Alternative B emphasizes increasing ecological resistance and resilience by increasing the extent of native vegetation and decreasing the extent of invasive plant species. All potential control measures would be allowed, with early detection and rapid response to new infestations emphasized. Alternative B would slightly reduce the acres open to recreation use (including recreational boat landings) relative to current conditions, but would increase the miles of trails. Permits would be required to access 167 acres and pets would be prohibited. In addition, active vegetation management through cutting and burning in forests and woodlands would likely create conditions suitable for the spread of invasive plants.

Alternative C emphasizes approximating vegetation conditions that would have occurred prior to Euro-American settlement by increasing the extent of grasslands and shrublands and controlling invasive plants. All control methods would be permitted, with early detection and rapid response to new infestations emphasized. The Monument would be open to recreation use generally with no permits required for access and the potential to construct additional visitor facilities. Leashed pets would be allowed. The area available for recreational use (including recreational boat landings) would be similar to that under Alternative B, but the miles of trails would be less than the current condition.

Since all forms of invasive plant management are available under both alternatives, the BLM could fully apply integrated plant management practices and ecologically-based invasive plant management principles. Larger infestations of invasive plants are more effectively treated using combinations of methods such as mechanical treatment or prescribed fire followed by herbicides, targeted grazing followed by mechanical treatment or herbicides, or other combinations of methods. Effective control of many invasive plants often requires combinations of methods (U.S. FWS 2009). The risks of new introductions and spread of invasive plants would be higher in Alternative B than C given increased hiking opportunities. The level of active vegetation management would be very similar between the two alternatives. Access to the full suite of treatment options increases the probability that the BLM can effectively control many invasive plants; protect rare, sensitive, and culturally important plants; and reduce the risks of invasive plants spreading from the Monument to adjoining lands. In addition, the BLM would be more likely to catch new infestations while small and more easily controlled (Davies and Sheley 2007).

Sub-Alternative C

Sub-Alternative C would have the same objectives as Alternative C, but the BLM would prohibit the use of herbicides to control invasive plants. To make up for the lack of herbicides, the frequency of manual and mechanical treatments would increase from an estimated five treatments to 20 treatments over the expected life of the plan. The acres and trails available for recreational use would be the same as under Alternative C.

The repeated mechanical treatments would be accompanied by frequent ground disturbance. Further, it is not clear that applying manual and mechanical treatments alone would effectively reduce certain invasive plants, particularly large infestations (Davies and Sheley 2007, U.S. FWS 2009). Uncertainty would increase over whether the BLM would could effectively control all new infestations and prevent invasive plants from spreading onto adjoining lands from the Monument. This alternative carries an increased risk that rare, sensitive, and culturally important plant species would also be harmed by the frequency of treatments (U.S. FWS 2009).

Alternative D

Alternative D would maintain the current extent, structure, and species composition of the different plant communities. Invasive plant management would emphasize early detection and rapid response to new infestations and eradication or control of the noxious weed species where control is required, but the BLM would not place a particular emphasis on reducing invasive plant species from current populations. The BLM would allow all methods of invasive species control. This alternative would have the greatest number of trail miles open to hiking.

Since the BLM would allow all methods of invasive species control, this alternative would likely lead to successful control of most noxious weed species, with the possible exception of large infestations. However, since attempting to maintain the status quo with invasive plants is rarely successful, the probability remains high that these species would continue to spread, posing continued threats to rare, sensitive, and culturally important plant species and higher risks of spread to adjoining lands. The number of available trail miles and the continued availability of off-trail hiking would increase the probability of additional spread and new introductions from hikers and their equipment and pets.

Conclusion

The No Action Alternative and alternatives A and D would likely prove ineffective at controlling the spread of invasive plants, although Alternative D would be more likely to successfully control noxious weed species where control is required. Sub-Alternative C would likely prove ineffective at controlling the spread of invasive plants generally, although control or eradication of new or small infestations of species would occur where control can be achieved without the use of herbicides. The high frequency of treatment would create the highest risk to rare, sensitive, and culturally important plants of all the alternatives. Alternatives B and C would have the highest probability of controlling the spread of invasive plants. Alternative C would have a slightly lower risk of new introductions and continued spread by visitors than Alternative B.

Table 28: Summary of impacts from alternatives to risks of invasive plant spread

		No Action Alternative	Alternative A	Alternative B	Alternative C	Sub-Alt C	Alternative D
Risk of Continued Spread	Noxious Weeds Requiring Control	High	High	Low-Mod	Low-Mod	High	Low-Mod
	All Other Noxious Weeds	High	High	Low-Mod	Low-Mod	High	High
	Other Invasive Plants	High	High	Low-Mod	Low-Mod	High	High
Effectiveness of Available Measures		Low*	Low	Mod-High	Mod-High	Low-Mod	Mod-High
Risks to Native Plants		High	High	Low-Mod	Low-Mod	High	High
Risks to Adjoining Properties		High	High	Low-Mod	Low-Mod	High	High
Spread by Visitors		High	High	Mod	Low-Mod	Low-Mod	High

*Assumes continuation of current management.

Cumulative effects of the alternatives on the presence and spread of invasive plants in the San Juan Islands

Regardless of alternative selected, the number of vectors and resident and visitor population growth would ensure that invasive plants remain problematic on the islands generally and within the Monument. Only small, localized populations of invasive plants can be eradicated, but detecting small populations of invasive plants remains difficult (Emry et al. 2011, AHWGISCC 2014). Since eradication is possible only for small, localized populations and since control is not the same as eradication, invasive plants are highly likely to remain present both within the Monument and the San Juan Islands. Invasive plants are also likely to continue moving between adjoining lands and the Monument due to a number of vectors that no entity can control.

Climate change brings additional uncertainty over time as it can affect the effectiveness of treatment regimens and how readily a site can be invaded by a particular species (AHWGISCC 2014). Changing climate can also increase an invasive species, decrease it, or cause a currently benign non-native species to become invasive (AHWGISCC 2014). While it is not possible to estimate which nonnative plants may increase, decrease, or become invasive, such changes are more likely to occur later in the expected life of the plan than earlier. In addition, some non-native plants may be more prone to rapid adaptation as a result of changing climate, particularly where introduced populations are very diverse genetically, indicating introductions from different parts of the invading species' native range (Henery et al. 2010, Colautti and Barrett 2013).

Habitat and Plants Analytical Issue 6: *How would use of chemical treatments (e.g., herbicides) affect non-target resources including vegetation, human health and safety, water quality, wildlife, and soils?*

Affected Environment

There are currently no chemical (e.g., herbicide) treatments occurring within the Monument.

Chemical treatments on public lands within the San Juan Islands are limited. In general, public land managers in San Juan County use herbicides to treat weeds in situations where alternative means of control would not be effective. The use of herbicides is currently prohibited on county road rights-of-way, but herbicides are applied in a limited amount to control weeds on other county properties (San Juan County Noxious Weed Board 2017). Chemical treatments are also part of the integrated pest management approach taken by the National Park Service, U.S. Fish and Wildlife Service, and Washington State Parks within the San Juan Islands (NPS 2008, U.S. FWS 2010, Washington State Parks 2000).

Effects of the Alternatives

The general impacts from herbicide use on human health and the environment are analyzed in the 2007 EIS and the 2016 EIS. This document tiers to both of these EISs and examples of impacts applicable for Monument lands are summarized and incorporated by reference below. These documents are available online at:

- Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Final Programmatic EIS (2007 EIS): eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=103592
- Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States Final Programmatic EIS (2016 EIS): eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=103601

Whenever applying herbicides, the BLM would also undertake the standard operating procedures and mitigation measures identified in the 2007 and 2016 EISs.

Appendix Q summarizes and contextualizes the potential for effects from herbicides described in the two vegetation treatment EISs.

Each of the 21 currently approved herbicides[42] listed in the 2007 EIS and 2016 EIS would be available for use within the Monument under the No Action Alternative and alternatives B, C, and D. The BLM would prohibit the use of herbicides under Alternative A and Sub-Alternative C. If the Approved RMP allows their use, specific herbicides chosen for future projects would be dependent on project-specific objectives and analysis.

The BLM estimated the extent of herbicide treatments that would be necessary to meet the objectives of each alternative over the life of the plan (see Habitat and Plants Issue 3). Dependent upon site-specific conditions and weed densities, the BLM estimates that under Alternative B it would treat an average of 128 acres annually, followed by an average of 192 acres under Alternative C, and an average of 23 acres under Alternative D. The BLM assumes that it would treat these same acreages multiple times over the life of the plan. If current trends continue, the BLM would not use herbicides under the No Action Alternative. They would be prohibited under Alternative A and Sub-Alternative C.

Cumulative Effects of the Alternatives on Impacts from Herbicides on Non-Target Resources in the San Juan Islands

As stated in the affected environment section above, herbicide use in the San Juan Islands is limited. However, other agencies and organizations, such as the National Park Service, State Parks, the Nature Conservancy, County Land Bank, and U.S. Fish and Wildlife Service, as well as private landowners have used and currently use herbicide to treat vegetation. The BLM expects that herbicide use on these lands will continue over the next 20 years.

The BLM does not expect cumulative effects from herbicides under the No Action, Alternative A, or Sub-Alternative C because it would prohibit herbicide use in the Monument. Conversely, the beneficial impacts from treating non-native and invasive vegetation with herbicides described in sections above under alternatives B, C, and D would not occur under these alternatives either individually or cumulatively when considering past, present, and reasonably foreseeable herbicide use on non-BLM-administered lands.

Under alternatives B, C, and D, cumulative effects on non-target resources would be similar. These effects would occur over the largest amount of acres under Alternative C (average 192 acres treated annually), followed by Alternative B (average 128 acres annually), and on the least amount of acres under Alternative D (average 23 acres annually). Considering the limited amount of acreage estimated for treatment in the Monument under these alternatives, the BLM's herbicide use would not add substantially to the overall use of herbicides across the San Juan Islands. Moreover, the BLM's potential use of herbicide under these alternatives would be similar to that of other agencies and organizations on the islands in that it would be considered as an additional tool for vegetation management where deemed appropriate based on site conditions and the species requiring treatment.

Lands and Realty

Key Points

- The designating proclamation prohibits the BLM from disposing of any Monument land except by exchanges that further the protective purposes of Proclamation 8947.

[42] 2,4-D, bromacil, chlorsulfuron, clopyralid, dicamba, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, triclopyr, imazapic, diquat, diflufenzopyr (in formulation with dicamba), fluridone. aminopyralid, fluroxypyr, and rimsulfuron

- Rights-of-way for the Coast Guard to access aids-to-navigation would be unaffected by the range of alternatives around rights-of-way avoidance or exclusion areas.

This section contains two analytical issues:

1. How would the alternatives affect the availability of Monument lands for rights-of-way? (Page 138)
2. How would the alternatives affect the BLM's ability to engage in land exchanges that further the protective purposes of Proclamation 8947? (Page 140)

Lands and Realty Analytical Issue 1: *How would the alternatives affect the availability of Monument lands for rights-of-way?*

See Appendix B for analytical methods used in this analysis. The Lands and Realty Issue 1 section of Appendix E provides background on rights-of-way including the definition of rights-of-way avoidance and exclusion areas.

Affected Environment

Proclamation 8947 designating the San Juan Islands National Monument provides that "nothing in this proclamation shall be deemed to limit the authority of the Secretary of Homeland Security to engage in search and rescue operations, or to use Patos Island Light Station, Turn Point Light Station, or other aids to navigation for navigational or national security purposes." One implication of this language is the necessity of maintaining existing, and potentially authorizing new, right-of-way authorizations to the Coast Guard, which is under the Department of Homeland Security, to operate and maintain aid to navigation equipment and associated facilities within and adjacent to the Monument.

The 1990 ACEC decisions prohibit rights-of-way in these areas for additional roads, power lines, pipelines, or communication facilities. Outside of the ACECs, the BLM considers rights-of-way in the Monument on a case-by-case basis. There are no recorded applications for rights-of-way on Monument lands beyond the Coast Guard rights-of-way described below.

There are currently five active rights-of-way within the Monument issued to the Coast Guard for road and utility access to lighthouse related structures and equipment. Two of the right-of-way reservations include visibility and noise protective areas and authorization to enforce these protective measures. The BLM is currently researching whether other rights-of-way may occur on lands it acquired from private ownership on Lopez Island in the 1990s. Decisions made through this planning effort would not affect existing rights-of-way.

The visibility protective areas apply to land formerly withdrawn to the Coast Guard at Cattle Point and at Turn Point. This provision allows Coast Guard to limit the height of structures and prune and remove vegetation to prevent interference with unobstructed visibility at these facilities. The right-of-way at Cattle Point also includes a protective provision prohibiting human habitation and the construction of dwellings to minimize effects to the sound pressure levels of the fog signal. Any proposed action by the BLM that has the potential to interfere with visibility (at Cattle Point and Turn Point) or sound pressure levels (at Cattle Point) would need to be reviewed by the Coast Guard to assure the protective area is not adversely impacted.

Table 29: Current known rights-of-way in the Monument*

BLM Case File Serial Number	Location and Purpose for the Right-of-Way	Issued/Expiration Date
WAORE 0 016851	Cattle Point – Access Rd & Restrictive Interference	1965 / Perpetual
WAORE 0 018465	Iceberg Point – Access Road	1968 / Perpetual
WAOR 36694	Turn Point –Access Rd & Restrictive Interference	1984 / Perpetual
WAOR 38385	Patos Island – Walkway & Landing Dock	1985 / Perpetual
WAOR 67814	Cattle Point – Temporary Access Road to Lighthouse	2016 / 2019

* The BLM is currently researching whether other rights-of-way may occur on lands it acquired from private ownership on Lopez Island in the 1990s.

Effects of the Alternatives

No Action Alternative

Under the No Action Alternative, the BLM would continue to generally consider new requests for rights-of-way on a case-by-case basis. Except for rights-of-way for additional roads, power lines, pipelines, or communication facilities in areas covered under the 1990 ACEC decisions, the BLM could continue to allow rights-of-way it determines to be consistent with the protection and restoration of the Monument's objects and values. If current trends in applications continue, the number of rights-of-way would remain static or increase only minimally.

Alternative A

Under Alternative A, the BLM would continue to consider new requests for rights-of-way on a case-by-case basis. The BLM could allow rights-of-way it determines to be consistent with the protection and restoration of the Monument's objects and values. If current trends in applications continue, the number of rights-of-way would remain static or increase only minimally.

Alternatives B and D

Under alternatives B and D, the BLM would designate the Monument as a right-of-way avoidance area. The BLM could grant rights-of-way that do not degrade Monument objects and values, in addition to those requested by the Coast Guard as necessary for the use and maintenance of aids to navigation for navigational or national security purposes.

As specified under alternatives B and D, the BLM would not consider rights-of-way for wind and solar energy projects or communications towers, as, given the small size of Monument parcels, these types of projects would be very likely to negatively impact Monument objects and values. This clear prohibition would save time and energy for those considering submitted applications for rights-of-ways for these uses.

Alternative C

Under Alternative C, the BLM would designate the Monument as a right-of-way exclusion area, with an exception for rights-of-way to the Coast Guard as necessary for the use and maintenance of aids to navigation for navigational or national security purposes. In the event that an individual or entity does submit an application for a right-of-way over Monument land, the BLM would not consider this request unless it meets the exception described above. If current trends in applications continue, this restriction would have a minimal effect on potential right-of-way inquirers. The number of rights-of-way within the Monument would remain static or increase only minimally through requests from the Coast Guard.

Conclusion

Rights-of-way for Coast Guard aids-to-navigation access would be unaffected by the alternatives.

Assuming limited demand for rights-of-way continues into the future, the effects on new rights-of-ways would be minimal under all alternatives. To the extent that rights-of-way are sought in the future, Alternative A would have the least effect on these requests, though the Monument Manager would still only issue a right-of-way where he or she determines that it is consistent with Proclamation 8947. Alternative B would have the greatest potential impact on new rights-of-way, by prohibiting them except to the Coast Guard as necessary for the use and maintenance of aids to navigation for navigational or national security purposes.

Lands and Realty Analytical Issue 2: *How would the alternatives affect the BLM's ability to engage in land exchanges that further the protective purposes of Proclamation 8947?*

See Appendix B for analytical methods used in this analysis. The Lands and Realty Issue 2 section of Appendix E provides background on land tenure zones.

Affected Environment

Since no RMP currently covers these lands, there are no land tenure zones within the Monument. Proclamation 8947 prohibits any disposal of Monument lands except by exchanges that further the protective purposes of the proclamation.

Effects of the Alternatives

The alternatives differ in how the BLM would apply land tenure zones to the Monument. Land tenure zones would affect the BLM's ability to engage in land exchanges that would further the protective purposes of the proclamation (e.g., by consolidating sensitive habitat). The alternatives have no effect on the BLM's ability to acquire new lands through donation or purchase.

No Action Alternative

Under the No Action Alternative, there would continue to be no RMP decisions on land tenure. The BLM would continue to only consider land disposal through exchanges that further the proclamation's protective purposes. Exchanges would require additional planning and analysis.

Alternative A

Under Alternative A, the BLM would designate the whole of the Monument as land tenure zone 1 (i.e., all lands would be retained). This would ensure that all Monument lands would remain under BLM administration and continue to be managed consistent with the proclamation. It would preclude the BLM from undertaking exchanges that would further the protective purposes of the proclamation.

Alternative B, C, and D

Under alternatives B, C, and D, the BLM would designate Monument lands acquired using Land and Water Conservation Funds (currently, Watmough Bay, Chadwick Hill, and parts of Iceberg Point) as land tenure zone 1. This would ensure that these lands remain under BLM administration to be managed consistent with the proclamation and the purposes for which they were acquired. All other Monument lands would be land tenure zone 2 (i.e., retain unless exchanged to further the proclamation's protective purposes). Any exchange of Monument land would require additional planning and analysis.

Conclusion

The BLM would continue to have the ability to engage in exchanges that further the protective purposes of the Monument under the No Action Alternative and for the majority of the Monument under alternatives B, C, and D. The BLM would not have the ability to engage in such exchanges under Alternative A.

Paleontological Resources

Key Points

- There is one documented paleontological resource locality in the Monument.
- Alternative C and Sub-Alternative C would have the greatest potential for disturbance to paleontological resources from vegetation treatments.
- The No Action Alternative and alternatives B and D would have the greatest potential for disturbance to paleontological resources from recreation.

This section contains one analytical issue:

1. How would the alternatives affect paleontological resources within the Monument? (Page 141)

Paleontological Resources Analytical Issue 1: *How would the alternatives affect paleontological resources in the Monument?*

See Appendix B for analytical methods used in this analysis. See the Paleontological section of Appendix E for general background on paleontological resources.

Affected Environment

Proclamation 8947 refers to fossils that have been discovered throughout the San Juan Islands. One paleontological resource locality has been documented within the Monument. The locality, which currently appears to be in stable condition, includes remains of *Serpula vermicularis*, a calcareous tube worm, fan worm, or plume worm, often found in marine inter-tidal zones.

While this is the only documented paleontological resource locality in the Monument, the Monument includes exposures of rock formations and groups in which fossils have been found in the surrounding area. Given that paleontological resources occur throughout the San Juan Islands additional paleontological resource localities likely occur within the Monument. Paleontological resources in exposures of the Nanaimo Group of rock from the Upper Cretaceous (100.5 to around 66 million years ago) have been found on Vancouver Island and Gulf Islands of Canada as well as in the San Juan Islands. Common paleontological resources from the shallow marine rocks found in the Cedar District Formation, a member of the Nanaimo Group, include ammonites, baculitids, bivalves, and other fossil remains.

The first dinosaur fossil discovered in Washington State was found in rock from the Cedar District Formation in the San Juan Islands. The fossilized bone is one of the northernmost discoveries of theropod dinosaurs on the Pacific Coast (Peecook and Sidor 2015). In addition, paleontological remains of various plants and animals and their trackways occur within the Chuckanut Formation, a sedimentary unit that formed during the Eocene Epoch (54 to around 42 million years ago). Chuckanut and related geologic formations occur in western Washington including the San Juan Islands and British Columbia. Pleistocene (2.6 million years ago to around 11,700 years ago) age remains of extinct animals have also been identified in the San Juan Islands. Bones of the extinct species of bison (*Bison antiquus*), found on Orcas Island, appear to have been utilized by early inhabitants of the area near the end of the last Ice Age.

Paleontological resource localities are nonrenewable resources. Natural processes including erosion, weathering, soil conditions, and animal activity can expose and adversely affect these resources, as can human activities, whether intentional or inadvertent. Recreational use of the area has increased over the last decade, increasing the possibility of finding paleontological resources but also increasing the risk of unauthorized collection or vandalism in areas where paleontological resources are exposed. Actions that result in excavations, research studies, or other measures that require survey and inventory for paleontological resources would contribute information to the scientific record.

Effects of the Alternatives

The alternatives vary in their impact to paleontological resources. Management actions most likely to affect paleontological resources include those associated with shoreline stabilization, vegetation treatments, and recreation. The BLM can reduce effects to paleontological resources through systematic and thorough inventories.

The integrity of paleontological resources can be assessed by the condition of the paleontological resource and its relationship with its stratigraphic context (e.g., the geological layer in which it is found). Disturbance can obscure the association between the paleontological resource and its place of geologic origin making it difficult to accurately identify or classify the species of individual specimens and the age of the fossil-bearing deposits. Actions that alter, degrade, or otherwise affect the integrity and condition of a paleontological resource or locality have a high potential to impact their value as a resource for science, education, and recreation.

Long-term adverse impacts to paleontological resources could include the damage, destruction, or complete loss of scientifically important paleontological resources. The greater the extent and depth of ground disturbing activities, the greater the potential for impacts to paleontological resources, particularly where the subsurface potential for fossil bearing sediments cannot be determined prior to the ground disturbance. Increased visitor access to sensitive paleontological resources and localities can lead to unauthorized collection, inadvertent damage, or vandalism.

Impacts to paleontological resources exposed by natural erosion, particularly along the shorelines, can be exacerbated by surface disturbing activities. Such activities can lead to the discovery of fossils and fossil bearing rock formations. These activities can also lead to permanent damage or destruction of paleontological resources or to increased vulnerability to unauthorized collection. Measures to control ground disturbance, erosion, and loss of ground cover could reduce damage to or destruction of paleontological resources located on or near the ground surface.

Under all alternatives, the BLM would identify paleontological resources through review of the Potential for Fossil Yield Classification (where available) and inventory prior to authorizing projects that could impact paleontological resources, such as campsite development, trail building, tree removal, and digging or pulling to remove invasive plants. The Potential Fossil Yield Classification system provides an estimate of the potential that important paleontological resources will be found and is used to assess possible resource impacts and management needs.

Where important paleontological resources are identified, the BLM would modify projects to avoid or reduce impacts. Despite these precautions, recreation activities and vegetation treatments create the potential for disturbance and loss of paleontological resources. Where important scientifically important paleontological resources could not be avoided, the BLM would develop mitigations to address adverse impacts. Actions that include paleontological resources survey, inventory, and research studies would contribute information to the scientific record.

Under all alternatives, the BLM would address potential impacts to paleontological resources through project design during implementation-level planning and NEPA compliance and Paleontological Resources Preservation Act review. The BLM would work with partners to avoid, minimize, or mitigate potential impacts and identify, evaluate, protect, stabilize, and repair scientifically important paleontological resources.

Impacts from Shoreline Stabilization

Shoreline stabilization measures would reduce or limit erosion from large storm events. Storms and associated tidal surges can modify spatial relationships of paleontological resources to their stratigraphic context and alter or destroy the physical characteristics of the paleontological resources themselves. This can make it difficult or impossible to accurately classify the species of individual specimens, or identify the age of the fossil-bearing deposits or better understand the paleo-environment from which the paleontological resource originated. Measures to stabilize shorelines could preserve the integrity of fossil deposits and prevent further damage or loss of opportunities for studying and learning about past environments.

Where shoreline erosion threatens important paleontological resources, the BLM, in consultation with university and other scientific and community partners, would consider shoreline stabilization to protect these resources. It is not possible to predict the number or location of these projects. Impacts to paleontological resources from the range of alternatives for shoreline stabilization are summarized in the paleontological resources conclusion below.

Impacts from Recreation

Recreational use and access can impact paleontological resources through direct disturbance, soil compaction, altered surface water drainage, erosion, and access leading to unauthorized collection or vandalism. These effects can result in a loss of specimen integrity and scientific information and public

education potential. Surface-disturbing activities could directly impact any undiscovered paleontological resources by exposing or damaging buried material. This could result in inadvertent destruction or loss of scientific and educational values, including potential illicit collecting of newly exposed materials.

Impacts from recreation on paleontological resources would be substantively the same as those described. In general, increases in acres open to camping and trail miles open to hiking, equestrian, or bicycling access would increase risk of exposure or damage to undocumented paleontological resources. Impacts to paleontological resources from the range of alternatives for recreation are summarized in the conclusion below.

Roads and trails would not cross documented paleontological resource localities under any alternative. Under the No Action Alternative and alternatives B and C, the documented paleontological resource locality would continue to be within 164 feet[43] of 0.02 miles of trail. Under Alternative A these 0.02 miles of trail would be closed to recreational use and would likely return to a natural state over time. Under alternative D, there would be 0.08 miles of trail within 164 feet of the documented resource. The known locality would be in an RMA under alternatives B, C, and D. The area would be closed to camping under all alternatives.

Impacts from Vegetative Treatments

Vegetation management can include mechanical, biological, chemical treatment and prescribed fire. The treatment measures that the BLM would allow during plan implementation vary by alternative. While the BLM would identify paleontological resources prior to authorizing surface disturbing projects, vegetation treatments that include surface disturbance such as hand pulling, digging, surface scarring, or tree removal could directly impact undiscovered paleontological resources and human remains by exposing buried fossil material. Prescribed fire could impact paleontological resources through staining or spalling (i.e., chipping) of fossils from high temperature fires. Chemical herbicidal applications would have limited impacts to paleontological resources.

Impacts to paleontological resources from the range of alternatives for vegetation management are summarized in the paleontological resources conclusion below.

Conclusion for Paleontological Resources

The alternatives would vary in their effects on paleontological resources within the Monument. Specifically, they would vary in terms of available stabilization tools and the potential for short-term and long-term effects from disturbance related to recreation and vegetation management.

Stabilization of localities threatened by erosion and storm surges would likely be most effective under Alternative B and the No Action Alternative where the full range of shoreline stabilization measures would be available to protect paleontological resources in the Monument. Under alternatives A and C, and under Alternative D in areas with wilderness characteristics (232 acres), the BLM would not allow hard shoreline stabilization. Because soft stabilization measures are less effective than hardening in certain situations, the BLM assumes that some additional paleontological resources would be damaged, altered, or lost under alternatives that do not allow hard shoreline stabilization in some or all of the Monument.

As described above, the BLM would use the Potential for Fossil Yield Classification and inventory prior to authorizing projects that can impact paleontological resources. Where important paleontological resources are identified, the BLM would modify the project to avoid, reduce, or mitigate impacts.

Under the No Action Alternative and Alternative D, potential impacts from camping, off-trail hiking, and extensive trail use would occur, but there would be limited potential for disturbance of paleontological resources due to vegetation management. As a result, the No Action Alternative and Alternative D would

[43] Generally, 164 feet is the minimum distance the BLM uses for buffers to avoid potential impacts to a paleontological resource.

both have an intermediate potential for disturbance to paleontological sites however, increases in designated camping, opening previously closed areas to camping, and increasing trail miles by approximately 50 percent would increase potential risks under Alternative D. Alternative C and Sub-Alternative C would have the greatest potential of any alternative for disturbance to paleontological resources from vegetation treatments, but more limited potential for disturbance from trail use and camping. Because of this mix of high potential for disturbance from vegetation treatments and a moderate potential for disturbance from recreation activities, these alternatives would have a higher potential for disturbance compared to the No Action Alternative and alternatives A, B, and D.

Under Alternative A, the BLM would prohibit recreation in the Monument and undertake a very limited approach to vegetation management. Alternative A would produce the least potential for human caused damage, alteration, or loss of paleontological resources though some paleontological resources could be damaged or lost where soft shoreline stabilization measures are ineffective. In addition, there would be fewer opportunities for public education and enrichment about paleontological resources, though opportunities for scientific research would continue. This alternative would have the lowest potential of any alternative for disturbance to paleontological resources from the recreation activities and vegetation management.

Under Alternative B, the BLM would undertake more extensive vegetation treatments than would occur under the No Action Alternative and alternatives A and D, though they would be less extensive than under Alternative C and Sub-Alternative C. Under this alternative, more than half of the Monument would be open to dispersed camping by permit and trail miles would increase by 27 percent. Because of the relatively high potential for disturbance from both recreation and vegetation management, the BLM believes this alternative would have a high potential for disturbance to paleontological resources. However, a full range of shoreline stabilization measures under this alternative would reduce potential impacts to paleontological resources.

Under Alternative C, the BLM would undertake more extensive vegetation treatments than under the No Action Alternative and alternatives A, B, and D, though they would be less extensive than under Sub-Alternative C. Extensive vegetation treatments would contribute to adverse impacts to paleontological resources if the BLM does not effectively identify and avoid these resources prior to treatments. Potential impacts from recreation would be moderate under this alternative and it would be more likely reduce impacts from recreation to paleontological resources more than any alternative other than A. As under Alternative A, the BLM would prohibit hard shoreline stabilization. Measures to reduce long-term adverse impacts would occur where stabilization measures are ineffective for controlling erosion leading to damage or loss of important paleontological resources.

Under Sub-Alternative C, the BLM would undertake more extensive vegetation treatments than would occur under the other alternatives. Without the use of herbicides, the BLM would likely need to increase the repetition of mechanical treatments to meet the vegetation objectives, which would contribute additional short-term and long-term negative impacts related to ground disturbance. Risk for impacts to paleontological resources from recreation would be the same as Alternative C but when combined with the risk from vegetation management, this alternative would have the greatest potential risk to paleontological resources.

Under Alternative D, the BLM would maintain the approximate extent and condition of plant communities in the Monument as of 2016. The BLM would increase trail miles by approximately 50 percent and most of the Monument would be open to camping. The BLM would allow hard shoreline stabilization except in areas with wilderness characteristics. Considering all factors, under Alternative D, there would be greater potential risk to paleontological resources than under the No Action Alternative and Alternative A, similarly risk as Alternative B, and less risk than under Alternative C and Sub-Alternative C.

Cumulative effects of alternatives on paleontological resources in the San Juan Islands

The Monument's contribution to the fossil record in the San Juan Islands is relatively small given that only one paleontological resource locality has been recorded in the Monument. Fossil bearing geologic formations from the Upper Cretaceous, Eocene, Pleistocene and other time periods have been documented in the San Juan Islands. A number of the formations likely occur within the Monument and could include additional paleontological resources. The majority of the documented paleontological resources are outside of the Monument.

Natural erosion and human development have impacted numerous fossil bearing formations in the San Juan Islands. San Juan County has the lowest shoreline modification level in the Puget Sound region, with around 5 percent of its shorelines modified (Herrera 2011, Friends of the San Juans 2011). Even with limited shoreline modification, development and some degree of shoreline simplification have altered the nearshore environment of all the major islands. Most Monument shorelines are relatively unaltered pocket beaches, feeder bluffs, and rocky headlands.

While less altered than outside shorelines, developments have taken place on lands now included in the Monument. Developments constructed before BLM administration include lighthouses and associated aids to navigation facilities, recreation sites, and roads and trails, some of which receive ongoing maintenance and care. Filling and development occurred historically in and near the wetland at Watmough Bay and agricultural development occurred near Chadwick Hill and at Iceberg Point. Many of these developments have potentially obscured, damaged, altered, or destroyed paleontological resources.

Reasonably foreseeable actions that would affect coastlines within the San Juan Islands over the next 20 years include the rerouting of the road to Agate Beach on Lopez Island and the construction of docks and other small scale coastline developments within the San Juan Islands. The alternatives would differ in the extent to which they would contribute to the protection or disturbance of paleontological sites within the San Juan Islands.

Because development and shoreline erosion is likely to continue, paleontological resources in the San Juan Islands will continue to be threatened, damaged, or lost. The overall number of paleontological resources in the San Juan Islands (documented and undocumented) will likely decline over time. While the total number of scientifically important paleontological resources is likely to decline, the number of documented localities are likely to increase through inventories and unintentional discoveries.

The alternatives would differ in their effect on the Monument's contribution to the total number of scientifically important paleontological resources and localities in the San Juan Islands. As described in the conclusion (above), they would differ both because of the tools available to protect paleontological resources and because of the magnitude of the potential for these resources to be disturbed or lost due to recreational activities and vegetation management. Under all alternatives, there would be some potential for disruption or loss of important paleontological resources due to shoreline erosion and storm surge, visitor use, and vegetation management.

Considering all factors, the Monument's contribution to paleontological sites in the San Juan Islands would be most likely to decline under Sub-Alternative C, followed by alternatives C, B, D, and the No Action Alternative. Alternative A would have the lowest likelihood that the Monument's contribution to paleontological sites in the San Juan Islands would decline over the life of the plan.

Recreation and Visitor Services

Key Points

- Because the Monument encompasses only 4 percent of the area's public lands the alternatives would have a limited effect on recreational opportunities in the San Juan Islands as a whole,

- Because the Monument encompasses 53 percent of the public land on Lopez Island, the alternatives would have a substantial effect on the recreational opportunities available to its residents and visitors.
- While the Monument encompasses only a small percent of the public land in the San Juan Islands, the BLM's recreation decisions can affect the demand for recreational opportunities on non-Monument lands and on the management effectiveness of nearby land managers.

Note: this section addresses impacts to travel within the Monument, since the great majority of travel is associated with recreation.

This section contains three analytical issues:

1. How would the alternatives' approaches to recreation and transportation affect recreational opportunities? How would the alternatives affect acres and trails open to potentially conflicting recreational uses and vegetation treatments that would disrupt recreational opportunities? (Page 146)
2. How would the BLM's designation of recreation opportunity spectrum classes across the alternatives affect recreation settings in the Monument? (Page 183)
3. How would the alternatives indirectly affect the management of human use activities on nearby non-BLM-administered lands in the San Juan Islands? (Page 187)

Background

When developing plans, the BLM designates areas that it intends to manage to support recreational opportunities as recreation management areas (RMAs). It identifies visitor activities, experiences, and benefits and allowed and prohibited uses to support those objectives. See Appendix O for RMA frameworks that lay out the alternative's range of recreation objectives and use decisions for each RMA. For further background information on the BLM's approach to recreation management see Appendix E.

Recreation and Visitor Services Analytical Issue 1: *How would the alternatives' approaches to recreation and transportation affect recreational opportunities? How would the alternatives affect acres and trails open to potentially conflicting recreational uses and vegetation treatments that would disrupt recreational opportunities?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Proclamation 8947 does not identify recreation as an object or value for which the Monument was designated. Recreation is, however, a primary means by which the public can interact with and learn to appreciate the Monument's ecological and cultural objects and values. Recreation also has the potential to degrade the values that attract visitors to the area.

In the absence of a law, regulation, or supplementary rule, BLM-administered lands are generally open to recreational uses unless closed through a land use plan decision. See the No Action Alternative on page 8 for an overview of current restrictions. For example, visitors may currently land boats on all Monument rocks and islands, but must not violate Federal, State, or local laws that protect marine mammals and migratory birds (e.g., the Marine Mammal Protection Act and the Migratory Bird Treaty Act).

The exceptional maritime environment of the San Juan Islands provides outstanding and diverse recreational opportunities. Recreation is vital to the San Juan Island's economy and plays an important role in the culture of the local communities. Visitors to the San Juan Islands predominately arrive via some type of watercraft, usually either by the Washington State Ferry, private or charter boat, or smaller crafts such as canoes and kayaks. Visitors also arrive by private aircraft and smaller commercial aircraft. About 900,000 visitors utilized the Washington State Ferry system to reach the San Juan Islands in 2009 (Compilation of San Juan Visitors Bureau Surveys, 2005−2009; San Juan Visitors Bureau 2010).

Although it encompasses only a small percentage of the public land in the San Juan Islands (see Table

30), the Monument is an important recreational resource for both local residents and visitors. In 2014, the Monument had over 100,000 visitors. The BLM estimates these visits through an array of methods, including trail counters, volunteer monitors, partner monitoring, assessment of impacts in remote areas compared to areas with known visitation numbers, and BLM staff reporting. The difficulty of monitoring use at some of the Monument's more remote rocks and islands means that this is probably an underestimate of current usage. The great majority of this visitation takes place between May 15 and September 15. The shoulder seasons for visitor use are typically March 15 to May 14 and September 16 to October 15. The off-season occurs between October 16 and March 14. In fair weather conditions, visitors can enjoy most of the Monument's recreational opportunities during the shoulder and off seasons.

Visitors currently engage in a variety of activities in the Monument, including hiking, kayaking, camping, photography, lighthouse appreciation, volunteer events, hunting, and wildflower and marine mammal viewing. Fishing is a popular activity in the San Juan Islands, but this use is currently very limited in the Monument. Almost half of visitors access the Monument via boat.

Developed and semi-developed recreation areas (e.g., sites with kiosks, toilets etc.) are scattered throughout the Monument, with most occurring at Patos Island, Blind and Posey Islands, Turn Point Light Station, and on the south end of Lopez Island. The BLM and its partners maintain and monitor these sites for recreation uses and benefits. See Table E-4 in the Recreation and Visitor Services Issue 1 section of Appendix E for information about recreational opportunities and facilities at prominent Monument sites. Recreation also occurs outside of these prominent areas; visitors may seek out these more remote sites due to their primitive nature and opportunities for solitude.

In addition to providing traditional recreational opportunities, the lands on the south end of Lopez Island are also culturally important to members of the local community, as expressed in an array of feedback received by the BLM during the scoping period for this planning process. Residents expressed a sense of spiritual connection to these lands and described using them for celebrations, coming of age ceremonies, memorials, and visits of a contemplative nature (BLM 2015b,c).

The following subsections offer an overview of recreational opportunities currently available in the Monument. In order to provide context for the BLM's contribution to the broader availability of recreational opportunities, each section also provides an overview of opportunities on non-Monument lands in the San Juan Islands. Recreational opportunities are described in association with each ferry served island and with areas only accessible by personal watercraft.

General Recreational Opportunities[44]

All 1,021 acres of Monument land are currently open to recreation (including recreational boat landing). The Monument encompasses 4 percent of the nearly 24,000 acres of land open to public recreational use in the San Juan Islands. As laid out in Table 30, Monument land encompasses 5 percent or less of the publically accessible land associated with each ferry-served islands, with the exception of Lopez Island. The Monument encompasses more than 50 percent of publically accessible land on Lopez Island.

Table 30: Publically accessible lands in the San Juan Islands

	Monument land (acres)	Land open to public recreation in the San Juan Islands (acres)	Percent of land open to public recreation in the Monument
San Juan Island*	23	6,442	<1%
Orcas Island*	42	7,501	1%
Lopez Island*	508	964	53%
Shaw Island*	5	522	1%
Lummi Island*	50	944	5%

[44]The BLM and other public land managers that allow the public to use lands under their jurisdiction for outdoor recreation are not liable for unintentional injuries to such users (RCW 4.24.210).

	Monument land (acres)	Land open to public recreation in the San Juan Islands (acres)	Percent of land open to public recreation in the Monument
Non-ferry Served Islands and Rocks	393	7,508	5%
Total	**1,021**	**23,882**	4%

Source: BLM inventory data and personal communication between Nick Teague and non-BLM land managers in the San Juan Islands.

* Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island acreage includes Indian Island)

The Monument currently has no formally designated trail network. Most existing trails are user created. Proclamation 8947 states, "except for emergency, Federal law enforcement, or authorized administrative purposes, motorized vehicle use in the Monument shall be permitted only on designated roads, and non-motorized mechanized vehicle use in the Monument shall be permitted only on designated roads and trails." Thus, motorized vehicle use is currently restricted to roads and mechanized vehicle use (e.g., bicycle) is currently restricted to roads and trails.

Appendix H: Draft Comprehensive Travel and Transportation Plan includes maps and site-specific information about roads and trails identified through the inventory.

In 2015, the BLM worked with a local contractor to complete an inventory of all roads and trails in the Monument (inventory was initiated in 2012). The BLM added a small number of trail segments that were missing from the inventory during the preparation of this Draft RMP/EIS. The Monument currently has 14.9 miles of mostly user created trails. An additional 1.2 miles of user created trails occur on adjacent Coast Guard lands at Cattle Point and Iceberg Point[45].

While many receive regular use, these trails are generally primitive and unmarked. The trail surface is typically natural soil, though 0.4 miles are concrete, 0.3 miles are gravel, and less than 0.1 miles are wood. Most of these trails (13.4 miles including Coast Guard) are single track, with an average width of 18 to 24 inches. Approximately 2.6 miles are double track, which are typically no wider than 48 inches but can be as wide as 72 inches or greater (i.e., older roadbeds).

The BLM also administers a total of 1 mile of road at Point Colville, Turn Point, and Watmough Bay. The public routinely uses these roads to access the Monument. Landowners also use the road segment that crosses Point Colville to access private land. A small segment of the road at Turn Point (approximately 0.1 miles) is currently used only for administrative access.

From the early 1990s through 2009, the BLM documented 6-8 miles of trails within what is now the Monument. The current inventory documents approximately twice that mileage of trails. The current inventory is more comprehensive than past efforts, which may account for some of this increase. There has also been an increase in user created trail miles in the more accessible Monument lands. As described below, recreation in the Monument has increased substantially over the past two decades (see Table 37).

Specific Recreational opportunities[46]

Recreational Boating

[45] The BLM provides on the ground management support for these adjacent Coast Guard lands. While the BLM does not have decision-making authority over these lands, it will provide recommendations regarding the trail network to the Coast Guard based on this analysis.

[46] The BLM and other public land managers that allow the public to use lands under their jurisdiction for outdoor recreation are not liable for unintentional injuries to such users (RCW 4.24.210).

Monument: While the designation extends only to mean high tide, recreational boating is a popular way to experience the Monument. In some cases, recreational boaters also access the Monument by landing on its shoreline. Currently, all 21.1 miles of Monument shoreline are technically open to recreational boat landing; the frequency with which this takes place varies substantially depending on the accessibility of the landing and the remoteness of the area. Safe landing would be difficult or impossible on some portions of the shoreline. BLM staff observations indicate that most boats that land on the Monument are non-motorized.

San Juan Islands: Recreational boating—including sailing, motor boating, and paddling—is a popular activity in the San Juan Islands for both visitors and residents. A 2009 study estimated that 25,000 kayaking visitors travel annually to San Juan Island alone (San Juan County Economic Development Council 2009). The National Park Service, Washington State Parks, WDNR, WDFW, San Juan Preservation Trust, and San Juan County all manage shoreline that is open to at least some types of recreational boat landing. The majority of shoreline in the San Juan Islands is in private ownership (San Juan County 2016a). In a recent survey, San Juan County residents identified shoreline access as a key priority (San Juan County 2016a).

Hiking[47]

Monument: Hiking is a popular recreational activity in the Monument; there are approximately 14.9 miles of undesignated, mostly user created trails. There are an additional 1.2 miles of on adjacent lands under Coast Guard jurisdiction at Cattle Point and Iceberg Point[48] that an interconnected part of the trail network. While there is no current prohibition against hiking cross-country, most visitors stay on trails.

Most trails in the Monument and on adjacent Coast Guard lands are single track (13.4 miles). The other 2.6 miles are double track, allowing visitors to walk side by side. Hiking also takes place on the Monument's 1 mile of roads (at Point Colville, Turn Point, and Watmough Bay). The majority of hiking in the Monument takes place at relatively easily accessible lands on Lopez Island and San Juan Island.

San Juan Islands: Hiking is a popular recreational activity across the San Juan Islands; there are an estimated 198 miles of publically accessible hiking trails available on both ferry served islands and non-ferry served islands. The trail network varies substantially between ferry-served islands, with Orcas and San Juan islands having substantially larger trail systems than Lopez, Lummi, and Shaw islands. Trails range from single track to double track and include both user created and professionally designed and constructed trails. Many are multi-use trails open to a variety of non-motorized uses. Individual trails may be closed to certain activities during specific dates and times.

Table 31 displays the miles of trails available for hiking on publically accessible lands on both ferry served islands and non-ferry served islands.

Table 31: Hiking opportunities in the San Juan Islands

	Monument Trails Used for Hiking (trail miles)	Total Hiking Trails (trail miles)
San Juan Island	1.2 **Locations:** Cattle Point	65
Orcas Island	0.8 **Locations:** Freeman, Indian, Oak, Skull, Victim islands*	53
Lopez Island	9.7	14

[47] For the purposes of this document, "Hiking" encompasses all forms of pedestrian recreational travel, including, but not limited to, walking for pleasure and exercise and trail running.

[48] The BLM provides on the ground management support for these adjacent Coast Guard lands. While the BLM does not have decision-making authority over these lands, it will provide recommendations regarding the trail network to the Coast Guard based on this analysis.

	Locations: Cape Saint Mary, Chadwick Hill, Iceberg Point, Lopez Pass, Point Colville, and Watmough Bay	
Shaw Island	0.4 **Locations:** Blind and Broken Point islands*	3
Lummi Island	0.1 **Locations:** Carter Point and Lummi Rocks*	6
Non-ferry Served Islands	3.9 **Areas known to have trails:** Eliza, Kellett Bluff, McConnell Rocks, Patos, Posey, Reads Bay, Turn Point	55 **Islands known to have trails:** Decatur, Vendovi, James, Clark, Doe, Jones, Turn, Matia, Henry, Waldron, Cypress, Stuart

Source: BLM inventory data and personal communication between Nick Teague and non-BLM land managers in the San Juan Islands.
*These islands are near enough to the ferry served island to provide visitor and resident opportunities.

Equestrian Use

Monument: Limited horseback riding currently takes place in the Monument. This activity has historically taken place on approximately 1 mile of lower elevation trails at Chadwick Hill and Watmough Bay. This majority of this trail mileage is 18 inches wide and made of natural soils. Equestrian use also occurs on the gravel trail from the parking area to Watmough Bay.

San Juan Islands: In the San Juan Islands, horseback riding predominately takes place on private lands. However, there are an estimated 35 miles of publically accessible equestrian trails on ferry served islands. The great majority (88 percent) are on San Juan Island and Orcas Island. Trails range from single track to double track and include both user created and professionally designed and constructed trails. Many are multi-use trails open to a variety of non-motorized uses. Individual trails may be closed to certain activities during specific dates and times. Horseback riding also takes place on roads in the San Juan Islands.

Table 32 displays the miles of trails for equestrian use on publically accessible lands on both ferry served islands and non-ferry served islands.

Table 32: Equestrian opportunities in the San Juan Islands

	Monument Trails Regularly Used for Equestrian Access * (trail miles)	Total Equestrian Trails (trail miles)
San Juan Island	0	18
Orcas Island	0	12
Lopez Island	1 **Location:** Chadwick Hill, Watmough Bay	4
Shaw Island	0	0
Lummi Island	0	0
Non-ferry Served Islands	0	0

Source: BLM inventory data and personal communication between Nick Teague and non-BLM land managers in the San Juan Islands.
*All trails in the Monument are currently open to all non-motorized uses.

Bicycle Use

Monument: Currently, members of the public are not regularly using any trails within the Monument for bicycling, though trails within the Monument are open to all non-motorized uses. Proclamation 8947 prohibits mechanized vehicle use (e.g., bicycles) off roads and trails.

San Juan Islands: Bicycling is a popular recreational activity in the San Juan Islands; there are an estimated 58.6 miles of publically accessible bicycling trails. The great majority (92 percent) are on San Juan Island and Orcas Island. These trails range from single track to double track and include both user created and professionally designed and constructed trails. Many are multi-use trails open to a variety of non-motorized uses. Individual trails may be closed to certain activities during specific dates and times. Bicycling also takes place on roads in the San Juan Islands.

Table 33 displays the available miles of trails for bicycling on publically accessible lands on both ferry served islands and non-ferry served islands.

Table 33: Bicycling trails in the San Juan Islands

	Monument Trails Regularly Used for Bicycling* (trail miles)(trail miles)	Total Bicycling Trails (trail miles)
San Juan Island	0	20
Orcas Island	0	34
Lopez Island	0	4.6
Shaw Island	0	0
Lummi Island	0	0
Non-ferry Served Islands	0	0

Source: BLM inventory data and personal communication between Nick Teague and non-BLM land managers in the San Juan Islands.
*All trails in the Monument are currently open to all non-motorized uses.

Motorized Recreation/Access

Monument: In the Monument, motorized access is limited to the 1 mile of existing roads at Point Colville, Watmough Bay, and Turn Point. Public use of these roads is primarily to access the Monument for recreational use. Land owners also use the road at Point Colville to access private land. Given the short distances of Monument roads, they do not provide an opportunity for scenic driving as an activity.

Visitors to Point Colville and Watmough Bay on Lopez Island typically arrive by automobile and park at the trailheads. The BLM-administered sections of road at Point Colville and Watmough Bay are 0.4 miles and 0.1 miles respectively. The BLM is currently undertaking a survey process to determine whether a portion of the road to the Watmough Bay parking lot crosses private land; any decisions made through this planning effort would apply only the portion of the road crossing BLM-administered land.

Visitors to Turn Point on Stuart Island, which is not served by the Washington State Ferry, typically arrive by hiking from the public boat landing. Occasionally visitors arrive by automobile or, more rarely, by all-terrain vehicle. A county road transitions to 0.5 miles of graveled BLM road to provide access to the Turn Point Light Station. Approximately 0.1 miles of this road is currently used only for administrative access.

San Juan Islands: In the San Juan Islands, visitors and residents travel by automobile on paved and unpaved county roads and by motorized watercraft. Scenic driving is a popular activity. There are no public lands in the San Juan Islands that provide trail-based motorized recreational opportunities. Trail-based motorized activities take place only on private lands.

Camping

Monument: Camping is a popular activity in three Monument locations: Patos, Blind, and Posey islands (see Table 34). The BLM cooperatively manages these areas with Washington State Parks through a memorandum of understanding.

Occasional dispersed camping (i.e., no campsite and limited or no facilities) also takes place. With the exception of areas included in the ACECs (Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay), the Monument is currently open to this use. The ACECs are currently closed to camping.

Table 34: Designated site camping opportunities in the Monument

Site Name	Level of Development	Campsites	Reservation System
Patos Island	Low*	7	No
Blind Island	Low*	4	No
Posey Island	Low*	2	Yes

*These camping areas all have composting or vault toilets, fire-rings, and picnic tables. None of them have electricity or fresh water.

San Juan Islands: Camping is a popular activity in the San Juan Islands; there are an estimated 419 public campsites available throughout the islands. These campsites range from primitive with no fresh water available to more developed areas with potable water, flushing toilets, and shelters with electricity. There is also camping available on private lands with a wide variety of amenities and fees. Outside of the Monument there are currently no dispersed camping opportunities on public lands in the San Juan Islands.

Table 35 displays public campsites available on both ferry served islands and non-ferry served islands.

Table 35: Designated site camping opportunities in the San Juan Islands

	Designated Campsites in the Monument (number of campsites)	Total Designated Campsites (number of campsites)
San Juan Island	0	30 **Locations:** San Juan County Park, Griffin Bay Campground (DNR)
Orcas Island	0	156 **Locations:** Moran State Park, Obstruction Pass State Park, Point Doughty Natural Resources Conservation Area (DNR)
Lopez Island	0	77 **Locations:** Odlin County Park, Spencer Spit State Park
Shaw Island	4 **Locations:** Blind Island*	17 **Locations:** Blind Island (Monument), Shaw County Park
Lummi Island	0	5 **Locations:** Lummi Island Natural Resources Conservation Area (DNR)
Non-ferry Served Islands	9 **Locations:** Patos and Posey islands	182 **Locations:** Clark Island Marine State Park, Cypress Island Natural Resources Conservation Area (DNR), Doe Island Marine State Park, James Island Marine State Park, Jones Island Marine State Park, Patos and Posey islands (Monument), Matia Island (U.S. FWS), Stuart Island State Park, Sucia Island Marine State Park, Turn Island (U.S. FWS)

Source: BLM inventory data and personal communication between Nick Teague and non-BLM land managers in the San Juan Islands.

*This island is near enough to Shaw Island to provide visitor and resident opportunities.

Hunting Using Firearms

Note: Based on public comments, the BLM has included firearms prohibitions in some Alternative C and Sub-Alternative C (see page 174). These prohibitions would affect hunting using firearms, but would not affect other forms of hunting (e.g., bow hunting). The prohibitions would also not affect hunting by Coast Salish tribal members.

Hunting with rifles is prohibited in San Juan County. Legal firearms for hunting in San Juan County are center fired pistols and shotguns, which reduce the overall distance a projectile can travel as compared to

a rifle. By law, anyone born after 1972 is required to take and pass a hunter safety course. Hunters using a firearm, though not bow hunters, are required to wear "safety orange." Members of Tribes with off-reservation hunting rights are not subject to State requirements regarding hunting.

Monument: The BLM is aware of hunting occurring on approximately 590 acres of Monument land. The BLM and partners have observed hunting (with or without firearms) on Lopez Island at the contiguous Chadwick Hill, Point Colville, and Watmough Bay area and at Iceberg Point. Hunting has also occasionally been observed at Cattle Point (San Juan Island) and Turn Point (Stuart Island). Residents of Lopez Island have raised safety concerns about conflicts between hunting using firearms and hiking and volunteer activities (BLM 2015b,c, BLM 2016a,b). The BLM has also received comments from members of the public and partner agencies asking that hunting opportunities be maintained (BLM 2016a,b). The Monument is one of two areas of public land where hunting is allowed on Lopez Island.

Based on informal conversations between hunters and BLM staff and volunteers, most hunters in the Monument are from off-island and live in the nearby region. Firearms used for hunting in the Monument have traditionally been shotguns, though muzzleloaders have been used in recent years. Bow hunters also use Monument lands (a decision prohibit firearm discharge in a particular area would not affect bow hunting). Hunting for deer is the primary activity, though there have been rare instances of waterfowl hunting at Chadwick Marsh. Chadwick Marsh is the only publically accessible area for waterfowl hunting on Lopez Island.

DOI Secretarial Order 3356 calls for National Monument land use plans to "include or expand hunting, recreational shooting, and fishing opportunities to the extent practicable under the law." Currently, the whole Monument is open to the discharge of firearms except developed recreation sites (e.g., campgrounds and picnic areas with facilities) as provided in current supplementary rules that apply to all BLM-administered lands in Oregon and Washington (see Appendix I).

The BLM is not aware of any use of firearms within the Monument for recreational target shooting or any other non-hunting activity.

San Juan Islands: In the San Juan Islands as a whole, hunting on publically accessible lands is extremely limited (see Table 36). However, the majority of Cypress Island (approximately 5,000 acres), which is managed by WDNR, is open for hunting; small sections of the island are closed to this activity. Hunting on private lands occurs with written permission from the landowner.

Table 36 displays the publically available acres open to hunting for both ferry served islands and non-ferry served islands.

Table 36: Hunting opportunities in the San Juan Islands*

	Known Hunting in the Monument (acres)	Total Public Land Open to Hunting (acres)
San Juan Island	23 **Locations:** Cattle Point	23 **Locations:** Cattle Point
Orcas Island	0	**Acres:** 148 **Location:** Killebrew Lake (WDFW)
Lopez Island	503 **Locations:** Chadwick Hill, Iceberg Point, and Point Colville, Watmough Bay	907 **Locations:** Monument lands and Lopez Hill (San Juan County Land Bank). Lopez Hill is only open during ½ of the regular deer hunting season.
Shaw Island	0	0
Lummi Island	0	0
Non-ferry Served Islands	86 **Locations:** Turn Point	5,186 **Locations:** Cypress Island (DNR), Turn Point (Monument)

Source: BLM inventory data and personal communication between Nick Teague and non-BLM land managers in the San Juan Islands.

*All 1,021 acres of the Monument are currently open to hunting; this table provides acres in the Monument where hunting currently takes place. Many of the Monument's small rocks and islands would provide very limited hunting opportunities.

Solitude and Quiet

Monument: While the BLM does not currently explicitly manage any Monument lands for solitude and quiet (i.e., opportunities for visitors to have no or minimal interaction with other visitors or disturbance from non-natural noise), opportunities for these experiences exist throughout the area. The availability of such opportunities are dependent on several factors, including the presence of overhead small planes and jets and nearby motorized boats, vehicles, and people. The BLM has no jurisdiction over sources of disturbance outside of the lands it administers (e.g., boats in the water or overhead planes and jets).

The impact of these factors varies substantially depending on the accessibility of the area and the time of year or day. Visitors can most easily find experiences of quiet and solitude at locations only accessible via personal watercraft. Monument lands on ferry served islands, which are easily accessed by roads, typically offer these opportunities only on certain days and times. Even during the busiest time of year for visitation, individuals can find solitude and quiet on more accessible Monument lands during the early morning and later afternoon and evening. Opportunities for solitude and quiet increase during the shoulder seasons. In the off season opportunities for solitude and quiet can frequently be found.

San Juan Islands: The San Juan Islands offer opportunities to experience solitude and quiet in the natural world. As with the Monument lands, these experiences are affected by factors including noise and visual disturbance from overhead small planes and jets and nearby motorized boats, vehicles, and people. The effect of these influences vary substantially depending on the time of year or day.

The San Juan Islands receive an estimated 750,000 to 1 million visitors each year (San Juan Islands Scenic Byway: June 2012). Many arrive during the high-use season. Due to the relative remoteness of much of the archipelago, solitude and quiet can be found at certain times and locations even during high-use periods. The off-season is optimal for experiences of solitude and quiet. Easily accessible areas typically offer fewer opportunities for solitude and quiet compared to more remote rocks and islands.

A 2016 survey conducted by San Juan County found that 77 percent of residents felt that County-owned parks, trails, and natural areas are not at all or only slightly crowded. Residents of Lopez and Shaw islands expressed a slightly greater concern about crowding (San Juan County 2016a). A 2017 survey found that more than half of visitors to Watmough Bay described some degree of crowding, while nearly half of visitors at Iceberg Point and 10 percent of visitors at Cattle Point described some degree of crowding (Confluence Research and Consulting 2018). The 2017 survey took place between late May through Labor Day, which is the high visitation period (Confluence Research and Consulting 2018).

Commercial, Competitive, and Organized Group Recreation Uses

While most visitors to the Monument recreate individually or in small groups, others participate in organized events such as weddings or commercial recreation such as sea kayaking tours. The BLM requires that organized groups of ten or more individuals obtain permits to visit the lands included in the ACECs at the south end of Lopez (BLM 1990). Permits are also required for organized (without a defined group size threshold outside of ACECs), commercial, and competitive group activities at all locations in the Monument. On average, the BLM currently issues approximately 1-2 permits each year. Most are area or activity specific permits, such as for weddings.

For the past 20 years, the BLM's Spokane District Office has been concerned about unpermitted commercial uses. The BLM believes that some outfitters—primarily sea kayaking guides and charter boat operators— use the Monument without obtaining the appropriate authorization. The BLM has made

an effort bring unauthorized activities into compliance; however, the relative isolation of some Monument lands and the limited staff and law enforcement presence has made enforcement and monitoring difficult.

Other Recreational and Human Use Activities

The primary, current recreational uses of the Monument are described above, as are those about which members of the public have expressed an interest. The BLM is aware that other recreational uses take place in the Monument occasionally or have taken place historically. These include, use of metal detectors, use of recreational drones, lighting of fireworks, geocaching, and gathering of natural materials by members of the public. The 1990 ACEC decisions require members of the public to obtain permits to collect vegetation (permits have rarely, if ever, been requested). Rock climbing has historically taken place at Watmough Bay, but this use has not been observed in the past several years.

Trends in Recreation

Overall trends show a substantial increase in visitor use at prominent sites in the Monument (see Table 37), though improved data collection has also caused the overall visitation numbers to increase. At Watmough Bay, for example, 5,000 visitors were reported in 2002 and over 17,000 visitors were reported in 2003. It is likely that this increase was influenced by changes in visitation estimate methods rather than an actual dramatic change in visitation.

San Juan County's population is growing at a modest pace and the fastest-growing age group is 50 and older (San Juan County 2016). A 2016 survey of residents found that this demographic participates in relatively low-impact outdoor recreation such as hiking, walking, wildlife watching, and relaxing in nature (San Juan County 2016). This survey also found that 87 percent of respondents value parks, trails, and natural areas as critical to their quality of life. This survey found that 90 percent of respondents participating in hiking or walking on a frequent basis.

San Juan County recognizes the priority placed by its residents on having well connected networks of trails (San Juan County 2016a). In the recent survey, over 77 percent of respondents selected trails in parks and natural areas as one of their top five priorities for recreational programs or services in the county. Respondents also identified shoreline access as a key priority (San Juan County 2016a).

Throughout Washington State, recreation is expected to increase due to a combination of social and environmental conditions, overall population growth, and growing recreation on public lands. Demand for recreational opportunities has increased across the region. Eighty percent of state residents participate in nature related activities and 59 percent participate in wildlife viewing and photography (Ritchie et al. 2013). Walking and hiking are the second highest ranked outdoor recreational activities; the most popular statewide activity is picnicking, barbequing, or cooking out (Ritchie et al. 2013).

Recreation demand is also increasing nationally, as identified in the National Survey on Recreation and the Environment, which showed that between 2000 and 2007, the total number of people in the United States who participated in one or more outdoor activities grew by 4.4 percent (Cordell 2008). Prominent among the growing activities identified in the national survey were viewing and photographing natural scenery, flowers, trees, wildlife, birds, and fish. Based upon the documents referenced in this section, recreation demand is expected to continue to rise for the types of activities available in the Monument.

The reliance of many visitors on the Washington State Ferry system to access the San Juan Islands may eventually provide a limit on the increasing number of visitors. According to the Washington State Department of Transportation Ferries Division Final Long-Range Plan, there are no plans to substantially increase the capacity of the ferries serving the San Juan Islands for the foreseeable future (WDOT 2009).

Table 37: Monument total recreation, including all recreation sites and dispersed uses, from 2001−2014

Monument location	Visits													
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
Blind Island	7,900	7,700	7,750	7,750	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA
Cattle Point	12,200	10,100	9,950	9,900	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA
Chadwick Hill	3,700	3,200	5,500	5,250	2,400	3,467	3,507	3,208	2,060	2,000	2,000	2,000	2,000	2,000
Iceberg Point	15,300	13,000	15,500	15,210	10,500	7,543	5,209	4,676	3,090	3,000	5,000	6,500	5,000	5,000
Indian Island	9,550	7,650	7,500	7,450	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA
Kellett Bluff	320	250	250	250	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA
Patos Islands	8,500	6,900	6,500	6,450	5,500	7,128	7,030	7,204	6,695	6,500	6,500	8,450	6,500	6,500
Point Colville	3,500	3,100	3,200	3,100	2,200	3,102	3,074	2,897	2,060	2,000	2,000	2,600	2,000	2,000
Posey Island	Data NA	2,750	2,750	2,750	2,750	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA
Turn Point	13,750	12,200	12,000	11,735	10,500	10,239	10,112	9,673	6,180	6,001	8,500	8,700	6,000	6,001
Watmough Bay	17,500	16,000	15,500	15,450	10,500	10,215	10,368	10,110	9,370	23,100	15,700	17,300	5,000	5,000
Other Monument Rocks and Islands	8,750	7,900	7,800	7,780	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA	Data NA
Monument: Total Visits	**100,970**	**90,750**	**94,200**	**93,075**	**41,600**	**41,694**	**39,300**	**37,768**	**29,455**	**42,601**	**39,700**	**45,550**	**26,500**	**26,501**

Effects of the Alternatives

The alternatives would have varying impacts on the extent to which access and recreational opportunities are available in the Monument and, by extension, on the availability of recreational opportunities in the San Juan Islands as a whole.

General Recreational Use

The alternatives vary in the percent of the Monument that would be available for recreational use. Under all alternatives, the BLM would facilitate public access to Monument lands for scientific, educational, cultural, and spiritual purposes. The recreational closures in alternatives A, B, and C are intended to maximize protection to ecological and cultural resources; except under Alternative A, these closures encompass a small percentage of the Monument (Table 38). Alternatives B and C also include requirements for visitors to obtain permits to access certain areas of the Monument (see Table 39); these permits are intended to provide opportunities for visitors to experience solitude and quiet (see page 177).

The road and trail network designated for public use would also vary by alternative. An overview of the travel network under each alternative is described in this subsection. The details of the travel management decisions (e.g., the location of each trail segment within each travel management area) are available in Appendix H: Draft Travel and Transportation Management Plan. The effects of travel management decisions on trail-based recreational activities (hiking, biking, and equestrian use) are described in specific sub-sections below.

Table 38: Acres open to public recreational use by alternative

	No Action Alternative (Acres)	Alternative A* (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island†	23	0	23	23	23
Orcas Island†	42	0	42	42	42
Lopez Island†	508	0	508	508	508
Shaw Island†	5	0	5	5	5
Lummi Island†	50	0	50	50	50
Non- Ferry Served Islands and Rocks	393	0	382	386	393
Total	**1,021**	**0**	**1,011‡**	**1,014‡**	**1,021**

* Under Alternative A, the BLM would facilitate access for authorized scientific, educational scientific, cultural, and spiritual uses, but not for recreation.

† Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island acreage includes Indian Island)

‡Recreational use closures would apply to Category A and B rocks under Alternative B and Category C rocks under Alternative C. The BLM received comments specifically requesting that recreational use of rocks be restricted or prohibited.

Table 39: Acres requiring written authorization for access by alternative

	No Action Alternative (Acres)	Alternative A* (Acres)	Alternative B* (Acres)	Alternative C* (Acres)	Alternative D (Acres)
San Juan Island†	0	23	<1	0	0
Orcas Island†	0	42	32	0	0
Lopez Island†	0	508	2	0	0
Shaw Island†	0	5	3	0	0
Lummi Island†	0	50	50	0	0
Non- Ferry Served Islands and Rocks	0	393	80	4	0
Total	**0**	**1,021**	**167**	**4**	**0**

* Under Alternative A, the BLM would facilitate access for authorized scientific, educational scientific, cultural, and spiritual uses. Under alternatives B and C, permits would be issued for recreational use, in addition to authorized scientific, educational scientific, cultural, and spiritual uses.

†Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island acreage includes Indian Island)

Table 40: Miles of road open to public motorized access by alternative*

	No Action Alternative (Miles)	Alternative A (Miles)	Alternative B (Miles)	Alternative C (Miles)	Alternative D (Miles)
San Juan Island	0	0	0	0	0
Orcas Island	0	0	0	0	0
Lopez Island	0.5	0	0.5	0.1	0.5
Shaw Island	0	0	0	0	0
Lummi Island	0	0	0	0	0
Non- Ferry Served Islands and Rocks	0.5	0	0.5	0.4	0.4
Total	**1**	**0**	**1**	**.0.6†**	**0.9**

* Under alternatives B, C, and D, all roads would remain open to hiking, biking, and equestrian uses, regardless of whether they are open to public motorized use.

†Linear distances in this document are rounded to a 10th of a percent, which causes the occasional appearance of errors in totals.

Table 41: Trail miles open to non-motorized uses under each alternative

Public Mode of Travel	No Action Alternative (trail miles)	Alternative A (trail miles)	Alternative B (trail miles)	Alternative C (trail miles)	Alternative D (trail miles)
Hiking*	16	0	20	11.9	24.5
Bicycling*	16	0	0	0	8.4†
Equestrian*	16	0	0	2.6†	8.4†

Note: these miles include trails under U.S. Coast Guard jurisdiction on Monument adjacent lands at Cattle Point and Iceberg Point.[49]

*Under alternatives B, C, and D, existing Monument road would remain open to open to hiking, bicycling, and equestrian uses, regardless of whether it is open to public motorized use.

† Trail miles open to bicycle and/or equestrian access are also open to hiking (e.g. the 11.9 miles of trail open to hiking under Alternative C include the 2.6 miles of trail open to equestrian use.)

No Action Alternative

Under the No Action Alternative, the whole of the Monument (1,021 acres) would continue to be open to the public for recreational purposes without a permit. The 1990 ACEC decisions that apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay would continue to require members of the public to obtain permits for organized groups of 10 or more.

Under the No Action Alternative, there would remain no travel network designated for public access in the Monument. The BLM would continue to maintain the 1 mile of road in the Monument under this alternative (see Table 40). If levels of recreational use continue or increase, the current network of 14.9 miles of user created trails in the Monument and 1.2 miles of user created trails on adjacent Coast Guard lands at Cattle Point and Iceberg Point[49] would persist (see Table 43). Given proliferation of trails over the past decade, miles of user created trails at more accessible locations would increase over time.

[49] The BLM provides on the ground management support for these adjacent Coast Guard lands. While the BLM does not have decision-making authority over these lands, it will provide recommendations regarding the trail network to the Coast Guard based on this analysis.

Alternative A

Under Alternative A, the BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. As a result, no acres of Monument land would be available for recreation.

Under this alternative, there would remain no travel network designated for public access in the Monument. The BLM would close the 1 mile of road to public motorized use but would continue to maintain these existing road segments for authorized and administrative uses. It would also maintain trails as needed for routine and regular authorized and administrative uses (e.g., maintaining a trail for upkeep to the Coast Guard aide-to-navigation at Iceberg Point). Under this alternative, there would be no opportunity for visitors to use roads and trails to access the Monument for recreational purposes. The ability for visitors to use roads to access the Monument for authorized research, educational, cultural, and spiritual activities, as well as to access private property, would remain unchanged. The ability for visitors to use trails to access the Monument for authorized, but not routine, activities would decrease over time as trails reverted back to a natural state due to lack of use.

Alternative B

Under Alternative B, all but 10 acres of the Monument would remain open to recreational use and would be designated as RMAs. The BLM would prohibit recreational use of 10 acres categorized as Category A Rocks and Category B Rocks (see Appendix O for RMA frameworks). Monument land open to recreational use would decrease by approximately 1 percent.

In order to provide opportunities for solitude and quiet, 167 acres of the Monument would be open for recreation by permit only. This would enable the BLM to limit visitation to these areas in order to minimize interaction between members of the public. The areas that would be open to recreation by permit only would be Broken Point Island, Cape Saint Mary, Carter Point, Fauntleroy Rock, Kellett Bluff, Little Patos Island, Lopez Pass, Lummi Rocks, McConnell Rocks, Mud Island, Oak Island, Park Bay Island, President Channel, Reads Bay Island, and Richardson Rocks. Monument acres available for recreational use without a permit would decrease by approximately 16 percent (special recreation permits for organized groups are addressed on page 178).

Under Alternative B, the BLM would designate 1 mile of existing road for public motorized access at Point Colville, Turn Point, and Watmough Bay (see Table 40). This would maintain 100 percent of the current miles of road available for motorized visitor use in the Monument.

Under Alternative B, the BLM would designate approximately 19.5 miles of trail exclusively for hiking. It would also recommend that the Coast Guard designate approximately 1 mile of trail for hiking on its Monument adjacent lands at Iceberg Point and Cattle Point. Trail access would increase by 27 percent.

Alternative C

Under Alternative C, all but 7 acres of the Monument would be open to recreational use. The BLM would prohibit recreation on Category B Rocks. This would decrease the Monument land open to recreation by less than 1 percent. The BLM would also require permits to access Category A rocks for recreational purposes. Monument acres available for recreational use without a permit would decrease by less than 1 percent (special recreation permits for organized groups are addressed on page 178).

Under Alternative C, the BLM would designate 0.6 miles of existing road for public motorized access at Turn Point and Watmough Bay (see Table 40). The BLM would maintain an additional 0.4 miles of existing road for authorized and administrative motorized access, but would close these road segments to public motorized access (they would remain open to hiking, biking, and equestrian use). This would decrease the miles of road available for motorized visitor use in the Monument by 40 percent. Despite this substantial percent decrease, the closure would have a relatively minimal impact on the ability of visitors to access the Monument. Visitors to Point Colville would park at Watmough Bay and walk 0.3 miles to the Point Colville trailhead. The small segment of road that would be closed at Turn Point (approximately 0.1 miles) is currently used only for administrative access.

Under Alternative C, the BLM would designate approximately 11.3 miles of trail for public use (hiking and some equestrian use). Trail miles open to equestrian access are also open to hiking. It would also recommend that the Coast Guard designate approximately 0.7 mile of trail for hiking on Monument adjacent lands at Iceberg Point and Cattle Point. Trail access would decrease by 25 percent.

Alternative D

Under Alternative D, the entire Monument would remain open to recreational use without a permit and would be designated as a RMA (special recreation permits for organized groups are addressed on page 178).

Under Alternative D, the BLM would designate approximately 0.9 miles of existing road for public motorized use at Point Colville, Turn Point, and Watmough Bay (see Table 40). An additional approximately 0.1 miles of existing road would be maintained for authorized and administrative uses at Turn Point, but would be closed to public motorized use (it would remain open to hiking, biking, and equestrian use). Road available for visitors to access the Monument would decrease approximately 10 percent. The small segment of road that would be closed is currently used only for administrative access.

Under Alternative D, the BLM would designate approximately 23.4 miles of trail for public use (hiking and some equestrian and bicycling use). Trail miles open to equestrian or bicycling access are also open to hiking. It would also recommend that the Coast Guard designate approximately 1.15 mile of trail for public use (hiking and some equestrian and bicycling use) on its lands adjacent to the Monument at Iceberg Point and Cattle Point. Trail access would increase by 54 percent.

Cumulative effects of the alternatives on access in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of land open to the public for recreational use in the San Juan Islands, as well as the supply of opportunities easily available to residents and visitors on each island.

In the San Juan Islands there are an array of governmental agencies and non-profit organizations that provide approximately 23,882 acres of public access for a variety of recreation activities. Under the No Action Alternative and alternatives B, C, and D, the Monument would continue to provide approximately 4 percent of the overall acres available for recreational use in the San Juan Islands and 5 percent or less of public land easily accessible from most of the ferry served islands in the archipelago (see Table 30 on page 147). While this overall percent is small, the Monument accounts for more than half of the land open to the public for recreational use on Lopez Island. Other than the Monument planning process, there are no on-going efforts that would substantially change the availability of lands available for public recreational use within the San Juan Islands.

Under Alternative A, the Monument would no longer contribute to the supply of lands available to the public for recreational use. This would cause a four percent reduction in the acres of publically accessible land in the San Juan Islands. This small reduction in the overall land available for public recreational use in San Juan Islands could slightly increase competition for areas that remain open to recreational use. Under this alternative, there would be a 53 percent reduction in the land available for public recreational use on Lopez Island. While this alternative would not markedly reduce the overall lands available in the San Juan Islands, it would have a substantial impact on the supply of lands easily accessible for recreation to residents and visitors on Lopez Island.

Recreational Boat Landing

The alternatives vary in the miles of shoreline that would be open to recreational boat landing under each alternative (note: this is a function of locations being open or closed to recreational use, there are no separate decisions about shoreline use). Under all alternatives, the shoreline would continue to be open for emergency boat landing and for authorized and administrative uses. Under all alternatives, safe landing would be difficult or impossible on some portions of the shoreline regardless of whether it is technically open to recreational boat landing. Since the BLM's jurisdiction only extends to mean high tide, the alternatives do not otherwise address recreational boating.

Table 42: Monument shoreline open to recreational boat landing

	No Action Alternative (Miles)	Alternative A (Miles)	Alternative B (Miles)	Alternative C (Miles)	Alternative D (Miles)
San Juan Island*	.5	0	.5	.5	.5
Orcas Island*	.3	0	.3	.3	.3
Lopez Island*	3.9	0	3.7	3.9	3.9
Shaw Island*	0	0	0	0	0
Lummi Island*	1.1	0	1.1	1.1	1.1
Non- Ferry Served Islands and Rocks	15.3	0	10.7	11.9	15.3
Total	21.2	0	16.4	17.8	21.2

*Miles for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island miles includes Indian Island)

No Action Alternative

Under the No Action Alternative, all 21.2 miles of Monument shorelines would continue to be open to recreational boat landing. The opportunity for visitors to land recreational boats in areas that are safe and appropriate for their individual skill levels and watercraft type would remain unchanged.

Given trends in visitation, recreational boating landings on Monument shorelines would increase over time, particularly during high visitation seasons. The number of landings would continue to vary by location depending on the ease of landing and the remoteness of the site. Landings and shoreline access would continue to be unrestricted, except for the requirement for special recreation permits for organized, commercial, and competitive activities.

Alternative A

Under Alternative A, the BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. As a result, 0 miles of Monument shoreline would be available to recreational boaters for landings. All 21.2 miles of the Monument shoreline would continue to be open to landings for authorized research, educational, cultural, and spiritual activities. Under this alternative, recreational boaters could continue to enjoy the Monument from the water, but there would be no opportunity to land on the Monument for recreational purposes.

Alternative B

Under Alternative B, 16.4 miles of Monument shoreline would remain open to recreational boat landing. Under this alternative, the BLM would prohibit recreational use, including boat landing, to Category A and Category B Rocks (see Appendix O for RMA frameworks). It would also prohibit recreational boat landing at Watmough Bay in order to reduce potential disruption to juvenile forage fish close to shore, though recreational use of the area would otherwise be permitted. Under this alternative, the Monument shoreline available for recreational boat landing would decrease by 20 percent.

Shoreline associated with Category A and B rocks account for 4.6 miles of the 4.8 miles of shoreline that the BLM would close to recreational boat landing under this alternative. According to BLM personnel, these rocks currently receive relatively little visitation, so this prohibition would have a relatively minor impact on known recreational use. Non-motorized boats regularly land at Watmough Bay, particularly during the summer; small motorboats also occasionally land. The prohibition of recreational boat landing on 0.2 miles of shoreline on Watmough Bay would remove this recreational opportunity. If current visitation trends continue, recreational boating landings on Monument shorelines as a whole would increase over time, particularly during high visitation seasons (see affected environment, above).

In addition to shoreline closed to recreational boat landing, the BLM would require permits for recreational boat landing on 7.1 miles of Monument shoreline. This shoreline is associated with the areas that the BLM is managing for quiet and solitude by requiring permits for recreational use (see the Access section above for a list of areas for which permits would be required under Alternative B).

Alternative C

Under Alternative C, 17.8 miles of Monument shoreline would remain open to recreational boat landing. Under this alternative, the BLM would prohibit recreational use, including boat landing, to Category B Rocks (see Appendix O for RMA frameworks). It would also prohibit recreational motorboat landing at Watmough Bay in order to reduce potential disruption to forage fish spawning habitat close to shore; non-motorized recreational boat landings would continue. Under this alternative, the shoreline available for recreational boat landing would decrease by 16 percent.

The shorelines closed to recreational boat landing would all be associated with Category B rocks, which are rocks identified by the BLM as having relatively little recreation potential and/or relatively sensitive resources. According to BLM personnel, these rocks currently receive relatively little visitation, so this prohibition would have a relatively minimal impact on known recreational use. Small motorboats occasionally land at Watmough Bay; this prohibition would remove this opportunity. If current visitation trends continue, recreational boating landings on Monument shorelines would increase over time, particularly during high visitation seasons (see affected environment description above).

In addition to shoreline closed to recreational boat landing, the BLM would require permits for recreational boat landing on 1.2 miles of Monument shoreline. This shoreline is associated with Category A Rocks (this category includes seven rocks and groups of rocks that have some recreation potential: see Appendix O). These rocks are relatively small; the BLM would require permits under this alternative in order to control the number of visitors at these locations at a given time. Recreational boat landing without a permit would continue on 16.6 miles of Monument shoreline.

Alternative D

Under Alternative D, all 21.2 miles of Monument shoreline would remain open to recreational boat landing. If current recreational trends continue, boating landings on Monument shorelines would increase over time, particularly during high visitation seasons (see affected environment description above). Under Alternative D, the BLM would allow designated site camping for visitors arriving via non-motorized boat on 436 acres of Monument land. As new campsites were developed during plan implementation, recreational boat landings would increase at these sites.

Cumulative effects of the Monument's contribution to recreational boat landing in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of shoreline open for public recreational boat landing in the San Juan Islands.

The National Park Service, Washington State Parks, WDNR, WDFW, San Juan Preservation Trust, and San Juan County all manage shoreline that is open to at least some types of recreational boat landing. The majority of shoreline in the San Juan Islands is privately owned (San Juan County 2010). Other than the Monument planning process, there are no on-going efforts that would substantially change the availability of shoreline open to public recreational boat landing within the San Juan Islands.

Under the No Action Alternative and alternatives B, C, and D, the BLM would continue to provide a relatively small portion of the total shoreline available to the public for recreational boat landing in the San Juan Islands. Given the concern expressed by San Juan County residents around shoreline access, this contribution may be meaningful regardless of its size (San Juan County 2017).

Under Alternative A, the Monument would no longer contribute to the supply of lands available to the public for recreational use. This reduction in the overall availability of shoreline for recreational boat landing could increase competition for areas that remain open to recreational use. It would also limit the ability of visitors and residents to participate in non-motorized boat activities in areas where Monument lands are typically used as destinations or rest stops where there are no easily accessible and or nearby alternatives (e.g., Patos Island).

Hiking

The alternatives vary in the miles of trails that would be available for hiking in the Monument. Hiking (including walking) is currently one of the most popular activities within the more easily accessible Monument lands on Lopez and San Juan islands.

The effects of designating trails for multiple uses on the potential for visitor conflict are described below (page 180). For maps and information on route segments at each location with the Monument, refer to Appendix H for the Draft Comprehensive Travel and Transportation Plan.

Table 43: Monument trails open to hiking by alternative

	No Action Alternative (miles)	Alternative A (miles)	Alternative B (miles)	Alternative C (miles)	Alternative D (miles)
San Juan* Island	1.2	0	0.9	0.4	0.9
Orcas Island*	0.8	0	0.8	0.6	1.4
Lopez Island*	9.7	0	12.4	7.3	14.1
Shaw Island*	0.4	0	0.3	0.2	0.4
Lummi Island*	0.1	0	0.1	0.1	0.7
Non- Ferry Served Islands and Rocks	3.9	0	5.4	3.4	7
Total	**16**	**0**	**20**	**11.9**	**24.5**

Note: these miles include trails under Coast Guard jurisdiction on Monument adjacent lands at Cattle Point and Iceberg Point.

*Miles for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island miles includes Indian Island)

No Action Alternative

Under the No Action Alternative, 14.9 miles of existing trails would continue to be available to visitors participating in hiking in the Monument. There would continue to be no requirement that visitors remain on trails, though ease of access would cause most hiking to continue to be on trail. Assuming current management continues, there would continue to be 1.2 miles of trail available for hiking on Coast Guard lands adjacent to the Monument at Cattle Point and Iceberg Point.

Most trails would continue to be single track. There would continue to be 2.6 miles of double track tails at Cattle Point, Eliza Point, Iceberg Point, Patos Island, Turn Point, and Watmough Bay providing opportunities for visitors to hike next to their companions. This includes 0.6 miles of double track trail on adjacent Coast Guard lands at Cattle Point and Iceberg Point.

Given the past increase of trails miles under the BLM's custodial management approach, user created trails would continue to proliferate in the Monument under the No Action Alternative. If current recreation trends continue, participation in hiking in the Monument would increase over time, particularly during high visitation seasons at more accessible locations (see affected environment section above).

Alternative A

Under Alternative A, the BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. As a result, 0 miles of Monument trails would be available for recreational hiking. This would remove all currently available opportunities for this recreational activity in the Monument. Given that the adjacent Coast Guard lands at Cattle Point and Iceberg Point are accessible only through the Monument, the BLM would recommend that these trails also be closed.

The removal of opportunities for this activity would have the greatest impact on residents and visitors to Lopez Island and San Juan Island, where the majority of hiking on Monument trails currently takes place.

Alternative B

Under Alternative B, the BLM would designate 1,011 acres of the Monument as RMAs managed in part for hiking access (see Appendix O). To facilitate this use while providing additional opportunities for solitude and quiet, the BLM would designate 19 miles of trails in the Monument open exclusively to hiking. A small number of trails would be closed seasonally to avoid disturbance to nesting seabirds (0.04 miles of trail at Indian Island and 0.08 miles of trail at Skull Island)[50]. The BLM would also recommend that the Coast Guard designate 0.9 miles of trail for hiking on its lands adjacent to the Monument at Iceberg Point and Cattle Point. Opportunities for hiking on trails within and immediately adjacent to the Monument would increase by 26 percent (3.9 miles).

Under this alternative, the BLM would require visitors to remain on trails or on un-vegetated shorelines while hiking, except in locations that are open to recreation under this alternative but currently have no trails. Given that the majority of hiking is currently taking place on trail, this would have a limited impact on visitors partaking in this activity. Cross-country hiking would continue to be allowed at Fauntleroy Rock, Little Patos Island, Mud Island, Park Bay Island, President Channel, Richardson Rocks, and Twin Rocks (these are all low-visitation areas that would be open to recreation under this alternative and that currently have no trails). Under Alternative B, a permit is required to recreate at these areas.

Under this alternative, the BLM would narrow, and recommend that the Coast Guard narrow, 1.1 miles of double track trail. This would decrease miles of trail on which visitors can hike next to their companions from 2.6 miles to 1.5 miles.

Under Alternative B, 168 acres of the Monument would be open for recreation by permit only. These areas include 1.46 miles of trail at Broken Point Island, Cape Saint Mary, Carter Point, Kellett Bluff, Lopez Pass, Lummi Rocks, McConnell Rocks, Oak Island, and Reads Bay Island. Given the low visitation currently occurring at these locations—and the relatively small number of affected trail miles—this permit requirement would have a minor impact on hiking in the Monument. Visitors who are interested in opportunities to hike on trails at these locations could request a permit from the BLM.

If current recreation trends continue, participation in hiking in the Monument would increase over time, particularly during high visitation seasons at more accessible locations (see affected environment section above). The increased trail miles would potentially increase the dispersal of visitors engaging in hiking in the Monument. Under Alternative B, visitors would have an opportunity to hike on trail in areas currently unavailable for this activity, including on Kellett Bluff, the northeast section of Chadwick Hill, the north shore of Iceberg Point, the northeast side of Patos Island, and the northeast section of Point Colville. See Appendix H for maps with specific locations of these potential new trails.

Alternative C

Under Alternative C, the BLM would designate 1,014 acres of the Monument as RMAs managed in part for hiking access (see Appendix O). To facilitate this use while minimizing the footprint of trails in the Monument, it would designate 11.2 miles of trails in the Monument as open to hiking. The BLM would also recommend that the Coast Guard designate 0.7 miles of trail for hiking on its lands adjacent to the Monument at Iceberg Point and Cattle Point. Opportunities for hiking on trails within and immediately adjacent to the Monument would decrease by 25 percent (4.1 miles). The BLM would designate the majority of these trail miles exclusively for hiking; 2.6 miles would be designated for both hiking and equestrian use.

Under this alternative, the BLM would require visitors to remain on trails or un-vegetated shorelines while hiking, except in areas that are open to recreation under this alternative and currently have no trails. Given that the majority of hiking is currently taking place on trail, this would have a limited impact on visitors partaking in this activity. Cross-country hiking would continue to be allowed at East Sound Blind Island South, Fauntleroy Rock, Kanaka Bay Islands, King Islands, Little Patos Island, Massacre Bay Rocks, Mud Island, Park Bay Island, President Channel, Richardson Rocks (both the larger formation and the small rocks), Twin Rocks, Trinka Rock, and Unnamed Rock (WNW Kanaka Bay Island) (these are all

[50]The period of the seasonal closure would be based on BLM monitoring and could vary from year to year.

low-visitation areas that would be open to recreation under this alternative and currently have no trails). Under Alternative C, a permit would be required to recreate at East Sound Blind Island South, Kanaka Bay Islands, King Islands, Massacre Bay Rocks, Richardson Rocks (two smaller rocks), Trinka Rock, and Unnamed Rock (WNW Kanaka Bay Island), which compose the potential Category A Rocks RMA (see Appendix O: RMA Frameworks).

Under this alternative, the BLM would narrow, and recommend that the Coast Guard narrow, 1.5 miles of tail that would be designated under this alternative. This would decrease miles of trail on which visitors can walk next to their companions from 2.6 miles to 1.1 miles.

If current recreation trends continue, participation in hiking in the Monument would increase over time, particularly during high visitation season at more accessible locations (see affected environment section above). The reduced trail miles under this alternative would concentrate visitors participating in hiking on the remaining trails.

Alternative D

Under Alternative D, the BLM would designate all 1,021 acres of the Monument as RMAs to be managed in part for hiking access (see Appendix O). To expand opportunities for this activity it would designate 23.4 miles of trails in the Monument. The BLM would also recommend that the Coast Guard designate 1.2 miles of trail for hiking on its lands adjacent to the Monument at Iceberg Point and Cattle Point. Opportunities for hiking on trails within and immediately adjacent to the Monument would increase by 53 percent (8.5 miles). The BLM would designate the majority of these trail miles exclusively for hiking; 8.4 miles would be designated for hiking and equestrian use and/or bicycle use.

Visitors would continue to be allowed to hike cross-country under this alternative, though ease of access would cause most hiking to continue to be on trail.

Under this alternative, the BLM would widen, and recommend that the Coast Guard widen, 0.2 miles of trail. This would increase the miles of trail on which visitors can hike next to their companions from 2.6 to 2.8 miles.

If current recreation trends continue, participation in hiking in the Monument would increase over time, particularly during high visitation season at more accessible locations (see affected environment section above). Visitors would have an opportunity to hike on trail in areas currently unavailable for this activity, including on Kellett Bluff, the northeast section of Chadwick Hill, the north shore of Iceberg Point, the east side of Patos Island, and the northeast section of Point Colville. Those seeking opportunities to hike in the absence of equestrian or bicycle use might shift their use to areas and trails where these activities are not allowed under this alternative. See Appendix H for maps with specific locations of these potential new trails.

Cumulative effects on hiking opportunities in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of opportunities for hiking on trails in the San Juan Islands, as well as the supply of opportunities easily available to residents and visitors on each island. Table 44 provides the percent increase or decrease in the total trail network in both the San Juan Islands as a whole and for each ferry-served island.

Table 44: Percent change in San Juan Islands hiking trail miles

	Current Total Trail Miles (Monument and Non-Monument)	Alternative A (percent change)	Alternative B (percent change)	Alternative C (percent change)	Alternative D (percent change)
San Juan Island*	65	-2%	<-1%	-1%	0%
Orcas Island*	53	-1%	<-1%	0%	+1%
Lopez Island*	14	-69%	19%	-17%	+31%
Shaw Island*	3	-12%	<-1%	-5%	+3%

	Current Total Trail Miles (Monument and Non-Monument)	Alternative A (percent change)	Alternative B (percent change)	Alternative C (percent change)	Alternative D (percent change)
Lummi Island*	6	-2%	0%	<-1%	+10%
Non- Ferry Served Islands and Rocks	55	-7%	+3%	-1%	+6%
Total	**196**	**-8%**	**+2%**	**-2%**	**+4%**

* Miles for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island miles includes Indian Island)

In the San Juan Islands there are an array of governmental agencies and non-profit organizations that provide approximately 196 miles of publically accessible trails for hiking. Under the No Action Alternative, the Monument, and the adjacent Coast Guard lands, would continue to provide approximately 8 percent of the overall miles available for hiking in the San Juan Islands. The magnitude of this contribution varies substantially between islands (Table 44), with by far the most substantial contribution occurring on Lopez Island, where the Monument is a primary provider of trails for hiking. While new trails may be developed in the San Juan Islands over the life of the plan, the BLM does not have data to calculate how trail miles outside of the Monument would change.

Alternatives A and C would both decrease the overall supply of trails on public lands in the San Juan Islands. Under Alternative A, the overall opportunities for hiking on trail on public lands in the San Juan Islands would decrease by 8 percent if no new trails are developed or closed outside of the Monument. For Shaw Island, the closure of 0.4 miles of trail on nearby Blind and Broken Point islands would cause a 12 percent decrease in the overall trail miles available for hiking. On Lopez Island the supply of trails for hiking would decrease by 69 percent. Given the popularity of hiking as an activity in the San Juan County (San Juan County 2017), this would substantially impact visitors and residents seeking to participate in this activity on Lopez Island and increase demand for the approximately 4.3 miles of trail on Lopez Island not associated with the Monument.

Under Alternative C, the overall opportunities for hiking on trail in the San Juan Islands would decrease by 2 percent if no new trails are developed or closed outside of the Monument. On Lopez Island, miles available for this activity would decrease by 17 percent. This would increase demand for the remaining trails both within and outside of the Monument.

Alternatives B and D would both increase the overall supply of trails in the San Juan Islands. Under Alternative B, the overall opportunities for hiking on trail in the San Juan Islands would increase by 2 percent. On Lopez Island, the trail miles would increase by 22 percent, providing increased opportunities for visitors to disperse across the trail system, particularly during higher visitation seasons.

Under Alternative D, there would be a 4 percent increase in the overall supply of trails for hiking in the San Juan Islands if no new trails are developed or closed outside of the Monument. New trails at Carter Point (0.4 miles) and Lummi Rocks (0.2 miles) would increase the overall trail network for Lummi Island by 10 percent. On Lopez Island, the trail miles would increase by 31 percent, providing increased opportunities for visitors to disperse across the trail system, particularly during higher visitation seasons.

Equestrian Use

The alternatives vary in the number of RMAs that would be managed in part for equestrian use, as well as in the miles of trail that would be designated for this use. The BLM has received comments from members of the public requesting opportunities for this activity within Monument lands on the south end of Lopez Island; the BLM has also received comments from members of the public requesting that this use not be allowed (BLM 2015b,c, BLM 2016a,b). There is no current known equestrian use on Monument lands outside of Lopez Island. The BLM has not received comments requesting that trails be designated for this use in other parts of the Monument.

All trails in the Monument are currently open to all non-motorized uses. Equestrian use is currently occurring on a small number of these trails (approximately 1 mile).

The effects of designating trails for multiple uses on the potential for visitor conflict are described below (page 180).

For maps and information on route segments at each location with the Monument, see Appendix H for the Draft Comprehensive Travel and Transportation Plan.

Table 45: Monument trails open to equestrian use by alternative

	No Action Alternative (Miles)*	Alternative A (Miles)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island	1.2	0	0	0	0
Orcas Island	0.8	0	0	0	0
Lopez Island	9.7 (~1 mile currently used for equestrian)	0	0	2.6	8.4
Shaw Island	0.3	0	0	0	0
Lummi Island	0.1	0	0	0	0
Non- Ferry Served Islands and Rocks	3.9	0	0	0	0
Total	**16**	**0**	**0**	**2.6**	**8.4**

Note: these trail totals include trails under Coast Guard jurisdiction on Monument adjacent lands at Cattle Point and Iceberg Point.

*There are no current management decisions related to equestrian use so all trails are open to this use. There is currently limited equestrian use. Trails associated with Shaw Island, Lummi Island, Orcas Island, and non-ferry served islands and rocks would be challenging to access for equestrian use.

No Action Alternative

Under the No Action Alternative, there would continue to be a user created trail network open to all non-motorized uses. Equestrian use would continue to be allowed throughout the Monument, though, given that many Monument locations are only accessible by personal boat, this activity would remain primarily confined to the areas in which it currently takes place. It is likely that the current regular equestrian use of some trails at Chadwick Hill and Watmough Bay would continue.

Alternative A and Alternative B

Under both Alternative A and Alternative B, the BLM would not designate any RMAs for equestrian use. As a result, it would not designate any trails for equestrian use under these alternatives (i.e., all trails would be closed to equestrian use). Under both alternatives, all opportunities for trail-based equestrian use would be removed from the Monument. Under Alternative B, the Monument's existing 1 mile of road at Point Colville, Turn Point, and Watmough Bay would remain open to equestrian use.

The removal of opportunities for this activity would have the greatest impact on residents and visitors to Lopez Island currently engaging in this use on a small number of trails at Chadwick Hill and Watmough Bay. There is no current equestrian use, or known public interest in this use, on Monument lands outside of Lopez Island. As a result, this prohibition would have a nominal effect on opportunities for this activity in the Monument outside of Lopez Island.

Alternative C

Under Alternative C, the BLM would designate RMAs at Chadwick Hill and Watmough Bay to be managed in part for trail-based equestrian access. To facilitate this use, the BLM would designate a total of 2.6 miles of trails as open to equestrian travel. Except for a 0.2 mile gravel trail from the parking lot to

the beach at Watmough Bay, these trails would be closed to equestrian use during the wet season[51]. The Monument's existing 1 mile of road at Point Colville, Turn Point, and Watmough Bay would remain open to equestrian use. All other RMAs and trails would be closed to equestrian use.

While all trails in the Monument are currently open to equestrian use, it is likely that designating a set of trails explicitly for this use would increase the perceived opportunities for this activity across the Monument. This use is currently undertaken primarily by residents of Lopez Island, so increasing non-resident visitation may not affect rates of participation in this activity.

Alternative D

Under Alternative D, the BLM would designate RMAs at Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay to be managed in part for trail-based equestrian access. To facilitate this use, the BLM would designate a total of 7.9 miles of trail as open to equestrian travel. It would also recommend that the Coast Guard designate 0.3 miles of trail for equestrian use on its lands adjacent to the Monument at Iceberg Point.

Except for a 0.2 mile gravel trail from the parking lot to the bay at Watmough Beach, these trails would be closed to equestrian use during the wet season[51]. The Monument's existing 1 mile of road at Point Colville, Turn Point, and Watmough Bay would remain open to equestrian use. All other RMAs and trails would be closed to equestrian use.

While all trails in the Monument are currently open to equestrian use, it is likely that designating a set of trails explicitly for this use would increase the perceived opportunities for this activity across the Monument. This use is currently undertaken primarily by residents of Lopez Island. Given the challenges associated with transporting horses to the San Juan Islands, increases in non-resident visitation over time may not affect rates of participation in this activity. Under Alternative D, the development of new trails would create opportunities for equestrian use in areas currently unavailable for this activity, including the northeast section of Chadwick Hill, the north shore of Iceberg Point, and the northeast section of Point Colville. See Appendix H for maps with specific locations of these potential new trails.

Cumulative effects on equestrian opportunities in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of opportunities for trail-based equestrian use in the San Juan Islands, as well as the supply of opportunities easily available to residents and visitors on Lopez Island.

In the San Juan Islands, there are an array of governmental agencies and one private organization that currently provide approximately 34 miles of publically accessible trails used for equestrian travel (see Table 32 on page 150). Orcas Island has 12 miles of publically accessible trails used for equestrian travel; these trails are located in Moran State Park and in the San Juan County Land Bank's Turtleback Mountain property. On San Juan Island, there are 18 miles of publically accessible trails that are used for equestrian travel. On Lopez Island—the only island on which there is currently known equestrian use in the Monument—there are 4 miles of publically accessible trails used for equestrian travel. Given the difficultly and cost associated with transporting horses between islands, participants in this activity primarily benefit from local opportunities rather than from opportunities throughout the San Juan Islands (e.g., a resident of Lopez Island is unlikely to make substantial use of equestrian trails on Orcas Island). While new trails may be developed in the San Juan Islands over the life of the plan, the BLM does not have data to calculate how trail miles outside of the Monument would change.

Under the No Action Alternative, all trails within the Monument would continue to be open to, but not specifically managed for, equestrian travel. Assuming current trends continue, trail-based equestrian travel would continue to be limited to approximately 1 mile of Monument trail. Under the No Action Alternative, the BLM would continue to provide approximately 3 percent of the publically accessible trails used for equestrian travel throughout the San Juan Islands and approximately 25 percent of the trails

[51]The period of the seasonal closure would be based on BLM monitoring and could vary from year to year; it is likely to be from approximately mid-October to mid-May.

available for this use on Lopez Island. The Monument would remain one of the primary providers of opportunities for this activity on Lopez Island.

Under alternatives A and B, the Monument would not contribute to the supply of trail-based equestrian opportunities in the San Juan Islands. This would decrease the miles of trail currently used for this activity by approximately 3 percent in the San Juan Islands and by approximately 25 percent on Lopez Island. The removal of this opportunity from the Monument would have a limited impact on equestrians outside of Lopez Island. It would substantially impact visitors and residents seeking to participate in this activity on Lopez Island and increase demand for the approximately 3 miles of equestrian trails on Lopez Island not associated with the Monument. These alternatives would also preclude Monument trails not currently used for equestrian travel from absorbing any unmet demand for trails open to this activity.

Under alternatives C and D, the miles of trails designated for equestrian use would increase both in the San Juan Islands as a whole and on Lopez Island. Because all user created trails in the Monument are currently open to equestrian use, the theoretical opportunities for this activity would decrease under these alternatives. The trails managed specifically for this use would increase.

Under Alternative C, the supply of trails designated for equestrian use would increase by approximately 5 percent in the San Juan Islands and approximately 60 percent on Lopez Island. Under Alternative D, the supply of trails designated for this purpose would increase by approximately 21 percent in the San Juan Islands in general and approximately 197 percent on Lopez Island. Under both alternatives, opportunities to engage in this use would technically decline due to the current undesignated status of the trail system. It is likely, however, that explicit management of trails for this purpose would increase use.

Bicycle Use

The alternatives vary in the number of RMAs that would be managed in part for bicycle use, as well as in the miles of trail that would be designated for this use. The BLM has received comments from members of the public requesting opportunities for this activity on Monument trails on the south end of Lopez Island and at Cattle Point (San Juan Island). The BLM has also received comments from members of the public requesting that this use not be allowed (BLM 2015b,c, BLM 2016a,b).

All trails in the Monument are currently open to all non-motorized uses. The BLM is not aware of current, regular bicycle use at any Monument location.

The effects of designating trails for multiple uses on the potential for visitor conflict are described below (page 180).

For maps and information on route segments at each location with the Monument, see Appendix H for the Draft Comprehensive Travel and Transportation Plan.

Table 46: Monument trails open to bicycle use by alternative

Island	No Action Alternative (Miles)*	Alternative A (Miles)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island	1.2	0	0	0	0.2
Orcas Island	0.8	0	0	0	0
Lopez Island	9.7	0	0	0	8.2
Shaw Island	0.3	0	0	0	0
Lummi Island	0.1	0	0	0	0
Non- Ferry Served Islands and Rocks	3.9	0	0	0	0
Total	**16**	**0**	**0**	**0**	**8.4**

Note: these trail totals include trails under Coast Guard jurisdiction on Monument adjacent lands at Cattle Point and Iceberg Point.

*There are no current management decisions related to bicycle use so all trails are open to this use; there are no Monument trails regularly used for bicycle access. Trails associated with Shaw Island, Lummi Island, Orcas Island, and non-ferry served islands and rocks would be challenging to access by bicycle.

No Action Alternative

Under the No Action Alternative, there would continue to be a trail network open to all non-motorized uses. If current trends continue, bicycling would be only an occasional use of Monument trails.

Alternatives A, B, and C

Under alternatives A, B, and C, the BLM would not designate any RMAs for trail-based bicycle use (i.e., all trails would be closed to bicycle use). As a result, it would not designate any trails for bicycle use under these alternatives. Under alternatives B and C, the 1 mile of existing road in the Monument (at Point Colville, Turn Point, and Watmough Bay) would continue to be open to bicycle use.

The BLM has received comments requesting that bicycle access be allowed in specific locations or generally throughout the Monument, suggesting that there is some demand for bicycle trails that is not currently being met (BLM 2016a,b). While Monument trails are not currently being regularly used for bicycle travel, these alternatives would remove the potential for this demand to be met in the Monument.

Alternative D

Under Alternative D, the BLM would designate RMAs at Cattle Point, Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay to be managed in part for trail-based bicycle access. To facilitate this use, the BLM would designate a total of 8 miles of trail as open to bicycle travel. It would also recommend that the Coast Guard designate 0.3 miles of trail for bicycle use on its lands adjacent to the Monument at Iceberg Point and <0.1 miles of trail for bicycle use on its lands adjacent to the Monument at Cattle Point.

Except for a 0.2 mile gravel trail from the parking lot to the bay at Watmough Beach and a 0.2 mile trail from the road at Cattle Point, these trails would be closed to bicycle use during the wet season[52]. The 1 mile of existing road in the Monument (at Point Colville, Turn Point, and Watmough Bay) would continue to be open to bicycle use. All other RMAs and trails would be closed to bicycle use.

While all trails in the Monument are currently open to bicycle use, it is likely that designating a set of trails explicitly for this use would increase the perceived opportunities for this activity in the Monument. Under Alternative D, the development of new trails would create opportunities for bicycle use in areas currently unavailable for this activity, including the northeast section of Chadwick Hill, the north shore of Iceberg Point, and the northeast section of Point Colville. See Appendix H for maps with specific locations of these potential new trails.

Cumulative effects on bicycling opportunities in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of opportunities for trail-based bicycle use in the San Juan Islands, as well as the supply of opportunities easily available to residents and visitors on ferry-served islands.

In the San Juan Islands there are an array of governmental agencies and private organizations that provide nearly 60 miles of publically accessible trails used for bicycle travel (see Table 33). Orcas Island has 34 miles of trails open to this use, the majority of which are within Moran State Park. San Juan Island and Lopez Island respectively have 20 miles and 4.6 miles of publically accessible trails that are used for bicycle travel; the BLM is not aware of publically accessible trails on Lummi or Shaw islands that are open to this use. While new trails may be developed in the San Juan Islands over the life of the plan, the BLM does not have data to calculate how trail miles outside of the Monument would change.

Under the No Action Alternative, all trails within the Monument would continue to be open to, but not specifically managed for, bicycle travel. Assuming current trends continue, trail-based bicycle use would continue to be limited in the Monument, though opportunities for this activity would continue. Under the No Action Alternative, the Monument would continue to negligibly contribute to the supply of the publically accessible trails used for bicycle travel throughout the San Juan Islands. The potential would

[52]The period of the seasonal closure would be based on BLM monitoring and could vary from year to year; it is likely to be from approximately mid-October to mid-May.

remain for Monument trails in more accessible locations to absorb some demand for trail-based bicycling opportunities in the future.

Under alternatives A, B, and C, the Monument would not contribute to the supply of trail-based bicycling opportunities in the San Juan Islands. While this would negligibly impact the supply of trails currently used for bicycle travel in the San Juan Islands, it would preclude any eventual use of these trails to absorb unmet demand for trails open to this activity.

Under Alternative D, the miles of trails designated for bicycling use would increase both in the San Juan Islands as a whole and on Lopez and San Juan islands. Because all user created trails in the Monument are currently open to bicycle use, the theoretical opportunities for this activity would decrease under this alternative. The trails managed for this use throughout the San Juan Islands would increase by 14 percent. The trails managed for this use on Lopez Island and San Juan Island would increase by 174 percent and 1 percent respectively. This would substantially increase the trail miles managed for bicycle use available to residents and visitors on Lopez Island. The supply of trails managed for this use on Orcas, Shaw, and Lummi islands would remain unchanged.

Camping

The alternatives vary in Monument acres that would be open to different types of camping. The BLM has received comments from members of the public requesting that designated campsites be maintained or expanded and that camping generally be allowed where possible. The BLM has also received comments from members of the public requesting that camping be prohibited in specific areas or throughout the Monument (BLM 2015b,c, BLM 2016a,b).

The alternatives consider three types of camping: designated site camping, dispersed camping without a permit, and dispersed camping with a permit (limit to one group per night per location, no more than five campers). Dispersed camping means that no sites are identified and limited or no facilities are provided.

Table 47: Monument acres open to designated site camping by alternative

	No Action Alternative (Sites)	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island*	0	0	0	0	23†
Orcas Island*	0	0	0	0	3†
Lopez Island*	0	0	0	0	100†
Shaw Island *	4 existing sites (Blind Island)	0	2‡ (Blind Island)	2‡ (Blind Island)	2† (Blind Island)
Lummi Island*	0	0	0	0	8†
Non- Ferry Served Islands and Rocks	9 existing sites (Posey and Patos islands)	0	212‡ (Posey and Patos islands)	212‡ (Posey and Patos islands)	300†
Total	**NA**	**0**	**214**	**214**	**436**

*Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Shaw Island acreage includes Blind Island)

† The BLM would identify specific designated sites during plan implementation; disturbance would be likely to occur on a fraction of this acreage.

‡ Camping would be restricted to the existing designated campsites.

Table 48: Monument acres open to dispersed camping (no permit required) by alternative

	No Action Alternative (Acres)	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island*	23	0	0	0	0
Orcas Island*	42	0	0	0	33
Lopez Island*	4	0	0	0	370
Shaw Island*	5	0	0	0	3
Lummi Island*	50	0	0	0	43
Non- Ferry Served Islands and Rocks	392	0	0	0	86
Total	516	0	0	0	535

*Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island acreage includes Oak Island)

Table 49: Monument acres open to dispersed camping by permit only by alternative

	No Action Alternative (Acres)	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island*	0	0	<1	0	0
Orcas Island*	0	0	32	0	0
Lopez Island*	0	0	470	0	0
Shaw Island*	0	0	3	0	0
Lummi Island*	0	0	50	0	0
Non- Ferry Served Islands and Rocks	0	0	170	0	0
Total	**0**	**0**	**726**	**0**	**0**

*Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island acreage includes Oak Island)

Table 50: Monument acres closed to all camping

	No Action Alternative (Acres)	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island*	0	23	23	23	0
Orcas Island*	0	42	10	42	6
Lopez Island*	503	508	37	508	37
Shaw Island*	0	5	0	3	0
Lummi Island*	0	50	0	50	0
Non- Ferry Served Islands and Rocks*	0	392	9	173	6
Total	**503**	**1,021**	**78**	**799**	**49**

*Acres for ferry served islands include nearby, small islands that are easily accessible at low tide or by non-motorized boat (e.g., the Orcas Island acreage includes Indian Island)

No Action Alternative

Under the No Action Alternative, there would continue to be camping in designated sites at Blind, Patos, and Posey islands. Given current recreation trends, there would continue to be high levels of visitor participation in this activity during the summer.

The majority of the Monument (516 acres) would continue to be open to the public for dispersed camping with no permit required. The 1990 ACEC decisions that apply to 503 acres on Lopez Island (Chadwick

Hill, Iceberg Point, Point Colville, and Watmough Bay) would continue to prohibit overnight camping within these areas.

While dispersed camping is currently available on all Monument lands outside of Lopez Island, this use occurs infrequently. This activity could become more popular in the future if demand for camping opportunities in the San Juan Islands is not met outside of the Monument.

Alternative A

Under Alternative A, the BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. As a result, there would be no recreational camping available, though overnight use could be allowed for authorized uses.

The removal of opportunities for designated site camping in the Monument would substantially affect the many visitors who currently engage in this activity at Blind, Patos, and Posey islands. The prohibition on dispersed camping in the Monument would have a limited effect on current visitors given the very low-level of engagement in this activity. The BLM has received comments requesting additional camping opportunities within the Monument, however, suggesting that there is demand for camping not currently being met (BLM 2015b,c, BLM 2016a,b). This alternative would remove the potential for this demand to be met in the Monument.

Alternative B

Under Alternative B, as under all alternatives except for A, the BLM would continue to allow camping in designated sites at Blind, Patos, and Posey islands. Given current recreation trends, there would continue to be high levels of visitor participation in this activity during the summer.

The BLM would also allow dispersed camping by permit on 726 acres of Monument land. Permits would be limited to one group per night per location with no more than five campers. This would provide opportunities for visitors seeking quiet and solitude through a primitive camping experience. The requirement of a permit would limit the number of visitors able to participate in this activity.

Under this alternative, 78 acres of the Monument would be closed to all camping. This would include a continuation of the current camping prohibition at Watmough Bay, as well as a new prohibition on this activity at Freeman Island, Indian Island, Skull Island, Victim Island, and Category A and B Rocks. These closures would likely have a limited effect on visitors given the current very low-level of engagement in this activity in these areas and the continuation of camping opportunities at other locations.

Alternative C

Under Alternative C, as under all alternatives except for A, the BLM would continue to allow camping in designated sites at Blind, Patos, and Posey islands. Given current recreation trends, there would continue to be high levels of visitor participation in this activity during the summer.

The remainder of the Monument (799 acres) would be closed to camping. This would include a continuation of the current camping prohibition at Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay, as well as a new prohibition on this activity on 302 Monument acres currently open to this use. Given the very low-level of engagement in this activity, the prohibition on dispersed camping in the Monument would have a limited effect on current visitors. The BLM has received comments requesting additional camping opportunities within the Monument, however, suggesting that there is demand for camping not currently being met (BLM 2015b,c, BLM 2016a,b). Alternative C would remove the potential for this demand to be met in the Monument.

Alternative D

Under Alternative D, as under all alternatives except for A, the BLM would continue to allow camping in designated sites at Blind, Patos, and Posey islands. This could include designating new sites in these locations. Given current recreation trends, there would continue to be high levels of visitor participation in this activity during the summer.

Under this alternative, the BLM would also allow designated site camping on an additional 221 acres of Monument land. This would approximately double the current Monument acres open to designated site

camping. The BLM would determine specific locations for new designated sites during plan implementation; this would involve a separate project level planning and NEPA compliance process prior to any on-the-ground disturbance. Camping would only be allowed in these areas after the completion of the project level planning to designate sites. These sites would be developed in support of the Cascadia Marine Trail (see Special Designations) and would be open only to visitors arriving via non-motorized watercraft. Given the popularity of current designated site camping opportunities in the San Juan Islands, it is likely that visitor use of these sites would be high.

The BLM would continue to allow dispersed camping on 166 acres of Monument land currently open to this use. It would also allow this activity on 370 acres of land currently closed to this use at Chadwick Hill and Point Colville. While dispersed camping is currently a very limited use of the Monument, this use could become more popular if demand for camping is not met through other opportunities.

The remainder of the Monument (49 acres) would be closed to camping. This would include a continuation of the current camping prohibition at Watmough Bay, and a new prohibition on this activity at Indian Island, Twin Rocks, Victim Island, and Category B Rocks. This closure would likely have a limited effect on visitors given the current very low-level of participation in this activity and the availability under this alternative of camping opportunities in other parts of the Monument.

Cumulative effects on designated site camping opportunities in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of opportunities for camping in the San Juan Islands, as well as the supply of opportunities easily available to residents and visitors on each island.

In the San Juan Islands, there are an array of governmental agencies that manage approximately 467 designated campsites on public lands (see Table 35 on page 152). The ferry served islands cumulatively have 234 designated campsites on public lands, including 77 on Lopez Island, 5 on Lummi Island, 156 on Orcas Island, 17 on Shaw Island, and 30 on San Juan Island. Other than the Monument planning process, there are no on-going efforts that would substantially change the supply of camping opportunities within the San Juan Islands.

Under the No Action Alternative and alternatives B and C, the Monument would continue to provide approximately 3 percent of the designated campsites available on public lands in the San Juan Islands. All of these campsites are only accessible via personal watercraft, though the four on Blind Island are close enough to Shaw for the BLM to consider them as contributing to the recreational opportunities available to that community.

Under Alternative A, no designated site camping would be available within the Monument, reducing the overall supply of designated campsites on public land in the San Juan Islands by 3 percent. While this is a small percent of campsites, this closure would increase demand for other camping opportunities during high visitation periods.

Under Alternative D, the acres available for designated site camping within the Monument would almost double. While the BLM would determine the number and location of sites after gathering input during plan implementation, the Monument's contribution to the overall number of campsites in the San Juan Islands would increase over time under this alternative.

Under the No Action Alternative and alternatives B and D, the BLM would continue to provide the only dispersed camping opportunities within the San Juan Islands. While dispersed camping is currently a very limited use of the Monument, this use could become more popular if demand for camping during high visitation periods is not met through other opportunities. Under alternatives A and C, the BLM would not allow dispersed camping in the Monument. This would remove the possibility that the Monument could absorb camping demand not met in the rest of the San Juan Islands.

Hunting Using Firearms

Note: Based on public comments, the BLM has included discharge of firearm prohibitions in the range of alternatives. These prohibitions would affect hunting using firearms, but would not affect other forms of

hunting (e.g., bow hunting); in other words, all 1,021 acres would remain open to hunting under all alternatives. These prohibitions would also not affect hunting with firearms by Coast Salish tribal members.

The BLM does not regulate hunting per se; hunting in Washington State is regulated by WDFW. The BLM can restrict or prohibit the discharge of firearms within the Monument and is considering doing so within the range of alternatives.

The BLM is not aware of firearms being discharged in the Monument for target shooting or other non-hunting purposes, so potential closures would primarily affect opportunities for hunting with firearms. Non-firearm-based hunting would continue to be allowed under all alternatives to the extent consistent with WDFW laws and regulations.

The BLM included the consideration of firearm prohibitions in Alternative C and Sub-Alternative C due to public comments requesting that hunting using firearms be restricted or eliminated either in specific locations or in the Monument as a whole. These requests were generally linked to safety concerns around conflicts between hunters and other visitors. The BLM has also received comments from members of the public and agency partners requesting that all hunting opportunities be retained. These comments describe variously a desire to preserve recreational opportunities and concerns about the deer population in the San Juan Islands.

Secretarial Order 3356 calls for amending National Monument land use plans to "include or expand hunting, recreational shooting, and fishing opportunities to the extent practicable under the law." The lack of plan-level prohibitions on firearm discharge under the No Action Alternative, Alternative B, and Alternative D would best meet the direction provided in Secretarial Order 3356.

The effects of discharge of firearms prohibitions on the potential for visitor conflict are described below (page 180).

Table 51: Firearm prohibitions by alternative*

	No Action Alternative (Acres)†	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
San Juan Island	0	0	0	**23 (partial closure‡)** Sub-Alt C: **23**	0
Orcas Island	0	0	0	**0** Sub-Alt C: **42**	0
Lopez Island	0	0	0	**503 (partial closure‡)** Sub-Alt C: **508**	0
Shaw Island	0	0	0	**0** Sub-Alt C: **5**	0
Lummi Island	0	0	0	**0** Sub-Alt C: **50**	0
Non-ferry Served Islands and Rocks	0	0	0	**86 (partial closure‡)** Sub-Alt C: **393**	0
Total	**0**	**0**	**0**	**612 Sub-Alt C: 1021**	**0**

* All 1,021 acres of the Monument would be open to hunting under all alternatives.

†There are no current management decisions related to the discharge of firearms; all Monument lands are thus open to this use. Hunting with firearms is known to take place at least occasionally on 612 acres of Monument land.

‡Firearm discharge would be prohibited in these areas except for one half of the firearm-based hunting season. The BLM would work with WDFW annually to establish the prohibition period. This is currently how the San Juan County Land Bank manages Lopez Hill, the only non-Monument public land currently open to hunting on Lopez Island.

No Action Alternative, Alternative B, and Alternative D

Under the No Action Alternative and alternatives B and D, there would continue to be no prohibition on the discharge of firearms in the Monument. BLM-administered lands on which firearm discharge is not prohibited would continue to be open to this use, though may be subject to temporary closures for emergencies and public health and safety concerns.

Assuming continuation of current trends, hunting with firearms would continue at the contiguous Chadwick Hill, Point Colville, and Watmough Bay area (cumulatively approximately 406 acres) and Iceberg Point (approximately 97 acres). It would also likely occur occasionally at Cattle Point (23 acres) and Turn Point (86 acres). Most of the Monument's rocks and islands do not offer meaningful hunting opportunities due to their small size and lack of target species.

Alternative A

Under Alternative A, there would continue to be no prohibition on the discharge of firearms within the Monument. The BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual purposes, but not for recreation. As a result, hunting opportunities in the Monument would be substantially reduced. The BLM could also work in partnership with WDFW to authorize hunting to reduce over-population of wildlife species that are damaging plant communities.

This reduction in hunting opportunities would have the greatest effect on residents and visitors to Lopez Island, where most hunting within the Monument has been observed.

Alternative C

Under Alternative C, the BLM would prohibit firearm discharge in areas about which members of the public have specifically expressed concerns about hunting and/or the discharge of firearms, except for half of firearm-based deer hunting seasons to provide some opportunities for this activity. The BLM would work with WDFW on an annual basis to establish the period of time during which the prohibition would not apply. The San Juan County Land Bank currently takes a similar approach at Lopez Hill, which is the only non-Monument public land on Lopez Island that allows hunting.

This prohibition would affect 612 acres of Monument land, reducing the acreage on which the discharge of firearms is allowed year round by 60 percent. Specifically, the prohibition would cover Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay on Lopez Island; Cattle Point on San Juan Island; and Turn Point on Stuart Island. This prohibition would have the greatest effect on residents and visitors on Lopez Island, where most hunting within the Monument has been observed. The partial prohibition could cause more hunters to visit the Monument during the shortened season for firearm-based hunting, potentially increasing crowding and visitor conflict during this part of the season.

This prohibition would also remove opportunities for target shooting, though the BLM is not aware of any instances of this activity in the Monument.

The firearm prohibition included in this alternative would not affect non-firearm-based hunting within the Monument (e.g., bow hunting), which would continue to be allowed. It would also not affect the discharge of firearms by Coast Salish tribal members for the purposes of hunting.

Sub-Alternative C (same Recreation objectives and direction as Alternative C, except for direction around discharge of firearms)

Under Sub-Alternative C, the BLM would prohibit firearm discharge on all 1,021 acres of Monument land to the discharge of firearms. This prohibition would remove opportunities for hunting using firearms entirely from the Monument. It would have the greatest effect on residents and visitors on Lopez Island, which is where most hunting within the Monument has been observed. This prohibition would also

remove opportunities for target shooting, though the BLM is not aware of any instances of this activity in the Monument.

The firearm prohibition included in this alternative would not affect non-firearm-based hunting within the Monument (e.g., bow hunting), which would continue to be allowed. It would also not affect the discharge of firearms by Coast Salish tribal members for the purposes of hunting.

Cumulative effects on opportunities for firearm-based hunting in the San Juan Islands

The alternatives would vary in their incremental impact on the total supply of opportunities for hunting using firearms in the San Juan Islands, as well as the supply of opportunities easily available to residents and visitors on Lopez Island.

In the San Juan Islands, hunting is allowed on approximately 6,600 acres of public land managed by the BLM, WDFW, WDNR, and the San Juan County Land Bank (see Table 36). The majority of this acreage is on Cypress Island (5,100 acres), which is a non-ferry served island managed by WDNR. Other than the Monument planning process, there are no on-going efforts that would substantially change the supply of publically available hunting opportunities within the San Juan Islands.

Under the No Action Alternative and alternatives B and D, the BLM would continue to contribute approximately 16 percent of the public land on which hunting with the discharge of firearms is allowed in the San Juan Islands. This includes 52 percent of the public land available for hunting on Lopez Island; the non-Monument land open to this use on Lopez Island is closed to hunting for approximately half of hunting season.

Under Alternative A and Sub-Alternative C, the contribution of the Monument to opportunities for the public to hunt with firearms in the San Juan Islands would be substantially reduced. Under Alternative A, the BLM would continue not to prohibit firearm discharge, but would only permit access for authorized scientific, educational, cultural, or spiritual purposes. Under Sub-Alternative C, the BLM would prohibit firearm discharge within the Monument. This would reduce the public land open to hunting with firearms in the San Juan Islands by 16 percent and on Lopez Island by 52 percent. This would increase demand for hunting with firearms at Lopez Hill, which would be the only remaining public land on Lopez Island open to this use. It may also increase demand for hunting with firearms at Cypress Island, though this area is much more difficult to access than Monument lands open to this use on Lopez Island and San Juan Island.

This prohibition would also affect the opportunity for target shooting, though the BLM is not aware of any instances of this activity in the Monument. Outside of Monument lands, there are no public lands in the San Juan Islands on which target shooting is allowed. All current target shooting in the San Juan Islands occurs on private land.

The firearm prohibition included in Alternative C and Sub-Alternative C, would not affect non-firearm-based hunting within the Monument (e.g., bow hunting) or hunting by Coast Salish tribal members.

Solitude and Quiet

The alternatives vary in the Monument acres the BLM would manage explicitly to provide opportunities for solitude and quiet (i.e., opportunities for visitors to have no or minimal interaction with other visitors or disturbance from non-natural noise). The BLM has received comments from members of the public expressing appreciation for experiences of solitude and quiet in the Monument and asking that these experiences be maintained.

Under all alternatives, opportunities for solitude and quiet would continue to be available in the Monument. The availability of such opportunities would continue to be dependent on several factors, including the presence of overhead small planes and jets and nearby motorized boats, vehicles, and people. The impact of these factors varies substantially depending on the accessibility of the area and the time of year or day. The BLM has no jurisdiction over sources of disturbance outside of the lands it administers (e.g., boats in the water around the Monument or overhead planes and jets).

Experiences of quiet and solitude would continue to be most easy to find in Monument locations only accessible via personal watercraft. Monument lands on ferry served islands such as Lopez and San Juan Island, which are easily accessed by paved and gravel roads, would continue to offer these opportunities only on certain days and times.

No Action Alternative

Under the No Action Alternative, the BLM would continue not to manage any Monument lands explicitly for providing solitude and quiet. As described above, these opportunities would continue to be available throughout the Monument on less popular days and times for visitation.

Alternative A

Under Alternative A, the BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual purposes, but not for recreation. While the BLM would not manage any parts of the Monument explicitly for solitude and quiet, the substantial reduction in public visitation would incidentally increase opportunities for those experiences to members of the public visiting for one of the authorized purposes identified above. Alternative A would substantially decrease the potential disruption from competing visitor groups for those accessing the Monument for research, educational, cultural, and spiritual purposes.

Alternative B

Under Alternative B, the BLM would manage 167 acres of the Monument explicitly for solitude and quiet by requiring permits to access these areas. The BLM would provide permits to these areas in a number that ensures a low level of contact between visitors. Permit numbers would be established during implementation. Permits would be required to access Broken Point Island, Carter Point (Lummi Island), Fauntleroy Rock, Kellett Bluff (Henry Island), Little Patos Island, Lopez Pass (Lopez Island), Lummi Rocks, McConnell Rocks, Mud Island, Oak Island, Park Bay Island, President Channel (Orcas Island), Reads Bay Island, and Richardson Rocks. Seven of these areas were found by the BLM to have outstanding opportunities for solitude through the wilderness characteristics inventory process (see page 231 for more information).

The BLM would designate the majority of the Monument (726 acres) for dispersed camping by permit only. The BLM would allow one group per location per night with no more than five campers. This would provide opportunities to experience solitude and quiet while camping.

The BLM identified the second most extensive trail system under Alternative B with the intent of dispersing visitors across the Monument to enhance opportunities for solitude and quiet. Unlike Alternative D, which has the most extensive trail system, under Alternative B the BLM would limit trail access to hiking and would not provide additional facilities or designated site camping.

Alternative C

Under Alternative C, the BLM would continue not to manage any Monument lands explicitly for providing solitude and quiet. As described above, these opportunities would continue to be available throughout the Monument on certain days and times.

Under this alternative, the BLM would also require a permit to access the seven rocks that encompass the Category A Rocks RMA. Through its wilderness characteristics inventory (see page 231 for more information), the BLM found that one of these rocks (East Sound Blind Island South) has outstanding opportunities for solitude. These rocks are larger and have more recreation potential than those included in Category B Rocks, which are closed to recreational use under this alternative.

Alternative D

Under the Alternative D, the BLM would continue not to manage any Monument lands explicitly for providing solitude and quiet. As described above, these opportunities would continue to be available throughout the Monument on certain days and times.

Alternative D would have the most extensive trail network of any alternative, providing opportunities for users to disperse across the Monument. This may create additional opportunities for solitude and quiet, though increased designated site camping, access to some trails for equestrian and bicycle use, and the

potential for the development of new facilities under this alternative may attract additional visitors and lessen these opportunities during high visitation periods.

Commercial, Competitive, and Organized Group Activities

The action alternatives vary in whether the BLM would issue competitive special recreation permits for Monument lands.

Under the No Action Alternative, the BLM would continue to require organized groups of 10 or more to obtain special recreation permits within the areas included in the ACECs at the south end of Lopez Island (Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay). Permits would also continue to be required for organized (without a defined group size threshold outside of ACECs), commercial, and competitive group activities at all locations in the Monument.

Under all action alternatives, as required by regulation, the BLM would continue to require organized and commercial groups to obtain special recreation permits. The BLM would consider applications and determine appropriate group size limits as applicable during plan implementation.

Under alternatives A, B, and C, the BLM would not issue competitive special recreation permits because of the small size of the areas that compose the Monument and the potential for visitor conflict. Under Alternative D, the BLM would consider issuing such permits.

Other Recreational and Human Use Activities

The alternatives include decisions about activities that occur only occasionally within the Monument and that the BLM has not received comments from members of the public who would like to participate in these activities. The BLM anticipates that decisions on these activities would have a limited impact on the pertinent user group. Under the No Action Alternative, opportunities for these activities would continue, though the BLM assumes that participation would remain low.

Under all action alternatives, the BLM would prohibit the use of fireworks and the take-off and landing of manned aircraft (except for administrative or emergency purposes) within the Monument due to concerns about visitor safety and to protect sensitive cultural and ecological resources. The BLM would also prohibit the recreational use of metal detectors and establishment of physical geocaches due to concerns about disturbance of sensitive cultural resources.

The BLM would prohibit launching and landing of drones on Monument lands for recreational purposes under alternatives A and B. Under Alternative C, the BLM would only allow this use by permit. Under Alternative D, the BLM would continue to allow this use without a permit. Given the current limited participation in this activity, and the lack of public comments requesting access for this use, the BLM anticipates that the alternatives would have a minimal impact on recreational drone enthusiasts.

The BLM would prohibit rock climbing at Watmough Bay under alternatives A and B. Under Alternative C, the BLM would only allow rock climbing at Watmough Bay without the use of permanent anchors. Under Alternative D, the BLM would continue to allow rock climbing at Watmough Bay without restriction. Given the current limited participation in this activity within the Monument, and the lack of public comments requesting access for this use, the BLM anticipates that the alternatives would have a minimal impact on rock climbers.

Under the No Action Alternative, the 1990 ACEC decisions would continue to apply to Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay and would continue to require members of the public to obtain permits to collect vegetation. Under alternatives A, B, and D, the BLM would extend this management approach to the entire Monument. The BLM would prohibit all public collection of natural materials under Alternative C and would prohibit commercial collection of natural materials under alternatives A, B, and C. Under all, action alternatives, the BLM would restrict permit distribution as necessary to protect the Monument's ecological values. Given the current limited participation in this activity within the Monument, and the lack of public comments requesting access for this use, the BLM anticipates that the alternatives would have a minimal impact on public collection of natural materials. Under all alternatives, the Monument would remain open to collection of natural materials by Coast Salish tribal members for spiritual or traditional uses.

Potential User Conflict

The alternatives vary in their effect on potential conflict between visitor uses and the disruption of visitor uses by management activities. Specifically, they vary in the extent to which potentially conflicting activities would be allowed within the same location or trail and in the estimated extent of disruption to visitor use from vegetation management.

Throughout the county, many public lands are managed for potentially conflicting multiple visitor uses (e.g., trails open to hikers, equestrians, and bicycles, public lands open to both hunting and hiking, etc.). While management for multiple visitor uses is common, it does affect the experience of those participating in the various recreational activity (e.g., the experience of using a multiple use trail system is different than using a trail exclusively designated for hiking or mountain biking etc.) (Carothers et al 2001). Potential conflicts can be mitigated through measures such as directional trail signage and posted reminders about multiple recreational uses occurring during different times of year (e.g., reminding visitors that hunters may be present during hunting season).

The alternatives would also vary in the potential for visitor uses to be temporarily disrupted due to vegetation treatments. Visitor use of specific areas would be disrupted during mobilization, operation, and recovery periods in areas under going vegetation treatments. Where vegetation treatment did not require disruption in access, it could still change the visitor experience near the treatment site. As possible, the BLM would undertake vegetation treatments during lower use periods of the year. Under all alternatives, the BLM could institute temporary closures following the appropriate decision making and NEPA conformance processes to protect ecological values, cultural values, or human health and safety.

No Action Alternative

Under the No Action Alternative, all 1,021 acres of Monument land would remain open to potentially conflicting recreational activities. This includes there continuing to be no plan-level prohibition on the discharge of firearms and the user created trail network being open to all non-motorized uses. If current trends continue non-hiking uses of trails would occur on approximately one mile of user created trail and discharge of firearms would occur regularly only during hunting season on Monument lands on the south end of Lopez Island. The BLM has heard from and documented visitors and volunteers who feel unsafe on Monument lands on which firearms are being discharged for the purposes of hunting.

Under continued custodial management of the Monument, vegetation treatments would likely be minimal. Under the No Action Alternative, the BLM assumes that it would continue to undertake approximately 20 acres of vegetation treatments per year and that these treatments would continue to minimally disrupt visitor uses.

Alternative A

Under Alternative A, the prohibition on recreational use would greatly reduce the potential for conflict between visitor uses. There would be minimal potential disruption from other visitor groups for those accessing the Monument for research, educational, cultural, and spiritual purposes. The BLM would continue not to prohibit firearm discharge, so all 1,021 acres of Monument land would remain open to this use.

The relatively passive habitat management the BLM would undertake in Alternative A would create minimal disruptions to authorized human uses. Under this alternative, the BLM estimates that it would undertake approximately 1,040 acres of mechanical and biological vegetation treatment over the life of the plan (annual average of approximately 50 acres) (see Table 17 on page 111). This is more acreage of treatment than would occur under the No Action Alternative, but would continue to minimally disrupt visitor uses.

Alternative B

Under Alternative B, there would be some potential for conflict between visitor uses. The trail network would be open only to hiking, minimizing the potential for conflict between different modes of transportation on trails. The BLM would continue not to prohibit firearm discharge, so all 1,021 acres of Monument land would remain open to this use. The BLM has heard from visitors who feel unsafe on Monument lands on which firearms are being discharged for the purposes of hunting.

While this alternative would result in a relatively low potential for visitor conflict, the relatively large amount of vegetation treatment would periodically disrupt visitor use. Under this alternative, the BLM estimates that it would undertake approximately 11,700 acres[53] of mechanical, chemical, biological, and prescribed fire vegetation treatment over the life of the plan (annual average of approximately 585 acres) (see Table 18 on page 112). This level of treatment would periodically disrupt visitor uses, though, as possible, the BLM would undertake vegetation treatments during lower use periods of the year.

Alternative C

Under Alternative C, 2.6 miles of Monument trails would be open to both hiking and equestrian use and firearm discharge would be prohibited on 612 acres of Monument land except for half of hunting season[54]. There would be a higher potential for visitor conflict due to multiple uses on trails under Alternative C than alternatives A and B, but less than under Alternative D or the No Action Alternative. The partial discharge of firearms prohibition would reduce the potential for visitor conflict except for one half of the hunting season, during which hunting with the discharge of firearms could coincide with other visitor uses of the Monument. The partial prohibition could cause more hunters to visit the Monument during the shortened season for firearm-based hunting, potentially increasing visitor conflict during this part of the season. The BLM has heard from visitors who feel unsafe on Monument lands on which firearms are being discharged for the purposes of hunting.

The firearm prohibition included in this alternative would not affect non-firearm-based hunting within the Monument (e.g., bow hunting) or hunting by Coast Salish tribal member.

This alternative would also have the second greatest for potential disruption from vegetation treatments. Under this alternative, the BLM estimates that it would undertake approximately 17,733 acres[55] of mechanical, chemical, biological, and prescribed fire vegetation treatment over the life of the plan (annual average of approximately 885 acres) (see Table 19 on page 114). This level of treatment would periodically disrupt visitor uses, though, as possible, the BLM would undertake vegetation treatments during lower use periods of the year.

Sub-Alternative C

The effects on the potential for conflict and disruption under sub-alternative C would be similar to under Alternative C. Under Sub-Alternative C, the BLM would prohibit firearm discharge on all 1,021 acres of the Monument throughout the year. This would reduce the potential for visitor conflict during hunting season. The BLM has heard from visitors who feel unsafe on Monument lands on which firearms are being discharged for the purposes of hunting.

The firearm prohibition included in this alternative would not affect non-firearm-based hunting within the Monument (e.g., bow hunting) or hunting by Coast Salish tribal member.

The prohibition on chemical treatments would require more repetition of mechanical treatment to achieve the alternative's restoration objectives. Under this alternative, the BLM estimates that it would undertake approximately 35,600 acres [55]of mechanical, biological, and prescribed fire vegetation treatment over the life of the plan (annual average of approximately 1,780 acres) (Table 20 on page 115). This level of treatment would periodically disrupt visitor uses, though, as possible, the BLM would undertake vegetation treatments during lower use periods of the year.

Alternative D

Under Alternative D, approximately one third of Monument and immediately adjacent Coast Guard trails would be open to multiple modes of travel. This would include 7.7 miles of Monument trails open to

[53] This includes the application of different types of treatments to overlapping acres—e.g., a particular treatment could include 200 acres of mechanical treatment and 200 acres of chemical treatment.

[54] The BLM would work with WDFW to coordinate when the closure would not apply. A similar approach is currently implemented at Lopez Hill, which is managed by the San Juan County Land Bank. Lopez Hill is the only non-Monument public land on Lopez Island that allows hunting.

[55] This includes the application of different types of treatments to overlapping acres—e.g., a particular treatment could include 200 acres of mechanical treatment and 200 acres of chemical treatment.

hiking, equestrian use, and bicycling use; 0.7 miles open to hiking and equestrian travel only; and 0.7 miles open to hiking and bicycling travel only. The remaining 15.4 miles would be open only to hiking. There would be a higher potential for visitor conflict due to multiple uses on trails under Alternative D than under alternatives A, B, and C, but less than under the No Action Alternative. The BLM would continue not to prohibit firearm discharge, so all 1,021 acres of Monument land would remain open to this use. The BLM has heard from visitors who feel unsafe on Monument lands on which firearms are being discharged for the purposes of hunting.

This alternative would have slightly more potential for visitor use disruption from vegetation treatments than the No Action Alternative and Alternative A, but substantially less than under alternatives B, C, and Sub-C. Under this alternative, the BLM estimates that it would undertake approximately 1,300 acres[55] of mechanical, chemical, biological, and prescribed fire vegetation treatment over the life of the plan (annual average of approximately 65 acres) (see Table 21 on page 116). This level of treatment would occasionally disrupt visitor uses, though, as possible, the BLM would undertake vegetation treatments during lower use periods of the year.

Recreation and Visitor Services Issue 1 Conclusions

Table 52 summarizes the effects of the alternatives on visitor opportunities and access. It describes each alternative as causing an increase, decrease, or no change (+,-,=) in each visitor opportunity compared to current conditions.

The No Action Alternative and Alternative D generally provide the most opportunities for recreational activities within the Monument. By supporting a range of recreational activities they also, however, have the greatest potential for conflict between visitors. Alternative A provides the least public access and visitor use opportunities and has the least potential for visitor conflict. Alternative B focuses on hiking access and dispersed camping with management controls to maximize opportunities for solitude and quiet while participating in recreational activities. Alternative C provides some hiking and equestrian access and is the most restrictive alternative in relation to camping.

The cumulative effects of the alternatives on the supply of various recreational opportunities in the San Juan Islands are described under the opportunities sub-sections above.

Table 52: Summary of the effects of the alternatives on access and visitor opportunities

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Access	=	-	-	-	+
Recreational boat landing	=	-	-	-	=
Hiking	=	-	+	-	+
Equestrian	=	-	-	+	+
Bicycling	=	-	-	-	+
Dispersed camping without permit	=	-	-	-	-
Dispersed camping w/ permit	=	-	+	=	=
Designated site camping	=	-	=	=	+
Hunting with firearms	=	-	=	-	=
Opportunities for quiet and solitude	=	+	+	=	-
Minimizing potential for user conflict	=	+	+	=	=
Minimizing potential for disruption due to management activities	=	+	-	-	=

Recreation and Visitor Services Analytical Issue 2: *How would the BLM's designation of recreation opportunity spectrum classes across the alternatives affect recreation settings in the Monument?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The BLM categorizes the type of setting that exists or is desired for a particular area using its recreation opportunity spectrum. The recreation opportunity spectrum is divided into six classes ranging from primitive to urban. Lands are categorized into these classes based on their recreation setting characteristics. See the Recreation and Visitor Services Issue 2 section in Appendix E for more background information on recreation setting characteristics.

Using the process described in Appendix E, the BLM determined that nearly all lands in the Monument currently fall into either the primitive or back county recreation opportunity spectrum classes (Table 53). The BLM made this determination by identifying each area's: a) physical setting in terms of its remoteness (i.e., how far it is from a road or bicycle trail) and level of development; b) social setting in terms of visitation levels; and, c) operational setting in terms of level of visitor controls. In general, Monument lands currently have both minimal visitor facilities and minimal visitor controls (restrictions). See the No Action Alternative on page 8 for an overview of current visitor controls.

The majority of Monument lands on Lopez Island and San Juan Island, as well as Turn Point on Stuart Island, are within half a mile of a road. No other Monument lands are in close proximity to roads. Some Monument lands receive regular visitation, while those that are less accessible or less well known receive relatively little (see Table 37 on page 156).

Currently 360 acres of Monument lands have visitor facilities and interpretive displays: Blind Island (2 acres), Cattle Point (23 acres), Patos Island (211 acres), Posey Island (1 acre), Turn Point (86 acres), and Watmough Bay (37 acres). The remainder of the Monument does not have visitor facilities or interpretive signage. Visitors seeking an entirely undeveloped visitor experience can find it within the remaining 661 acres of Monument land.

The 19 percent of Monument land the BLM identified as primitive tends to be farther from roads, have less developed facilities, and lower visitation. The 81 percent of Monument land the BLM identified as back country tend to be closer to roads and/or have more developed visitor facilities (e.g., toilets and/or kiosks), and higher levels of visitation. The BLM identified both Posey and Blind islands as currently falling into the middle county class due to the combination of small size (less than 2 acres each) and relatively high visitation levels (see Table 37 on page 156), existing designated site camping, composting toilets, picnic tables, and informational signage.

Recreational experiences are also shaped by the plant communities in which they take place. While all recreation opportunity spectrum classes can occur in any vegetation community (e.g., both forested and grassland communities can have primitive or back country classes depending on their proximity to roads, level of development, etc.), changes to the vegetation community do affect the user experiences. Currently, over 800 acres of the Monument are in the forest and woodlands vegetation class; just 126 acres are non-wetland grassland and shrubland.

Table 53: Monument acres currently within each inventoried recreation opportunity spectrum class

Recreation Opportunity Spectrum Class	Monument Land Currently within Class	
	Acres	Percent
Primitive	193	19%
Back Country	824	81%
Middle Country	4	<1%
Front Country	0	0
Rural	0	0
Urban	0	0

Effects of the Alternatives

The alternatives would vary in their impact on the recreational setting characteristics of locations within the Monument. Specifically, they would vary in the acres of each setting characteristic classification the BLM would designate under each alternative and in how potential visitor facility development would affect the setting characteristics under each alternative. The recreation opportunity spectrum class the BLM would designate for RMAs under each alternative can be found in Appendix O: RMA Frameworks.

Due to natural succession and the alternatives' vegetation management objectives, the plant communities experienced by visitors would change somewhat under each alternative. While this would not change an area's recreation opportunity spectrum class, it would change the experience of Monument visitors, e.g., even with the same level of remoteness, development, and visitor controls, the experience of hiking through a forest is different from the experience of hiking through a grassland. Under the No Action Alternative and Alternative A, visitors to the Monument would experience more forest and generally more densely vegetated communities over the next 20 years than they would under alternatives B and C. Under Alternative D, the BLM would manage vegetation to maintain approximately the current conditions. See Habitat and Plants Issues 1 and 2 for more details about how the alternatives would affect plant communities within the Monument.

Table 54: Monument acres within each recreation opportunity spectrum class by alternative

Recreation Opportunity Spectrum Class	No Action Alternative (acres)	Alternative A (acres)	Alternative B (acres)	Alternative C (acres)	Alternative D (acres)*
Primitive	193	197	59	10	6
Back Country	824	824	958	1007	381
Middle Country	4	0	4	4	633
Front Country	0	0	0	0	0
Rural	0	0	0	0	0
Urban	0	0	0	0	0

* Totals only 1,020 acres due to a rounding issue (i.e., the acres falling into two of the classes round down instead of up while under other alternatives the acres round up).

Table 55: Percent of Monument acres shifting to more or less primitive classes by alternative

	No Action Alternative (acres)	Alternative A (acres)	Alternative B (acres)	Alternative C (acres)	Alternative D (acres)
More primitive class	0%	<1%	0%	0%	0%
Less primitive class	0%	0%	13%	18%	80%
No change	100%	99%	87%	82%	20%

All alternatives would have at most a minor effect on the remoteness characteristic of each area's physical setting. This is because access to Monument lands is generally provided by non-BLM-administered roads or through personal watercraft. The proximity of Monument lands to roads would remain the same under all alternatives. Under Alternative D, land in the northwest corner of Chadwick Hill that is not within ½ mile of a road would be within ½ mile of new trails designated for bicycle use. All other areas in which the BLM would designate new trails for bicycle use under Alternative D are already within ½ mile of a road or driveway; Alternative D would thus not change the remoteness of these areas.

The alternatives vary in their effect on the naturalness/development characteristic of each area's physical setting. New recreational facilities and interpretive and educational signs would be prohibited under alternatives A and B, but would be allowed in most areas under alternatives C and D. Each area's recreation opportunity spectrum class would influence the level of recreational development that would occur during plan implementation. For example, new educational signs and recreational facilities would be allowed at Cattle Point under both alternatives C and D, but the level of development would be lower under Alternative C in order to meet the designated back county setting class. The BLM has heard both from members of the public who would like to see the Monument managed in an as undeveloped a

manner as possible and from members of the public who would like to see additional signs and visitor facilities (BLM 2016a,b).

The characteristics of an area's social setting (i.e., visitor contacts, group size, and evidence of use) would likely parallel the changes in the physical recreation setting characteristics (e.g., areas with more developed facilities are likely to attract more visitors). One exception may be areas that emphasize hiking. Except for under Alternative A, RMAs such as Watmough Bay may see an increase in visitor contacts, group size, and evidence of use, regardless of the designated recreation opportunity spectrum class, due to the increasing recreation trends in the area (see page 155).

The alternatives would also vary in their effect on management controls and visitor information. The alternatives vary in the extent to which the BLM would control visitor use by allowing or prohibiting various recreational activities (see Recreation and Visitor Services Issue 1). The alternatives would also vary in the extent to which signage would be present on the landscape, though in all cases signs needed to protect visitor safety and sensitive cultural and ecological values would be allowed.

The alternatives would not affect front country, rural, and urban settings because these classes do not currently exist within the Monument and are not included under any of the alternatives.

No Action Alternative

Under the No Action Alternative, there would continue to be no management decisions related to recreation setting characteristics. It is likely that the majority of the Monument would retain either a back country or primitive setting, with limited visitor facilities (see Table 53). Blind and Posey islands—which are respectively 2 and 1 acres, receive substantial visitation and have facilities including vault toilets, fire rings, and picnic tables—would likely retain their current middle county setting.

The level of current visitor facilities within the Monument would likely remain unchanged, with 360 acres having some level of facilities and the remaining 661 having no visitor facilities or interpretive displays.

Alternative A

Under Alternative A, members of the public visiting the Monument—who would be restricted to those with authorization to access the Monument for scientific, educational, cultural, or spiritual purposes—would experience the least developed landscape of any of the alternatives, as well as the lowest level of visitor contacts Under this alternative, the BLM would not develop additional visitor facilities or signage, with the exception of signs needed to protect public health and safety and ecological and cultural values. While these changes to characteristics would lead to more primitive physical and social settings, the substantial increase in visitor controls would lead to less primitive operational settings.

Under this alternative, the BLM would designate 19 percent of the Monument (197 acres) as primitive and 81 percent (824 acres) as back country. The 4 acres of Monument lands with a middle country setting would shift to back country due to a substantial decrease in visitation and the likely removal of some existing visitor facilities (e.g., fire rings). Under this alternative, 99 percent of Monument lands would remain in their current recreation opportunity spectrum class (see Table 55).

Alternative B

Under Alternative B, the BLM would not develop additional visitor facilities or signage, with the exception of signs at trailheads and those needed to protect public health and safety and ecological and cultural values. Visitor controls would increase compared to the No Action Alternative, including limiting all trail use to hiking (i.e., closing all trails to equestrian and bicycle use) and allowing dispersed camping by permit only. Visitor contacts in most of the Monument would remain largely determined by the accessibility of the site and would continue to be affected by increasing trends in visitation. The BLM would manage 16 percent of the Monument to provide opportunities for quiet and solitude by limiting visitor numbers through a permit system.

Under Alternative B, the BLM would designate 6 percent of the Monument (59 acres) as primitive, 94 percent (958 acres) as back country, and 3 percent (4 acres) as middle country (see Table 54). Under this alternative, 87 percent of Monument lands would remain in their current recreation opportunity spectrum

classes; 13 percent would move from primitive to back country (see Table 55). This would result in a small impact on visitors seeking a primitive experience with minimal restrictions on their activities.

Alternative C

Under Alternative C, the BLM would allow the development of new visitor facilities and signage beyond trailheads on 99 percent of Monument lands. Such developments would not be allowed on Monument rocks (9 acres), which include all areas managed for their wilderness characteristics under this alternative. In areas designated as primitive and back country under this alternative, the BLM would allow a lower level of facility and signage development compared to areas with middle country designations. The design and location of facilities would be determined during plan implementation.

Visitor controls would increase compared to the No Action Alternative, including limiting 95 percent of trails to hiking (i.e., closing them to equestrian and bicycle uses), prohibiting firearm discharge on 59 percent of the Monument for most of the year, and allowing camping only in designated sites. Visitor contacts in the Monument would remain largely determined by the accessibility of the site and would continue to be affected by increasing trends in visitation.

Under Alternative C, the BLM would designate less than 1 percent of the Monument (10 acres) as primitive, 99 percent (1,007 acres) as back country, and less than 1 percent (4 acres) as middle country (see Table 54). Under this alternative, 82 percent of Monument lands would remain in their current recreation opportunity spectrum classes; 18 percent would move from primitive to back country (see Table 55). As with Alternative B, there would be a small impact on visitors seeking a primitive experience with no developments and few restrictions on their activities.

Alternative D

Under Alternative D, the BLM would allow the development of new visitor facilities and signage beyond trailheads on 77 percent of the Monument. Such developments would not be allowed in areas managed for their wilderness characteristics or on Category B Rocks. In areas designated as middle country, the BLM would allow a higher level of facility and signage development compared to back country and primitive designations. Facility design and location would be determined during plan implementation.

Visitor controls would increase compared to the No Action Alternative, but would be lower than under the other action alternatives. Visitor controls would include limiting 77 percent of trails to hiking and increasing areas where camping would only be allowed in designated sites. Visitor contacts in the Monument would remain largely determined by the accessibility of the site and would continue to be affected by increasing trends in visitation.

Under Alternative D, the BLM would designate less than 1 percent of the Monument (6 acres) as primitive, 37 percent (381 acres) as back country, and 62 percent (633 acres) as middle country (see Table 54). Under this alternative, 20 percent of Monument lands would remain in their current recreational opportunity spectrum class; 80 percent would move from either primitive to back country or from back country to middle country (see Table 55). There would be a moderate beneficial impact on visitors seeking a middle country setting and experience. There would be some displacement of visitors seeking a back country setting and experience. As with alternatives B and C, there would be a small impact on visitors seeking a primitive experience with no developments and few restrictions on their activities.

Conclusion

Under the No Action Alternative and alternatives A, B, and C, the great majority of Monument lands (between 100 percent and 82 percent) would remain in their current recreation opportunity spectrum classes (see Table 55). Under Alternative A, less than 1 percent of acres would shift to a more primitive class. Under alternatives B and C, 13 and 18 percent of acres respectively would shift from primitive to back country classes due to more restrictive operational settings in combination with limited changes to social and physical settings.

The largest shift in recreation opportunity spectrum classes would occur under Alternative D. Under this alternative, 80 percent of the Monument would shift to a less primitive class compared to the current class (either from primitive to back country or from back country to middle country) (see Table 55). Under

Alternative D, the BLM would designate the majority of the Monument as middle country. This alternative would increase opportunities and experiences for visitors who prefer a more developed setting.

Under alternatives B, C, and D, there would be a decrease in Monument acres in the primitive class. This would decrease opportunities for individuals seeking limited visitor controls and entirely undeveloped recreational settings. Under all alternatives there would continue to be a mix of settings that provide a variety of visitor experiences.

Cumulative effects on the Recreation Setting Characteristics

Throughout the San Juan Islands, there are opportunities for visitors to experience a variety of recreation settings. Publically accessible lands include a wide-range of physical settings, including easily accessible areas with fully developed visitor facilities and remote and undeveloped areas accessible only by personal watercraft. Social settings also vary substantially by location and by season. More easily accessible public lands tend to attract more visitors and, at least during higher visitation seasons, are likely to have larger groups and more contacts between visitors. Even during higher visitation seasons, more remote areas are likely to have few visitor contacts and smaller group sizes. Operational settings in the San Juan Islands are generally characterized by visitor controls that are more restrictive than the visitor controls currently in place within the Monument (see Recreation and Visitor Services Issue 3 section in Appendix E). For example, outside of the Monument, dispersed camping is not allowed on any public lands within the San Juan Islands and hunting is allowed in only a small number of publically accessible areas.

Under the No Action Alternative, the BLM would continue to provide some of the few publically accessible areas in the San Juan Islands with limited visitor controls. Under all action alternatives, opportunities for members of the public seeking primitive and unconstrained recreational experiences would be reduced. Opportunities for back country and middle country settings are readily available in the San Juan Islands; under all alternatives, the BLM would have a limited effect on the supply of these recreation settings.

Recreation and Visitor Services Analytical Issue 3: *How would the alternatives indirectly affect the management of human use activities on nearby non-BLM-administered lands in the San Juan Islands?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The management of public lands and private lands with secured public access in the San Juan Islands varies substantially between management entities. Most, though not all, of the public lands in the San Juan Islands are managed at least in part for public access and enjoyment, though the types of uses allowed vary between areas and managers. Activities permitted or restricted by a land management agency can have indirect effects on the other land management agencies in the area. For example, decreasing camping opportunities in one area might increase demand for camping opportunities provided in a different area. Similarly, allowing a particular activity in one area may create challenges if an adjacent land manager prohibits the same activity.

Non-BLM public land managers in the San Juan Islands generally have more restrictions on recreational use than those currently in place within the Monument. The Recreation and Visitor Services Issue 3 section in Appendix E provides an overview of how public lands in close proximity to the Monument are managed. Specifically, these overviews describe each visitor management approach and the types of activities each entity allows.

Effects of the Alternatives

The alternatives would vary in how consistent or inconsistent the management of Monument lands is with the management of other public lands in the vicinity. The BLM has heard concerns from other land management agencies in the San Juan Islands about the potential for inconsistent management to cause visitor confusion and management challenges.

Under all action alternatives, the BLM would—for the first time—have management objectives and allowable and prohibited use decisions for all Monument lands. This would make it easier for the BLM to communicate clearly to the public about what uses are and are not allowed within the Monument as opposed to nearby non-BLM-administered public lands.

No Action Alternative

Under the No Action Alternative, the entire Monument would continue to be open to the public for recreational purposes and there would continue to be limited restrictions on recreational activities (see Recreation and Visitor Services Issue 1). The BLM would continue not to prohibit firearm discharge at the plan level on all Monument lands. The Monument would also continue to be open to cross-country hiking, all forms of non-motorized trail access (e.g., equestrian and bicycle use), the launching and landing of drones, and other non-camping recreational activities not otherwise prohibited in law or regulation.

The BLM would continue to prohibit camping on land included in the ACECs at the south end of Lopez Island (Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay). Designated site camping managed in partnership with Washington State Parks would continue on Monument lands at Patos, Blind, and Posey islands. The remainder of the Monument would continue to be open to dispersed camping.

Non-BLM public land managers in the San Juan Islands generally have more restrictions on recreational use than those currently in place within the Monument (see Appendix E). The BLM has heard anecdotally that members of the public sometimes confuse un-signed Monument lands with other public lands. A small number of visitors would access and recreate on other nearby public lands that they mistook of Monument lands. This would be particularly challenging in instances where visitors mistake U.S. Fish and Wildlife Service rocks and islands that are closed to public access for Monument rocks and islands, which would continue to be open to recreation with few restrictions.

The continued availability of Monument lands for dispersed camping would perpetuate the potential for visitors to mistakenly camp on nearby public lands open only to day-use. Similarly, the continued availability of Monument lands for the discharge of firearms, equestrian and bicycle trail access, the launching and landing of drones, and other non-camping recreational activities not otherwise prohibited in law or regulation, could create management challenges for nearby public lands if these uses become popular. Under this alternative, the BLM would continue to lack clear management objectives and allowable and prohibited use decisions for the majority of Monument lands. This would continue to make it challenging to communicate clearly with the public about what uses are and are not allowed within the Monument as opposed to nearby non-BLM-administered public lands.

Alternative A

Under Alternative A, the BLM would facilitate public use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. This would be a more restrictive management approach than is in place on the great majority of public lands in the San Juan Islands.

Under this alternative, management of Monument rocks and islands would be similar to management of nearby U.S. Fish and Wildlife Service rocks and islands that are closed to public access. This would decrease the potential for visitors to mistakenly access closed areas of the National Wildlife Refuge.

The prohibition on recreation on Monument lands could cause confusion among visitors to nearby public lands that do provide recreational opportunities. This issue is likely to be most pronounced at Cattle Point (San Juan Island), where non-BLM-administered public lands are adjacent or in very close proximity to the Monument and visitors currently move freely between jurisdictions. The prohibition on recreation would have a substantial effect on nearby land managers at Cattle Point, including the National Park Service, San Juan County Land Bank, and WDNR. This alternative would disrupt current and past collaborative efforts to provide beneficial recreational experiences, facilities, and information. The disruption of access connectivity at Cattle Point would cause confusion and frustration for members of the public.

This alternative would also cause challenges for agencies that currently co-manage activities with the BLM. Washington State Parks, which currently manages camping within the Monument under a memorandum of understanding, would experience an economic revenue and recreational infrastructure investment loss due to the prohibition on camping at Blind, Posey, and Patos islands.

Under this alternative, the prohibition on recreational use could cause confusion for visitors to nearby and adjacent publicly accessible lands, particularly at Cattle Point. As opposed to under the No Action Alternative, the RMP would provide clear management objectives and allowable and prohibited use decisions. This would make it easier for the BLM to mitigate this confusion by communicating clearly to the public about what uses are and are not allowed within the Monument.

Alternative B

Under Alternative B, all but 10 acres of the Monument would remain open to recreational use and would be designated as RMAs. The BLM would prohibit recreational use of 10 acres categorized as Category A Rocks and Category B Rocks.

Under this alternative, management of Monument rocks would be similar to the management of nearby U.S. Fish and Wildlife Service rocks that are closed to public access. This would decrease the potential for visitors to mistakenly access these areas. Recreational use would still be allowed on Monument islands, continuing the potential for visitors to mistakenly access similar U.S. Fish and Wildlife Service islands on which recreation is prohibited.

Within the Monument, 726 acres would be managed for dispersed camping with a permit. This could create the potential for visitors to mistakenly access nearby public lands on which camping is not allowed, though the requirement of a permit associated with a specific Monument location should minimize this confusion.

Under Alternative B, the BLM's prohibition of, drone operation and bicycle trail access on Monument lands could lessen the potential for visitor confusion compared to the No Action Alternative. These activities are currently prohibited on most public lands adjacent or in close proximity to the Monument.

Alternatives B and C would have the recreation management approach most consistent with nearby non-Monument public lands, although discrepancies with some nearby management approaches would continue. As opposed to under the No Action Alternative, the RMP would provide clear management objectives and allowable and prohibited use decisions. This would make it easier for the BLM to mitigate this confusion by communicating clearly to the public about what uses are and are not allowed within the Monument.

Alternative C

Under Alternative C, all but 7 acres of the Monument would be open to recreational use. The BLM would prohibit recreation on Category B Rocks.

Under this alternative, management of Category B Rocks would be similar to management of nearby U.S. Fish and Wildlife Service rocks that are closed to public access. This would decrease the potential for visitors to access these areas mistakenly. Recreational use would still be allowed on islands and Category A Rocks, continuing the potential for visitors to mistakenly access similar U.S. Fish and Wildlife Service islands and rocks on which recreation is prohibited.

Under this alternative, the BLM would allow camping only in existing designated sites. This would minimize the potential for visitors to mistakenly camp on nearby public lands that are day-use only. The requirement on Monument lands for members of the public to obtain a permit to operate a drone, the designation of specified trails for equestrian access, and the prohibition of bicycle trail access, could lessen the potential for visitor confusion compared to the No Action Alternative. The BLM would prohibit firearm discharge on the majority of the Monument (612 acres) for approximately half of modern

firearm and muzzleloader deer hunting seasons.[56] Since the majority of public land managers in the San Juan Islands do not allow the discharge of firearms (whether for hunting or other purposes), there would continue to be potential for confusion among visitors to nearby and adjacent lands.

Alternatives B and C would have the recreation management approach most consistent with nearby non-Monument public land, although discrepancies with some nearby management approaches would continue. As opposed to under the No Action Alternative, the RMP would provide clear management objectives and allowable and prohibited use decisions. This would make it easier for the BLM to mitigate this confusion by communicating clearly to the public about what uses it would or would not allow within the Monument.

Alternative D

Under Alternative D, the entire Monument would remain open to the public for recreational purposes. Permits for recreational use would only be required for organized groups and for commercial or competitive recreational activities (as in all alternatives).

The BLM would continue to allow recreational use on Monument islands and rocks, perpetuating the potential for visitors to mistakenly access similar U.S. Fish and Wildlife Service islands and rocks on which recreation is prohibited.

The BLM would also continue not to prohibit dispersed camping, discharge of firearms, the launching and landing of drones, and leashed pets throughout all or some of the Monument (see Recreation and Visitor Services Issue 1). This would perpetuate the potential for confused visitors to participate in these activities on nearby public lands that do not allow them. The BLM would also allow equestrian and bicycle access on a limited number of designated trails. While the BLM would appropriately sign trails open to these uses, this could create confusion among visitors accessing nearby public lands that do not allow these uses.

Under this alternative, the BLM's approach to recreation management would be less restrictive than most other nearby public land managers. As with the No Action Alternative, this would perpetuate the potential for visitors to mistakenly access nearby public lands for uses to which they are closed. As opposed to under the No Action Alternative, however, the RMP would provide clear management objectives and allowable and prohibited use decisions. This would make it easier for the BLM communicate clearly to the public about what uses it would and would not allow within the Monument.

Conclusion

The alternatives vary in the extent to which the visitor uses the BLM would allow or prohibit would be consistent with the visitor uses nearby public land managers allow or prohibit. Each nearby and adjacent public land manager has its own approach to managing public access (see Appendix E); because of this, aspects of the BLM's management will be inconsistent with some recreation management approaches regardless of the alternative.

Under the No Action Alternative and Alternative D, the Monument would continue to be open to a variety of uses that some or most nearby public land managers prohibit (e.g., dispersed camping). Under Alternative A, the BLM would institute a substantially more restrictive approach to visitor management than is currently in place on the great majority of public lands in the San Juan Islands. Alternatives B and C would have the most consistent recreation management approach to nearby and adjacent Monument lands, although discrepancies with some nearby management approaches would continue.

Under all action alternatives, as opposed to under the No Action Alternative, the RMP would provide clear management objectives and allowable and prohibited use decisions. This would make it easier to communicate clearly to the public about what uses it would and would not allow within the Monument.

[56] The BLM would work with DFW to coordinate when the closure would not apply. A similar approach is currently implemented at Lopez Hill, which is managed by the San Juan County Land Bank. Lopez Hill is the only non-Monument public land on Lopez Island that allows hunting. Hunting is allowed on Lopez Hill for one half of the hunting season: https://lopezhill.org/hunting-on-lopez-hill/

Scientific Research

Key Points

- All action alternatives would require that researchers obtain written approval from the Monument Manager before conducting research in the Monument as a means to reduce conflict, redundancy, and potential impacts to the Monument's ecological and cultural values.

This section contains one analytical issue:

1. How would the alternatives affect the use of the Monument for scientific research? (page 191)

Scientific Research Analytical Issue 1: *How would the alternatives affect the use of the Monument for research?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Proclamation 8947 describes the Monument as "a refuge of scientific and historic treasures and a classroom for generations of Americans" and repeatedly refers to the scientific importance of, and scientific interest in, the Monument's ecological and cultural values.

Numerous research activities have taken place on BLM-administered lands in the San Juan Islands both prior to and since the Monument's designation in 2013. Research within the Monument has included projects undertaken by citizen scientists, non-profit organizations, universities and university-affiliated researchers, and Tribal, Federal, State, and local agencies. External parties, rather than the BLM, have generally proposed and conducted research. Research topics have included plants and wildlife, cultural resources and cultural landscapes, maritime history, mollusks, fire history, wildland-urban interface, insects and pollinators, natural ambient sound, plastic and marine debris, and intertidal and nearshore habitats. The research sought by and shared with the BLM has helped the agency and its partners to better understand the Monument and the San Juan Islands as a whole.

The BLM currently only requires authorization for research on the Monument where law or BLM policy requires a permit or other form of authorization. The BLM currently has a limited ability to monitor the impacts of research on the Monument or to reduce potential conflicts between research different projects or between research and other uses of the Monument. The lack of a general authorization requirement also limits the BLM's ability to ensure that research is taking place consistent with Department of the Interior and BLM policies related to research and science (see below).

Effects of the Alternatives

No Action Alternative

Under the No Action Alternative, scientific research would continue to take place within the Monument. Authorization from the Monument Manager would only be required where law or BLM policy requires a permit or other form of authorization. Under this alternative, research would continue at a similar rate as has occurred in the past. The BLM would continue to have a limited ability to monitor the impacts of this research on the Monument or to reduce potential conflicts between research different projects or between research and other uses of the Monument.

Under this alternative, researchers would continue not to be required to provide the BLM with an electronic copy of all final reports and papers resulting from research conducted within the Monument. This would limit the BLM's ability to apply research to Monument management and to share results, as appropriate, with the public.

Alternatives A, B, C, and D

Under the action alternatives, the BLM would continue to support and authorize scientific research within the Monument undertaken by citizen scientists, non-profit organizations, universities and university-affiliated researchers, and Tribal, Federal, State, and local agencies. The BLM would require authorization from the Monument Manager for all research, including any collection of materials from the Monument for scientific purposes. This would ensure that research within the Monument complies with the Department of the Interior's handbook on the Integrity of Scientific and Scholarly Activities (DOI

2014), the Implementation Strategy for Advancing Science in the BLM (Kitchell et al. 2015) and the National Landscape Conservation System Science Strategy (BLM 2007a). Under all action alternatives, the BLM would develop a science plan for the Monument.

This requirement for authorization would allow the BLM to monitor the impacts of research on the Monument and reduce potential conflicts between different research projects and between research and other uses of the Monument. The BLM could also prioritize research that would enhance the effectiveness of its management of the Monument's cultural and ecological values. Under the action alternatives, the Monument Manager would only authorize destructive sampling (i.e., any procedure that causes permanent change to the sampled material) of Monument ecological and cultural values where: a) it is the only viable method for conducting the research, and b) the research is expected to answer critical questions that would benefit the long-term protection of the values.

Under all action alternatives, researchers would also be required to provide the BLM with an electronic copy of all final reports and papers resulting from research conducted within the Monument. This would improve the BLM's ability to apply research to Monument management and to share results, as appropriate, with the public.

Under these alternatives, the number of research projects taking place within the Monument would decline. The need to obtain approval would deter some researchers. It is also likely that the BLM would not approve all projects in order to reduce conflicts and prioritize research to enhance understanding and protection of the Monument's cultural and ecological values. In these cases, displaced researchers could find other opportunities across the San Juan Islands outside of the Monument.

The authorization requirement would benefit researchers who obtained a permit by limiting conflict between different research projects. It would also benefit researchers interested in developing a better understanding of the Monument's cultural and ecological values. This requirement would also benefit the BLM's ability to effectively manage and limit impacts to the Monument's cultural and ecological values.

Conclusion

As compared to the No Action Alternative, alternatives A, B, C and D would reduce conflict, redundancy, and potential impacts to the Monument's ecological and cultural values. Under these alternatives, the rate of research would decline compared to the No Action Alternative.

Cumulative Effects of the Alternatives on Research in the San Juan Islands

The No Action Alternative would have no impact on the current opportunities for research in the San Juan Islands. The action alternatives could slightly reduce the number of research projects undertaken in the San Juan Islands by requiring that researchers obtain authorization from the Monument Manager. The Monument includes approximately 4 percent of public lands in the San Juan Islands (See Table 30 on page 147), so this would have a very modest impact on scientific research in the area as a whole.

Socioeconomics

Key Points

- San Juan County has a strong tourism-based economy. The Monument's main economic effect is in attracting visitors. Visitors come to the San Juan Islands for a variety of reasons, including many unrelated to the Monument. There is no reliable estimate of the Monument's economic contribution.
- The Monument provides non-market resources (benefits to wildlife and fisheries, air quality, cultural resources, etc.). These are resources that the public values, but not bought or sold through markets.
- Residents of the San Juan Islands have a high quality of life by a number of measures. They value natural space, hiking trails, shoreline access, wildlife viewing, and land conservation and stewardship. Residents are working to ensure that tourism is socially and environmentally sustainable.
- The main way that the BLM influences the quality of life for local communities is through provision of recreational opportunities that provide a variety of experiences and benefits, and through

opportunities for shared stewardship of Monument lands and resources through volunteering and other forms of partnerships.

- The BLM did not identify any environmental justice populations living within the planning area, but regional Native American populations have a variety of strong ties to the islands that this document evaluates from an environmental justice perspective.

This section contains three analytical issues:

1. How would the alternatives affect economic activity in the planning area derived from BLM-administered lands? (page 193)
2. How would the alternatives affect the quality of life for local communities in the planning area? (page 197)
3. Would the alternatives result in environmental justice impacts? (page 202)

The great majority of the Monument lands are within San Juan County (see Table 2 on page 2) so this document uses the county as the socioeconomic planning area. San Juan County, which is surrounded by water, is composed of the San Juan Islands and encompasses about 180 square miles. Residents and visitors can access San Juan County, and the Monument, only by boat or air. For further background information, see the Socioeconomic section of Appendix E.

Socioeconomic Analytical Issue 1: *How would the alternatives affect economic activity in the planning area derived from BLM-administered lands?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The Monument has a very minor direct economic role in the county. The BLM makes payments in lieu of taxes to the county to compensate for tax revenues not received from Federal lands, as well as additional funds authorized by the Emergency Economic Stabilization Act of 2008 (Public Law 110-343). Due to the small amount of BLM-administered lands in the county, recent payments have totaled less than $1,000 annually, about 1/5 of the total payments received by the county from the Federal government.

The BLM also makes a direct contribution through employment and by spending dollars on project-related goods and services. In addition to two full-time employees currently living and working in the islands, seasonal staff work and live in the area.

The Monument encompasses a small percentage of both the overall land (<1 percent), and the land available for public visitation (~4 percent) in the San Juan Islands. It represents a majority (53 percent) of the publically available land on Lopez Island (see Table 30 on page 147).

Despite its relatively small size, the Monument is important to local communities and a draw for seasonal visitors to the islands. In 2014, the BLM and its partners counted over 100,000 visitors to the Monument. The Monument provides a variety of recreational opportunities to visitors and residents and is a primary provider of such opportunities on Lopez Island (see the Recreation section). These opportunities support the lifestyle beloved by the local residents and are a draw for visitors. The BLM assumes that these opportunities enhance the consumer surplus experienced by visitors to the San Juan Islands.

Most non-resident visitors to the Monument are likely to also visit non-Monument lands while in the San Juan Islands. The Monument does receive substantially more visitation during the summer, however, indicating that these lands play some role in the seasonal tourism economy. The National Park Service estimates that the San Juan Island National Historic Park's 266,717 visits in 2011 generated about $17 million in non-local visitor spending, creating 235 jobs, and nearly $6 million in income (Cui et.al. 2013).

Through its management, the BLM also contributes to non-market values including ecosystem services. Other Chapter 3 sections describe contributions to air quality, habitat and plants, protection of historic and archaeological sites, and fish and wildlife.

What is consumer surplus?
Consumer surplus is a measure of economic value. It describes the amount an individual would be willing to pay to participate in an activity or experience beyond the actual cost. For example, a visitor to the islands might pay for the ferry and lodging. If the individual has a wonderful experience in the islands, he or she might experience a high level of value compared to these costs, i.e., have a high level of consumer surplus.

Effects of the Alternatives

No Action Alternative

The No Action Alternative and Alternative D would provide the most opportunities for recreational activities within the Monument. Popular activities such as camping, hiking, and visiting Monument lands by boat would continue, as would other activities such as hunting with firearms and equestrian use. Although the BLM would continue not to manage any Monument lands explicitly for providing solitude and quiet, these opportunities would continue to be available throughout the Monument on less popular days and times for visitation. All trails in the Monument are currently open to all non-motorized uses.

The BLM assumes that current trends in Monument visitation would continue, so there would be no change in current patterns of economic activity. As stated above, there are insufficient data to quantify the BLM's contribution to overall economic activity associated with visitation to the San Juan Islands.

By having very limited restrictions on recreational activities, this alternative may have the greatest potential for conflict between visitors, which could lower the consumer surplus experienced by Monument visitors. For example, the BLM has heard from visitors who feel unsafe due to firearm-based hunting on Monument lands. Without some restrictions on use, conflicts and crowding could increase at key times and places. This would lower the quality of some visitors' experiences, thereby lowering the consumer surplus they associate with visiting the San Juan Islands.

Alternative A

Under this alternative, the BLM would prohibit recreational use on Monument lands, although it would authorize access for educational, scientific, cultural, and spiritual uses. Because the Monument encompasses only 4 percent of the publically available land in the San Juan Islands, this change would be unlikely to decrease current trends in visitation to the San Juan Islands in general. Thus, there would be no change in current patterns of overall economic activity. However, the effects of prohibiting recreation could decrease visitation levels to Lopez Island, where the Monument provides over half of the public lands, including Watmough Bay, the most heavily visited site in the Monument. Businesses that serve Lopez Island visitors could see a decrease in business, although the magnitude is difficult to estimate.

Non-resident visitors who have developed strong attachments to Monument sites and opportunities through recreation would no longer be able to have these experiences and benefits unless they could obtain authorization for educational, scientific, cultural, and spiritual purposes. This could result in lowering San Juan Islands visitors' consumer surplus. This alternative's radical change from existing conditions and the major departure from how the BLM manages all other national monuments under its administration would lead to public conflict and concern among visitors and residents alike (see Socioeconomic Issue 2).

The consumer surplus for those participating in educational, scientific, cultural, and spiritual activities could increase under this alternative. The quality of these visitors' experiences could increase because

they would not have to compete with recreational visitors and would have greater opportunities for solitude, as well as encountering reduced environmental effects of human use.

Management partners, including Federal, State, and local agencies and non-governmental organizations, could experience increased costs due to the displacement of Monument recreational visitors under this alternative. This visitor management approach could pose challenges to partnership that are crucial to effective management of the Monument. Washington State Parks, which currently manages camping in the Monument under a memorandum of understanding, would experience an economic revenue and infrastructure investment loss due to the prohibition on camping at Blind, Posey, and Patos islands.

Alternative B

Under Alternative B, all but 10 acres of the Monument would remain open to recreational use and would be designated as RMAs (Monument rocks would be closed to recreational use). The BLM would facilitate recreational hiking and manage for quiet and solitude by dispersing users on the increased number of trails and managing some areas, including recreational boat landing on some shorelines, for permit-only recreation. Existing designated site camping would continue; the BLM would allow dispersed camping on much of the Monument but would use permits to ensure solitude and quiet by allowing only one small group per site. The BLM would prohibit equestrian and bicycle access.

As with other alternatives, the BLM would expect the current trends in visitation to the San Juan Islands in general and to Monument sites specifically to continue under this alternative. Therefore, the economic activity associated with the Monument would remain approximately the same as under the No Action Alternative. Some visitors' consumer surplus could increase and some decrease, depending on the type of experience desired.

The introduction of recreational permits for some areas and activities would be a change. Permit requirements would apply mainly to areas where use is currently low, so would not be expected to change use levels in the Monument. The consumer surplus for those participating in permitted uses could increase, because visitors would have greater opportunities for solitude and quiet. The requirement for permits for recreational boat landing in many less visited areas, coupled with the prohibition of recreational boat landing at Watmough Bay, would lower the consumer surplus for some visitors. Based on BLM and volunteer monitoring, approximately half of all visitors to the Monument arrive via boat.

Alternative C

All but 7 acres of the Monument would be open to recreational use and would be designated as RMAs. The BLM would close 3.6 miles of trail under this alternative, resulting in a 25 percent decrease in trail access compared to the existing network. The BLM would designate some trails for equestrian access, though fewer trails would be open to this activity than under the No Action Alternative or Alternative D. The BLM would manage fewer opportunities by permit than under Alternative B. While existing designated camping would continue, the BLM would close the remainder of the Monument to dispersed camping. Participation in dispersed camping is currently very low, so non-resident visitors may not be affected by this closure because the current popular designated site camping opportunities would remain.

As with other alternatives, the BLM would expect current trends in visitation to continue. Therefore, the economic activity associated with the Monument would remain approximately the same as current levels, although the pattern of recreation use on BLM-managed lands would shift somewhat. Some visitors' consumer surplus could increase and some decrease, depending on the type of experience desired.

In keeping with this alternative's restoration theme, the BLM would restore/rehabilitate historic structures to their historic appearance, and allow rebuilding of historically present, but currently absent structures. This would create additional opportunities for educating visitors about the area's history.

The BLM would close areas with known conflict associated with hunting to the discharge of firearms except for half of the hunting season, preserving some opportunity for recreational hunting using firearms not available in alternatives A or B. The partial closure would not affect non-firearm-based hunting (e.g., bow hunting) or hunting by Coast Salish tribal members. This partial closure would have the greatest

effect on visitors to Lopez Island, where most hunting within the Monument occurs. The BLM does not have a reliable estimate of the magnitude of the effect this closure would have on local businesses.

Sub-Alternative C

The discharge of firearms closure under Sub-Alternative C would remove opportunities for hunting using firearms from the Monument, but would not affect opportunities for bow hunting or hunting by Coast Salish tribal members. This closure would have the greatest effect on visitors to Lopez Island, where the most hunting within the Monument occurs. The BLM does not have a reliable estimate of the magnitude of the effect this closure would have on local businesses. Other than this closure, the economic effect of Sub-Alternative C would be the same as under Alternative C.

Alternative D

Under this alternative, the BLM would manage for more recreational opportunities than any other alternative. The entire Monument would remain open to recreational use without a permit and would be designated as RMAs, with a range of expanded recreational opportunities including facilities and signage and a 54 percent increase in trail access. The BLM would allow equestrian and bicycle use on some trails, though fewer trails would be open to these uses than under the No Action Alternative. In areas designated as middle county under this alternative, the BLM would allow a higher level of facility and signage development compared to the back country designations in Alternative C.

The new recreational opportunities could attract more visitors to the Monument, but the BLM assumes that, as a whole, visitation to the San Juan Islands would follow existing trends. Therefore, the economic activity associated with the Monument would remain the same as under the No Action Alternative. Some visitors' consumer surplus could increase and some decrease, depending on the type of experience desired.

The increases in trail miles and, over the life of the plan, of designated campsites and visitor facilities would increase the consumer surplus for visitors seeking these opportunities. Some visitors would also experience a decrease in consumer surplus from the potential conflict between recreational uses. There would be a higher potential for visitor conflict due to multiple uses on trails under Alternative D than under alternatives A, B, and C, but less than under the No Action Alternative. Under this alternative, the whole Monument would remain open to the discharge of firearms. The BLM has heard from visitors who feel unsafe due to firearm-based hunting on Monument lands. As use increases, without some of the restrictions found in other alternatives, conflicts and crowding could increase at key times and places. This could lower the quality of some visitors' experiences and therefore their consumer surplus.

Conclusion

Regardless of the alternative selected, it is likely that BLM-related activities will continue to constitute a tiny percent of the local economy. The main economic effect of the alternatives would stem from how recreational use levels by non-resident visitors would change on both Monument lands and non-Monument lands. Although the Monument offers some unique recreational opportunities, it encompasses only 4 percent of the publically available land in the San Juan Islands. The BLM assumes that overall visitation levels to the San Juan Islands would remain about the same regardless of its approach to managing the Monument, leading to negligible changes in economic activity due to recreation.

The exception to this general finding is the effect on economic activity on Lopez Island, where the Monument provides 53 percent of the public lands available, including Watmough Bay, the most heavily visited site in the Monument. Therefore, the alternatives have the potential to have a greater effect on economic activity specific to Lopez Island.

Although the BLM assumes that overall levels of visitation to the San Juan Islands would follow existing trends under all alternatives, the alternatives would change the recreational opportunities available on the Monument and potentially the quality of visitors' recreational experiences. This in turn could affect recreation visitors' consumer surplus. Many of the repeat visitors returning to the islands have a strong sense of place, presumably for similar reasons as the people who live there; this group could be affected more than first-time or casual visitors. In addition, the alternatives would have distributive impacts based on peoples' preferences for recreation.

Cumulative Effects on Economic Activity in the San Juan Islands

In the San Juan Islands, there are an array of governmental agencies and non-profit organizations that provide approximately 23,882 acres of land available for a variety of recreation activities. The availability of publically accessible lands for outdoor recreation in a scenic setting is an important contributor to the attractiveness of the San Juan Islands as a tourism destination. Under all alternatives, non-BLM public and private recreation providers in the San Juan Islands would continue to conduct marketing efforts to attract visitors and the BLM expects existing trends in recreation to continue.

The BLM's small contribution to this economy would continue at its current rate under alternatives B, C, and D. Under alternative A, this small contribution would be withdrawn. Given the availability of other publically accessible lands in the San Juan Islands, this is would have a negligible impact on economic activity in San Juan County. However, because the Monument is a primary provider of publically accessible lands on Lopez Island this alternative would affect its desirability as a tourism destination.

Socioeconomic Analytical Issue 2: *How would the alternatives affect the quality of life for local communities in the planning area?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Residents of the San Juan Islands highly value open space, conservation of natural resources, recreational opportunities, and the atmosphere of island life (see Socioeconomics section in Appendix E). Monument lands and opportunities contribute to these values. While the Monument's overall contribution to publically accessible land in the San Juan Islands is small (~4 percent), it represents the majority of public lands on Lopez Island (53 percent) (see Table 30 on page 147).

Residents' uses of the Monument—as well as of other areas in the San Juan Islands—encompass a variety of experiences and benefits. For example, the experience of enjoying natural landscapes can lead to onsite benefits such as greater environmental awareness and sensitivity and to offsite benefits such as increased community stewardship of natural resources (BLM 2014b). During project scoping and the 2016 human use workshops, the BLM heard from local residents about the cultural importance to their community of the Monument lands on the south end of Lopez Island. In addition to comments describing the ongoing use of these lands by local residents for walking and other non-motorized forms of recreation, some commenters mentioned the use of the lands for community celebrations, overnight visioning retreats, naming ceremonies, and other cultural or spiritual purposes (BLM 2015b,c, BLM 2016a,b).

As described in the San Juan County Vision Statement (see Socioeconomics section in Appendix E), residents value stewardship and self-sufficiency. There is a long history of local collaboration with the BLM in conservation and management activities. A volunteer monitoring program established after the designation of the ACECs provides the BLM with information about visitation and resource condition on Lopez Island. Very active partner groups maintain interpretive materials and displays at Turn Point Light Station and Patos Lighthouse, with volunteers providing onsite information.

Partnerships are essential to the BLM's management of the Monument, with partners assisting with work including visitor management, monitoring, and historic structure restoration. The BLM works with diverse partners to provide educational and interpretive programs (See Education and Interpretation). It relies on a partnership with Washington State Parks to manage developed camping in the Monument.

The BLM has worked in consultation with tribal partners to reduce risks of cultural resource damage and to develop a better understanding of culturally important plants and the area's tribal heritage. Tribal partners have reported to the BLM that collaborative stewardship projects provide a means of helping tribal members, particularly youth, to engage with lands in their traditional territories.

In addition to providing opportunities for many types of recreation experiences and benefits, the Monument provides an opportunity for connection and engagement among residents, agencies non-profit organizations, and extremely dedicated volunteers. The Monument therefore contributes to community social cohesion, i.e., the extent to which a geographical place is a community in its shared values, cooperation, and interaction, and the extent to which people respond collectively to identify and reach

valued outcomes and to deal with collective economic, social, political, or environmental issues (Desjardin et al 2002). Volunteer organizations are a key component of social cohesion; volunteering is a way to meet people, develop relationships, and serve the community, often providing important service needs that could otherwise not be met (Desjardin et al 2002).

The Monument has likely contributed to community social capital as well as generating its own social capital within the community. Social capital is an asset like human capital or financial capital that is available for use by people who possess it; it is developed through relationships and social networks that are often characterized by social norms and levels of trust and it facilitates collective action for mutual benefit (Putnam 2000). Social capital is especially important to island communities because they are typically smaller, more isolated, and self-sufficient, so things go more easily when people are able to work together to define and achieve common goals.

Effects of the Alternatives

No Action Alternative

Residents would be able to continue to recreate on the entire Monument (subject to minimal current restrictions) without having to obtain a permit. Residents could continue to visit the Monument as they do currently, contributing to their lifestyle and the benefits gained from recreation experiences.

By having few limitations on recreational activities, this alternative would also have the greatest potential for conflict between visitors, particularly if there is an increase in participation over time in activities that are currently available but have low participation rates, such as bicycle use and dispersed camping. Increasing visitation and diversifying uses with limited management could potentially diminish the quality of experiences available in the Monument. Members of the public who expected to see additional protections to Monument objects from recreational impacts, or restoration of plant communities, could be disappointed that Monument designation did not lead to those changes. Comments to the BLM suggest that residents highly value recreational opportunities, but want to see them managed to avoid crowding and protect ecological and cultural values (BLM 2016a,b). The BLM received a variety of comments requesting more restrictive recreational management than is currently in place.

The BLM would continue to undertake very limited vegetation treatments in the Monument. As a result, residents and local organizations would have relatively little opportunity to participate in vegetation management activities as contractors, volunteers, or partners. On the other hand, recreation would not be as disrupted by vegetation management as under other alternatives.

Alternative A

Because the BLM would prohibit recreational use, local residents would no longer be able to recreate on Monument lands and would have to obtain authorization, through a process that would be determined during plan implementation, to visit for educational, research, cultural, or spiritual purposes.

The primary outcome would be a decline in the quality of life for San Juan Islands residents, especially those living on Lopez Island, where the Monument provides a larger share of many recreational opportunities. These negative effects would be stronger among residents than visitors because many Lopez residents have come to depend on Monument recreational opportunities as part of their lifestyle, and have developed a strong sense of place for Monument sites.

The requirement to obtain authorization for public access for one of the stated purposes would be a substantial impact to residents. One of the major sources of conflict regarding Federal recreation management occurs when a permit or other restricted entry system is enacted in a place where there has never been one (McCool 2001). The authorization system would facilitate research, cultural, educational, and spiritual purposes, though any authorization process could still create a barrier to use. The impact would depend to some extent on how easy or difficult it would be for residents to obtain access. Assuming the BLM approves some requests but denies others, this would create conflict among potential users and would increase tension between the community and the BLM.

Residents who value resource protection over recreational public use, or who could continue to access the Monument for the educational or research related activities they value, may benefit from this alternative.

Residents who participate in citizen science and monitoring would be able to continue these activities, which are valued among some local residents.

The lands on the south end of Lopez Island are culturally important to members of the local community, as expressed in an array of feedback received by the BLM during the scoping period for this planning process. This would make the problem discussed above—distinguishing between authorized uses and recreation—especially difficult for Lopez Island and other residents. There would be conflict over what constitutes an authorized purpose for a visit given the culture and values of San Juan Islands residents.

The BLM estimates that meeting the vegetation objectives for this alternative would require a low level of vegetation management (an average of 52 acres per year). This would cause minimal disruption to authorized human uses and residents, but would also present less opportunity for local hires, volunteer involvement, and active partnerships with conservation organizations. The BLM would not allow the use of chemical treatments or prescribed fire; the BLM has received comments from local residents expressing concern over the application of chemicals and prescribed fire within the Monument.

Alternative B

Residents would continue to be able to access all but 10 acres of the Monument for recreational purposes. As under alternatives C and D, the recreational activities most residents are currently participating in would continue to be available. This alternative's emphasis on hiking and quiet and solitude appears consistent with many San Juan Island residents' values and preferences for recreation settings as expressed by some public comments (BLM 2016a,b).

Lopez Island residents who currently use Monument trails for equestrian use would no longer have access to this opportunity under Alternative B. Given the limited availability of equestrian trails on Lopez Island, this could have an impact on these residents' quality of life. Residents who have expressed a desire to limit Monument trails to hiking would experience a decrease in potential conflict. As mentioned under Issue 1, recreation in certain locations would be available by permit only in order to provide opportunities for quiet and solitude. Recreational use in these areas is currently low use so residents may be able to obtain permits easily. Comments to the BLM suggest that many residents would support use limits in return for solitude experiences and protection of resources (BLM 2016a,b). Over time, the nature of the permit system, its rationale, whether it is perceived as fair, the ease of obtaining a permit, and other details would likely shape residents' acceptance of the system.

As was described under Socioeconomic Issue 1, the prohibition of recreational boat landing at Watmough Bay would constitute a social impact to residents who land boats at that site. Residents who regularly take advantage of this opportunity may not have readily available substitute sites.

The BLM estimates that it would require a relatively large amount of vegetation treatment to achieve Alternative B's vegetation objectives (an average of 584 acres per year[57]). These treatments would periodically disrupt human use and occasionally nearby residences. This level of management would also create opportunities for residents to work cooperatively with the BLM as volunteers, contractors, or partners. Members of the public would have the opportunity to comment on the design of treatments during plan implementation.

The goal of enhancing the San Juan Islands' ecological resistance and resilience by increasing the extent of native plant communities—specifically grasslands and wetlands—that are relatively scarce within the San Juan Islands as a whole appears consistent with many residents' values. However, this alternative would result in the second greatest change from existing conditions, so some residents would likely be uncomfortable with far less forest vegetation than they see at present in the Monument.

Alternative C

Residents would be able to continue to access all but 7 acres of the Monument for recreational purposes. As under alternatives B and D, the recreational activities most residents are currently participating in

[57] In many cases, the described treatments would take place on the same acres of land. For example, mechanical or manual treatments to remove woody shrubs and subsequent planting of native plants would be likely to take place in the same area.

would continue to be available. The long-standing use of trails on Lopez Island for equestrian use by a small number of local residents would continue. Camping at existing designated sites would remain but the BLM would close the rest of the Monument to camping. Assuming that residents are less likely to camp, they could benefit from reduced impacts and fewer potentially conflicting uses.

The BLM would close areas with known conflict around hunting to the discharge of firearms except for half of the hunting season, preserving some opportunity for recreational hunting using firearms not available in alternatives A or B. The partial closure would not affect non-firearm-based hunting (e.g., bow hunting) or hunting by Coast Salish tribal members. This partial closure would have the greatest effect on Lopez Island residents, where most hunting within the Monument occurs. Residents who reported conflict and safety issues associated with firearms would benefit from the removal of this potential conflict from their use of the Monument during approximately half of hunting season.

This alternative would also have the second greatest for potential disruption from vegetation treatments (an average of 887 acres per year[57]). This level of treatment would periodically disrupt human use and occasionally nearby residences. It would provide many opportunities for residents and others to become involved in vegetation management activities, increasing their sense of stewardship and level of collaboration with the BLM. Members of the public would have the opportunity to comment on the design of treatments during plan implementation.

The goal of approximating the extent and condition of plant communities that existed prior to European settlement could resonate with many residents, who would also likely agree with the goal of reducing the threat of high-severity wildland fire or other major disturbance events. However, this alternative, along with Sub-Alternative C, would result in the greatest change from existing conditions, so some residents would likely be uncomfortable with far less forest vegetation than they see at present in the Monument.

Sub-Alternative C

The discharge of firearms closure under Sub-Alternative C would remove opportunities for hunting using firearms entirely from the Monument. This closure would not affect non-firearm-based hunting (e.g., bow hunting) or hunting by Coast Salish tribal members. This closure would have the greatest effect on Lopez Island residents, where most hunting within the Monument occurs. Lopez Hill would be the only remaining public land on Lopez Island partially open to this use (Lopez Hill is open to hunting for approximately one half of regular deer hunting season). Residents who reported conflict and safety issues associated with firearms would benefit from the removal of this potential conflict.

The other objectives and direction under Sub-Alternative C are the same as Alternative C except that no chemical vegetation treatments would be allowed, which residents opposed to this use would favor. The prohibition on chemical treatments would require more repetition of mechanical treatments to achieve the alternative's restoration objectives. The BLM estimates that it would require the most acres of vegetation treatment under this alternative (an average of 1,712 acres of treatment per year[57]).

This alternative would cause the greatest disruption in human use from vegetation management though would also provide the greatest opportunities for residents and others to become involved in vegetation management activities, increasing their sense of stewardship and level of collaboration with the BLM. Members of the public would have the opportunity to comment on the timing, mechanism, and sequencing of treatments during plan implementation. The prohibition on herbicide use would also make it more difficult for the BLM to minimize invasive plant species occupying areas disturbed through vegetation treatments and along trail and roadsides.

Alternative D

Residents would continue to be able to access the entire Monument for recreational purposes without a permit. As under alternatives B and C, the recreational activities most residents are currently participating in would continue to be available. Residents of Lopez Island who currently participate in equestrian use on Monument trails, and those who are interested in using bicycles on Monument trails, would have the most trails explicitly designated for these uses under Alternative D (though this would still be a reduction in the total trail miles compared to those available under the No Action Alternative).

The recreation analysis noted that by allowing the most uses and opening up lands and opportunities for multiple forms of recreation, this alternative could result in higher levels of conflicts than the other action alternatives. Based on comments to the BLM, many residents could feel that this alternative does not restrict recreation use enough to protect the quality of the experience and the Monument's ecological and cultural values (BLM 2016a,b). Therefore, this alternative could create more social conflict than alternatives that include stronger restrictions on recreational use, and result in recreation settings that are more developed and crowded than residents prefer.

Monitoring could determine if this was becoming a problem and the BLM could undertake implementation-level actions to change trail designations or provide additional facilities as necessary in conformance with the Approved RMP. Assuming much monitoring would be citizen-based, this alternative would create additional opportunities for residents' participation and stewardship.

The vegetation goal would be to maintain the approximate 2016 extent and condition of plant communities while minimizing wildfire risks to human health and safety, property, and infrastructure. Residents who favor the status quo and minimizing disturbances associated with vegetation treatment may favor this approach. The BLM estimates that it would require an annual average of approximately 65 acres to accomplish this objective. This would be more vegetation treatments than the No Action Alternative and Alternative A. Compared with alternatives B and C, there would be fewer opportunities for residents to participate in vegetation management and associated stewardship activities, but this could be offset by the increased opportunities for recreation monitoring, interpretation, and visitor education.

Conclusion

The main way that the BLM influences the quality of life for residents is through provision of recreational opportunities. Another benefit is the opportunity to participate as volunteer monitors, citizen scientists, and similar roles that provide a sense of stewardship and collaboration.

Many residents of local communities, particularly on Lopez Island, regularly use the Monument and the opportunities it provides. These opportunities contribute positively to residents' quality of life, but the extent of this contribution relative to other public lands is not known. Alternatives that change these existing opportunities could affect the quality of life for residents who currently depend on them, as could alternatives that create or reduce social conflict, and how the alternatives align with residents' values.

As was the case with Issue 1, these effects could be magnified for Lopez Island residents, due to the Monument including 53 percent of the public land on their home island. The importance of the Monument to Lopez residents is also reflected by the fact that the Lopez Island workshop garnered the vast majority (77 percent) of comments received by the BLM during its four 2016 human use workshops.

Local residents are likely to favor, and view themselves as favorably affected by, alternatives that maintain the recreational opportunities that they value. This will vary among residents, but in general, many have expressed a desire to minimize crowding or impacts to ecological and cultural values. Thus alternatives A and D are the least likely to have positive effects on quality of life for many local residents. Alternatives B and C would maintain the activities most residents participate in while having more restrictions on recreation than Alternative D. All action alternatives would provide more opportunities for citizen engagement in vegetation management; alternatives B, C, and sub-C would have the most opportunities for engagement, but also the most potential for vegetation treatments to disrupt human uses.

Cumulative Effects on Quality of Life for Local Communities

As described under cumulative effects for Socioeconomic Issue 1, there are an array of governmental agencies and non-profit organizations that provide approximately 23,882 acres of land in the San Juan Islands for a variety of recreation activities. The availability of publically accessible lands for outdoor recreation in a scenic setting is an important contributor to the quality of life for residents. Under all alternatives, other public land managers in the San Juan Islands would continue to provide opportunities for residents to participate in outdoor recreation.

The Monument would continue to contribute to the quality of life of local residents under all alternatives, although the overall availability of public land for resident recreation in the San Juan Islands would

decrease by 4 percent under Alternative A. Given the availability of other publically accessible lands in the San Juan Islands, this is would have a negligible impact on economic activity in San Juan County. The availability of non-Monument public lands would ameliorate the alternatives' effects on quality of life with the possible exception of Lopez, where the BLM decisions would have a larger effect due to the larger BLM share of public recreational opportunities.

Socioeconomic Analytical Issue 3: *Would the alternatives result in environmental justice impacts?*

See Appendix B for analytical methods used in this analysis.

Background

Environmental justice refers to the fair treatment and meaningful involvement of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, programs, and policies. Executive Order 12898 requires Federal agencies to "identify and address the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

According to the Council on Environmental Quality's (CEQ) Environmental Justice Guidelines for NEPA (1997), "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." Low-income populations are those whose residents live at or below the poverty level.

Affected Environment

Based on the race and ethnicity proportions of the San Juan County population described earlier in this section, and on the poverty rate compared to the statewide rate, the county population as a whole does not meet the threshold for either minority or low-income status. See the Socioeconomics section of Appendix E for information on San Juan County's race and ethnicity demographics and poverty rate.

However, lower-income individuals and families do live in San Juan County. For example, as of May 2016, 43 percent of students in the San Juan Island School District received free or reduced-price meals, nearly the same as the statewide rate of 44 percent (Office of Superintendent of Public Instruction 2016). The Washington State Report Card also shows that there are minority students in the District; about 17 percent of students were Hispanic/Latino, although the proportion of White, non-Hispanic students in the District (75 percent) was much higher than the statewide rate (56 percent).

The long tradition of use and current interests in the San Juan Islands by Coast Salish tribes indicate that the BLM's management affects Native American communities associated with the Monument (see the Tribal Interests section on page 215 of this chapter). Thus, the BLM is considering negative impacts to tribal interests to be an environmental justice issue.

Effects of the Alternatives

The main purpose of this environmental justice analysis is to describe whether impacts to tribal interests, specifically to the Native American/Coast Salish tribes with ties to Monument lands, would be disproportionately negative and adverse compared to impacts to non-tribal populations. A secondary purpose is to describe beneficial impacts to tribes. This section relies on the analyses of impacts presented in the Tribal Interests section, along with tribal comments received on preliminary drafts of this document, rather than conducting new or independent analyses.

The Tribal Interests section assessed environmental consequences to tribal interests in two main ways. First, it assessed the impacts from recreation on cultural resources and traditional activities, including the exercise of treaty rights. Second, it assessed the positive and negative effects of vegetation management on tribal interests. The analysis found that recreational use can affect tribal interests and uses in several ways. Recreational use and access can affect the integrity of sites, locations, or resources identified as important to tribes. Recreational use can affect cultural sites through disturbance, soil compaction, altered surface water drainage, erosion, intrusions to the setting, and unauthorized collection or

vandalism. Actions that affect access or interfere with the exercise of traditional cultural uses and practices also can harm cultural resource values and treaty protected activities. Opening areas to new or increased access and use can increase risk to previously undisturbed and fragile resources from intentional or unintentional damage and loss.

Vegetation management can have both positive and negative effects on tribal interests and uses. Disturbance from vegetation treatments can damage cultural resources. Vegetation treatments that change a cultural or natural setting, including visual and aural intrusions, or that concentrate activities in areas important for spiritual or other traditional practices can affect tribal interests. However, if vegetation treatments are not implemented, noxious weeds and invasive plants would continue to increase, forest health and wildlife habitats would continue to decline and encroachment of grasslands and shrublands would continue, contributing to long term impact on the historic setting, availability of plants for gathering, and other traditional uses and exercise of treaty rights. Alternatives having greater amounts of vegetation management also would create desired opportunities for the tribes to be involved in those activities.

Effects Common to All Alternatives

As described in the Tribal Interests section, the BLM would address potential impacts to tribal interests, including effects to cultural sites and traditional cultural practices, at the design or implementation phase of future projects through consultation with affected tribes along with National Historic Preservation Act Section 106 review. The BLM, in consultation with affected tribes and in consideration of tribal interests and treaty rights, would avoid, minimize, or mitigate potential impacts on historic properties. Consultation and identification of potential impacts to tribal interests prior to project implementation would reduce adverse impacts to tribal interests.

Under all alternatives, the BLM would collaboratively engage with tribal government partners to facilitate traditional uses, develop opportunities for co-stewardship of plant communities and culturally important plants, engage tribal youth and elders, and maintain and improve access for exercise of treaty rights and traditional cultural practices. Through engagement with the tribes, the BLM would foster programs to enrich opportunities for tribal cultural, spiritual, and educational activities including projects to restore Salish place names within the Monument.

Under all action alternatives, the BLM would prohibit several recreational activities that could disturb, damage, alter, or destroy important objects and values of cultural significance for which the Monument was designated. The BLM would undertake temporary closures as necessary to protect the Monument's ecological and cultural values, as well as sensitive tribal activities. Recreational use would vary by alternative but access for tribal use and exercise of treaty rights would be available under all alternatives. Opportunities for solitude and quiet would continue to be available in the Monument at certain times and seasons under all alternatives.

No Action Alternative

Under this alternative, the public would be able to continue to recreate on the entire Monument (subject to minimal current restrictions) without having to obtain a permit. The Tribal Interests analyses found that measures to reduce impacts to sites would continue but the potential for impacts from use and maintenance would grow if visitation continues to increase over time. Increased visitation could contribute to increased disturbance to cultural and natural resource sites and increased intrusion into locations for traditional and cultural practices. Use of trails would continue to have direct short-term and long-term impacts on cultural sites and other cultural properties crossed or accessed by trails, through soil compaction, erosion via channeling of water, and widening of trails during wet periods

The No Action Alternative would have the least risk of any alternative for vegetation treatments to disturb cultural resources. Conditions for culturally important plants would continue to decline and there would continue to be few opportunities for tribes to work with the BLM on vegetation treatments.

Alternative A

This alternative would minimize impacts to cultural sites and traditional use from visitation to a greater extent than any other alternative. Opportunities for traditional and cultural practices requiring solitude

and quiet would increase and tribal enrichment programs and engagement would likely increase due to the reduction in potential conflicts from visitor uses under this alternative. Traditional uses of cultural properties would continue and potentially increase over the life of the plan.

While slightly greater than the No Action Alternative, Alternative A would have a low risk for vegetation treatments to disturb cultural resources. Conditions for culturally important plants would continue to decline and there would continue to be few opportunities for tribes to work with the BLM on vegetation treatments.

Alternative B

Under Alternative B, all but 10 acres of the Monument would remain open to recreational use. The impacts from recreation described under the No Action Alternative would not continue at sites closed to recreation, though minor impacts from access for administrative and authorized uses would continue. To provide opportunities for solitude and quiet, 167 acres of the Monument would be open for recreation by permit only, which would reduce impacts by limiting the amount of recreation in those areas.

Authorizing new trail routes would increase potential impacts to cultural sites and areas for traditional cultural uses. The BLM would consult with affected tribes and conduct cultural resource surveys of the proposed designated trail routes prior to implementation. Rerouting trails to avoid cultural sites and places important for traditional cultural practices would reduce potential impacts to tribal interests. Limiting access to designated trails except for authorized uses would reduce impacts to cultural sites and places important for traditional cultural practices outside of the designated trail routes.

The magnitude and intensity of the vegetation control and restoration measures under Alternative B would create a relatively high potential for impacts to cultural resources from disturbance, chemical treatments, and fire. The potential for damage or destruction of archaeological or cultural sites and properties from vegetation treatments would be greater under this alternative than under the No Action Alternative, Alternative A, and Alternative D. Alternative B also would substantially increase the quantity and quality of grassland and shrubland plant communities within the Monument. This would increase opportunities for both collecting culturally-important grassland plants, such as camas, and for tribes to work with the BLM to implement vegetation treatments.

Alternative C

The BLM would expect this alternative to reduce impacts from recreation to cultural sites or places of importance for traditional cultural activities more than any alternative except A. Development of educational and interpretive signs and visitor facilities focusing on tribal history and enrichment (e.g., a longhouse) could benefit tribal interests by informing and enhancing the public's understanding of the tribal heritage associated with the Monument. The BLM would close 3.6 miles of existing trail and would prohibit camping outside of existing designated campsites. Rerouting trails to avoid cultural sites and places important for traditional cultural practices would reduce potential impacts to tribal interests. Limiting hiking to designated trails except for authorized purposes would reduce the potential for impacts to cultural sites and places important for traditional cultural practices.

Impacts from vegetation treatments under Alternative C would be similar to under Alternative B, though the magnitude of both negative and positive impacts would be greater. Alternative C, along with Sub-Alternative C, would go the furthest toward approximating pre-Euro-American settlement vegetation conditions and would provide the most opportunities for gathering of grassland plants. It would also provide many opportunities for tribes to work with the BLM to implement vegetation treatments.

Sub-Alternative C

Potential impacts to cultural sites from vegetation management would be highest under Sub-Alternative C. Without the use of herbicides, the BLM estimates that it would need to increase the repetition of mechanical treatments to meet the vegetation objectives (see Table 20 on page 115). Along with Alternative C, this alternative would go the furthest toward approximating pre-Euro-American settlement vegetation conditions within the Monument and would provide the most opportunities for gathering of grassland plants. It would also provide many opportunities for tribes to work with the BLM to implement vegetation treatments.

Alternative D

Opportunities for traditional and cultural practices requiring quiet and solitude likely would decrease under this alternative and conflicts with recreational activities would likely affect tribal enrichment programs and engagement. Opening areas currently closed to dispersed camping would increase the potential for long-term and direct impacts to cultural resources and places important for traditional cultural uses in these areas. However, development of educational and interpretive signs and visitor facilities focusing on tribal history and enrichment (e.g., a longhouse) could benefit tribal interests.

While greater than the No Action Alternative and Alternative A, Alternative D would have a substantially lower risk for vegetation treatments to disturb cultural resources than alternatives B, C, and Sub-C. The condition of areas of traditional cultural importance for plant gathering and use would remain relatively unchanged though conditions in forests and woodlands would continue to be mostly closed and crowded. It would also create fewer opportunities for tribes to work with the BLM to implement vegetation treatments than under alternatives B, C, and sub-C.

Conclusion

Appendix D of the BLM's Land Use Planning Handbook specifies that the BLM should assess environmental justice impacts in part through collaboration with affected populations. The avenue for that collaboration in this process is through government-to-government consultation and involvement of tribes as cooperating agencies.

To date, the BLM has received formal, written comment assessing the alternatives from several Native American/Coast Salish tribes including the Tulalip Tribes of Washington (a Cooperating Agency for development of the RMP/EIS), the Swinomish Indian Tribal Community, and the Suquamish Tribe.

Letters and comments received from tribes to date generally strongly support Alternative A, modified with Alternative C's emphasis on restoring fire-dependent native grasslands. Some comments also make the point that recreation was not an object identified in Proclamation 8947 and describe a serious concern with current and increasing recreational pressures on sensitive spiritual and cultural sites, though tribal representatives have not identified specific sites.

The BLM assumes that Alternative A would have beneficial effects on tribes as an environmental justice population, although its low level of vegetation management activities could be a concern. The No Action Alternative and Alternative D, which would accommodate the highest levels of recreational use, would constitute a negative effect on tribes as an environmental justice population. Alternatives B and C allow recreational use, but likely at lower levels and incorporating management actions that would minimize many of the associated negative effects. Alternatives B and C also provide the greatest opportunities for tribes to be involved in vegetation management activities, as well as creating environments conducive to many tribal uses. Therefore, the BLM assumes that these alternatives would not result in disproportionately negative effects to tribes.

The issue for environmental justice is whether the negative impacts under the No Action Alternative and Alternative D would disproportionately affect tribes compared to other populations. The recreational analysis concluded that the No Action Alternative and Alternative D generally provide the most opportunities for recreational activities within the Monument, which would continue to be open to a variety of uses that nearby non-BLM land managers prohibit (e.g., dispersed camping).

The recreational analysis also concluded that by supporting a wider range of recreational activities, the No Action Alternative and Alternative D would have the greatest potential for conflict between visitors. This is true for tribes as well as other populations. In addition to the potential levels of conflict shared with other Monument users, other experiences of tribes would be at increased risk due to their unique connection to these lands and resources described in the Tribal Interests section. That analysis found that the limited land available for the practice of traditional cultural activities within the San Juan Islands makes the availability of Monument lands particularly important to tribal interests.

The No Action Alternative and Alternative D call for low levels of vegetation management, providing few opportunities for tribes to be involved in vegetation management activities, and not creating

environments conducive to many tribal uses. The Tribal Interests section concluded that the No Action Alternative and Alternative D would provide minimal benefits to plant communities important for many traditional cultural practices.

Therefore, the impacts to tribes under the No Action Alternative and Alternative D are considered disproportionately negative to tribes as an environmental justice population.

Soils

Key Point

- The BLM should manage soils in all alternatives to maintain or achieve unimpaired function(s) associated with their designated use(s).
- Under alternatives B and C, the magnitude and extent of short-term soil disturbances from vegetation management activities would be greater.
- Under alternatives B and D, more soils within the Monument may continue to have more limited function due to the establishment and use of trails.

This section contains one analytical issue:

1. How would the alternatives' management of human uses and vegetation affect soil stability and sediment-based water quality issues? (Page 206)

Soils Analytical Issue 1: *How would the alternatives' management of human uses and vegetation affect soil stability and sediment-based water quality issues?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The great majority of the Monument is within San Juan County (see Table 2 on page 2). The BLM is using the U.S. Department of Agriculture's Natural Resources Conservation Service's (NRCS) soil data for San Juan County to describe soil types within the Monument. The San Juan Islands' soils are primarily formed from glacial drift mixed with colluvium from metasedimentary bedrock, glacial drift, or glacial drift over dense glaciomarine deposits. There are three dominant soil orders in the Monument; Inceptisols comprise approximately 80 percent, while Mollisols and Alfisols comprise approximately 10 percent each. The soils in the San Juan Islands generally have a relatively warm soil temperature regime and mixed (i.e., isotic) mineralogy. They are generally moist in the winter and dry in the summer with several smaller soil inclusions that are moist to wet for a majority of the year (NRCS 2016).[58] For more information about soil orders within the Monument see the Soils section in Appendix E.

Areas of highly erodible soils occur throughout the San Juan Islands. The NRCS categorizes soils by both their susceptibility to water erosion and their susceptibility to wind erosion. Areas with higher erosion potential ratings are more vulnerable to soil loss following vegetation removal or other ground disturbing activities unless mitigation measures are taken.

The NRCS rates soils formed on steep slopes with grades of 30 percent or more and having textures of loam, silt loam, and some sands as having a high water erosion hazard rating (severe or very severe). Soils without exposure, those covered with vegetation, and non-erodible surfaces like rock, have lower water erosion hazard ratings. The NRCS rated approximately 67 percent of the Monument as having severe water erosion potential. It rated 25 percent of the Monument as having moderate water erosion potential (NRCS 2016).

The NRCS categorizes soils into wind and hydrologic erodible groups, with the soils with the greatest susceptibility to wind erosion in Group 1, and the soils with the least susceptibility to wind erosion in Group 8. Wind erosion can result in the displacement or loss of topsoil, increased sediment deposition, and impacts to ambient air quality from elevated dust levels. Soils within the Monument range from

[58] The complete description of soils and conditions within the counties can be found at the Natural Resources Conservation Service's Soil Survey Website: websoilsurvey.nrcs.usda.gov

Group 2 to Group 8, with most in Group 4 (NRCS 2016). Approximately 10 percent of the mapped lands are in Group 2 (NRCS 2016).

Deep loamy soils are important features for wildlife, particularly for fossorial species (i.e., species that burrow) such as the Shaw Island Townsend's vole. The majority of soils within the Monument are less than 36 inches in depth, which is relatively shallow compared to mainland soils described by the NRCS, which may exceed 60 inches in depth (NRCS 2016). Due to the soils' glacial origin, there is a restrictive layer found at ten or fewer inches beneath the surface. The restrictive layer can impede movement of water, as well as some roots and animals, deeper into the soil. Some exposures of basalt have no overlying soil layer at all. These exposed basalt areas support a diversity of lichens, forbs, and mosses.

Current impacts of human uses and Vegetation Management on Soils

Visitation causes most current impacts to soils in the Monument, including where user created trails have worn very shallow soils (< 10.0 inches) down to bedrock. In a small number of cases associated with lighthouse properties, cement was historically used to surface trails (e.g., the "sidewalk" on Patos Island), which has provided exceptional hardening to the trail tread that protects the soils in that location.

Trails with native surfaces on sandy (loamy) soil textures and on slopes greater than 30 percent are the most vulnerable to chronic erosion. Approximately 20 percent of the existing 14.9 miles of trails in the Monument are in this category. Existing user created trails are distributed across the Monument with routes on headlands and small islands throughout the archipelago. Trail systems on the southern end of Lopez Island constitute the majority of areas most prone to erosion.

The BLM's management of vegetation within the Monument is limited to the removal of hazard trees that pose a threat to safety or property and treatment of invasive plants through non-ground disturbing methods; these activities have very limited impacts on soils. Current weed control strategies have been to cut weeds before they go to seed, thus reducing the weed seed bank in the soil and minimizing soil disturbance at those sites.

Soils within the Monument have substantial water holding capacity, because they are isotic and/or have substantial quantities of organic matter, which can hold approximately 80 percent of soil moisture. Where soil displacement has occurred, the soils and sediment generally remain on land rather than entering marine or freshwater aquatic environments. One exception to this is at Cattle Point on San Juan Island, where natural erosion of sandy soils has caused soil deposition in the surrounding coastal waters.

Effects of the Alternatives

Under all alternatives, the BLM would take mitigation measures to minimize soil loss on lands exposed through management actions (see Appendix F: best management practices). Regardless of mitigation measures, soil loss and compaction may occur through building, maintaining, and using trails, as well as through ground disturbance from vegetation management. See Appendix H for maps with specific locations of trails for each alternative.

Impacts from travel and transportation management on soils

No Action Alternative

Under the No Action Alternative, there would continue to be no travel network designated for public access in the Monument. The BLM would continue to maintain the current 0.9 miles of road in the Monument for authorized and administrative uses. The current network of 16 miles of primarily user created trail (including 0.6 miles on adjacent Coast Guard about which the BLM will provide recommendations) would also likely persist. Given recent trends (see Access and Visitor Use Issue 1), visitor use would likely increase and user created trails would continue to proliferate under the No Action Alternative.

Additional user created trails would expose soils to more weather events and disturbance, which would lead to more erosion. A minimum of 7 acres (4 acres of road and 3 acres of trail), or 0.7 percent of the Monument would continue to be exposed to possible soil compaction and displacement from travel. All trails would continue to be open to all non-motorized trail uses. Under the No Action Alternative, it would be much more difficult to strategically manage these trail systems to mitigate soil loss and erosion.

Without management intervention, the transportation system under the No Action Alternative would have the greatest risk to soil function of any alternative.

Alternative A

Under Alternative A, the BLM would continue to maintain 1 mile of road for authorized and administrative use at Point Colville, Watmough Bay, and Turn Point. This would result in the continuation of a total of 4 acres of potential soil disturbance from road use. Additionally, there would be no designated trails under Alternative A and the BLM would maintain trails only on an as needed basis for authorized and administrative purposes (e.g., to access areas for monitoring and maintenance activities). Assuming there would be no unauthorized use of undesignated routes, trail systems within the Monument would revegetate over time, thus reducing erosion across the Monument. Erosion of the most susceptible Monument soils would decrease dramatically compared with other alternatives.

Alternative B

Under Alternative B, the BLM would designate all existing roads (1 mile) for public motorized use. This would result in the continuation of a total of 4 acres of potential soil disturbance from road use. Additionally, the BLM would designate 20.3 miles of trail for hiking (including 0.9 miles the BLM would recommend for designation on adjacent Coast Guard land). This would include adding approximately 4 miles to the existing network of trails, mainly on Chadwick Hill, Watmough Bay, Point Colville, Iceberg Point, Kellett Bluff, and Patos Island. Soil function would be simplified within the footprint of the newly developed trails, as the function would no longer support native plant communities and the biological function and nutrient cycling capacity of the soils would be impaired on and adjacent to trail surfaces.

In total, soil function on 9 acres, or 0.9 percent of the Monument, would be simplified and the soils would be more susceptible to displacement due to travel. A seasonal closure intended to minimize disturbance to nesting seabirds would exist on 0.12 miles of trail, substantially reducing erosion potential for those segments of trail.

Compared to the No Action Alternative it would be much easier to manage a designated transportation route and mitigate much of the erosion potential.

Alternative C

Under Alternative C, the BLM would designate 0.6 miles of existing road for public motorized use and maintain an additional 0.4 miles of existing road for authorized and administrative uses. This would result in the continuation of a total of 4 acres of potential soil disturbance from road use. In addition, the BLM would designate 12 miles of trail for hiking (including 0.7 miles the BLM would recommend for designation on adjacent Coast Guard land). Under Alternative C, the BLM would not develop new trail segments (though it would reroute less than 0.1 miles of existing trail) and would eliminate 3.6 miles of existing user-created trails. Equestrian use would continue to be allowed on 2.6 miles of these trails. Equestrian use would be limited to select trails on Chadwick Hill and Watmough Bay on Lopez Island that are low gradient and less susceptible to erosion.

In total, soil function on 6 acres, or 0.6 percent of the Monument would be simplified and the soils would be more susceptible to displacement due to travel. A wet season closure would be implemented on 0.05 miles of trail for hiking use and 2.4 miles of trail for equestrian use, substantially reducing the potential erosion on that mileage.

Compared to the No Action Alternative, it would be much easier to manage a designated transportation route and mitigate much of the erosion potential.

Alternative D

Under Alternative D, the BLM would designate 0.9 miles of existing road for public motorized use and maintain an additional 0.1 miles of existing road for authorized and administrative uses. This would result in the continuation of a total of 4 acres of potential soil disturbance from road use. In addition, 24.6 miles of trail would be open to hiking and 8.4 miles would be open to equestrian use and bicycle use. This is the most extensive network of trails considered under any alternative. In addition to the trails designated in Alternative B, new trails would be designed on: Patos Island, Posey Island, Reeds Bay

Island, Blind Island, Point Colville, Turn Point, President Channel, Victim's Island, Cattle Point, Iceberg Point, Chadwick Hill, Watmough Bay, Lummi Rocks, Carter Point, and Eliza Point. Except for a small section of trail on Watmough Bay, these trails would not be on soils more prone to erosion.

In total, soil function on 13 acres, or 1.3 percent of the Monument would be simplified and the soils would be more susceptible to displacement due to travel. Alternative D would have the largest designated transportation system of any action alternative and therefore would have the greatest potential to simplify soil function and contribute to soil erosion of any alternative except the No Action Alternative. A wet season closure would be implemented on 0.05 miles of trail for hiking use, 8 miles of trail for bicycle use, and 8.2 miles of trail for equestrian use, mitigating much of the potential for seasonal soil displacement.

Compared to the No Action Alternative, it would be much easier to manage a designated transportation route and mitigate much of the erosion potential.

Impacts from Vegetation Treatments on Soils

The alternatives vary in the estimated extent of vegetation treatments needed to achieve objectives, as well as in the treatment types the BLM would allow. The BLM would determine the location, timing, and type of treatments through additional project-level planning and NEPA compliance. Habitat and Plants Issue 6 discusses potential effects from herbicide treatments on soils.

Descriptions of the potential impacts on soils from various vegetation treatments are summarized from the Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report (BLM 2007b). Pages 4-11 through 4-18 of this document are summarized below and incorporated here by reference.

Potential impacts on soils from vegetation treatments in general

All vegetation treatments can potentially result in increased rates of erosion and reduced water infiltration, leading to reduced soil productivity. The risks of increased erosion within the Monument would depend on the type of treatment and the local site conditions. Increased erosion would potentially result in reduced soil quality and increased sedimentation in nearby bodies of water. Reestablishing vegetation on the site and maintaining organic matter at the soil surface (e.g., plant litter, forest duff, or mulch) would lower erosion rates.

Vegetation removal would also contribute to a short-term reduction in water infiltration into soil. Soil compaction associated with some vegetation treatment methods could reduce infiltration and soil productivity by eliminating pore spaces used for water storage and air exchange. These effects would typically last until vegetation recovered at the treatment site.

Potential impacts from mechanical and manual treatments

Mechanical and manual treatments would affect soils by removing vegetation, by exposing or disturbing topsoil, and by compacting soils and affecting water infiltration. Because plant and litter cover protect the soil, and roots hold the soil in place, removal of plant materials exposes soil, making them vulnerable to increased erosion and drying out. Laborers and equipment associated with treatments can cause soil disturbance and compaction at treatment sites. Mechanical and manual treatments can disturb soil, exposing soil organisms to desiccation and predation.

Treatments involve pulling or cutting vegetation with non-motorized hand equipment or chainsaws, instead of heavier equipment, would have less direct effect on soil than treatments with heavier equipment. Limiting the number of people and the amount of time spent in each site would help minimize trampling for these treatments (Tu et al. 2001).

Soil texture and morphology, site topography, and rainfall affect a soil's response to mechanical and manual treatments. On sites that support coarse-textured soils with high infiltration rates, or clayey soils with low infiltration rates, some mechanical treatments could result in little change in infiltration rates. For most other soils, mechanical treatments that break up the soil surface and create furrows and ruts would increase water infiltration. Avoidance of mechanical treatments in windy areas with poorly structured soils would help to reduce loss of soil to wind erosion. Erosion can be prevalent on slopes

greater than 20 percent. In general, leaving vegetation residues on the soil surface, or mulching and spreading them after a mechanical or manual treatment, would help protect the soil surface.

Potential impacts from prescribed fire

Prescribed fire would primarily affect soils by consuming organic material including vegetative litter and cover and dead and down woody fuels. Depending upon the severity of the fire, changes would be beneficial or deleterious (Neary et al. 1999). Prescribed fire would help cycle soil nutrients and support the recovery of beneficial plant communities that improve soil function. Prescribed fire activities may also locally disturb soils by compaction, displacement, or causing an increase in water repellency from physical and chemical alterations (hydrophobicity). Compaction may occur from equipment operating in and around prescribed fire units. Displacement may occur from fireline construction or mop-up activities. Measurable physical and chemical soils alterations may occur in localized areas that experience more intense heat (170-200 °C) over longer durations. This could occur in larger piles or in larger concentrations of large diameter fuel (Debano 1981). Most of these undesirable effects would be mitigated through project design or occur in such small isolates that they would not adversely affect the overall function and integrity of soils at the treatment site.

Potential impacts from biological treatments

Biological treatments could involve containment by domestic animals (such as goats), insects, or pathogens. Biological control of vegetation using domestic animals would result in some effects to soil on public lands. The effects would be dependent on the type of animal used and the intensity and duration of the treatment in a particular area.

The action of animal hooves would cause some disturbance, shearing, and compaction of soil, increasing its susceptibility to both water and wind erosion. Domestic animals could alter nutrient cycling processes in soil by depositing organic nitrogen in urine and feces. Following a planned vegetation management program can limit unintended effects by limiting the number and amount of time animals remain on any one site and using fencing and salt/nutrition blocks to restrict animals to treatment areas.

No Action Alternative

Under the No Action Alternative, the BLM would continue its current very limited approach to vegetation treatments. Manual and mechanical treatments would continue to be limited to removal of hazard trees and non-ground disturbing treatment of invasive plants. Assuming current trends continue there would be no prescribed fire, biological, or herbicide treatments. Although localized effects to soil could occur, the effects of the current level of manual and mechanical treatments on soils are likely to be negligible due to their very small size (approximately than 20 acres per year). This would result in the fewest direct effects to soils from vegetation treatments throughout the Monument. However, invasive plants would continue to propagate and replace native plant communities, increasing the long-term potential of impaired soil function and simplification.

Alternative A

Under Alternative A, the BLM would continue to undertake very limited vegetation treatments. The BLM estimates that approximately 650 acres of mechanical or manual treatment (i.e., an average of approximately 35 acres per year) and 390 acres of biological treatments (i.e., an average of approximately 20 acres per year) would occur during the life of the plan. In some cases, these treatments would take place on the same acres (e.g., the BLM might follow up a biological treatment with a mechanical or manual treatment in the same area). The BLM would prohibit prescribed fire and herbicide use under this alternative. Although localized effects to soils of the types described above could occur, the effects of these treatments on soils are likely to be minimal and short-term due to their small size. This alternative would have the fewest direct effects to soils from vegetation treatments of any of the action alternatives. However, without the use prescribed fire and chemical treatments (e.g., herbicides) the success of establishing native plant communities and restoring biological soil functions would be diminished.

Alternative B

Under Alternative B, the BLM—likely working with tribes and other partners—would undertake extensive vegetation treatments in the Monument. The BLM estimates that approximately 5,930 acres of

mechanical or manual treatment (i.e., an average of approximately 300 acres per year) , and 1,500 acres of biological treatments (i.e., an average of approximately 75 acres per year) , and 1,700 acres of prescribed fire (i.e., an average of approximately 85 acres per year) would occur during the life of the plan. In many cases, multiple acres of treatment would take place on the same acres of land (e.g., the same acre could undergo mechanical or manual treatments before and after a prescribed fire) .

Potential for direct effects to soils would be substantially more than under the No Action Alternative and alternatives A and D, but somewhat less than under Alternative C and Sub-Alternative C. The vegetation treatments proposed under Alternative B would establish a long-term trajectory that would have the potential to improve biological soil function and nutrient cycling through the establishment and maintenance of native plant communities on areas receiving treatments.

Alternative C

Under Alternative C, the BLM—likely working with tribes and other partners—would undertake extensive vegetation treatments in the Monument. The BLM estimates that approximately 7,930 acres of mechanical or manual treatment (i.e., an average of approximately 400 acres per year) , and 2,450 acres of biological treatments (i.e., an average of approximately 120 acres per year) , and 3,520 acres of prescribed fire (i.e., an average of approximately 180 acres per year) would occur during the life of the plan. In many cases, multiple acres of treatment would take place on the same acres of land (e.g., the same acre could undergo mechanical or manual treatments before and after a prescribed fire) .

Potential for the direct effects to soils would be substantially more than under the No Action Alternative and alternatives A and D, somewhat more than under Alternative B, and somewhat less than under Sub-Alternative C. The vegetation treatments proposed under Alternative C would establish a long-term trajectory that would have the greatest potential to most reliably improve biological soil function and nutrient cycling through the establishment and maintenance of native plant communities.

Sub-Alternative C

The BLM would prohibit chemical treatments (e.g., herbicides) under Sub-Alternative C. Because of this prohibition, the BLM estimates that it would need a high very high repetition rate of mechanical and manual treatments to achieve the Sub-Alternative C objectives. The BLM estimates that approximately 28,320 acres of mechanical or manual treatment (i.e., an average of approximately 1,415 acres per year) . In many cases, multiple acres of treatment would take place on the same acres of land (e.g., the BLM might remove woody shrubs and apply native plant restoration in the same area) . This would result in the greatest potential impact to soils from vegetation treatments of any alternative.

Alternative D

Under Alternative D, the BLM would undertake vegetation treatments as needed to maintain approximately the current vegetation conditions in the Monument. The BLM estimates that approximately 810 acres of mechanical or manual treatment (i.e., an average of approximately 40 acres per year) and 50 acres of prescribed fire (i.e., an average of approximately 3 acres per year) would occur during the life of the plan. While the BLM would allow biological treatments under this alternative, it estimated that this treatment type would not be necessary for meeting the objectives of this alternative. In some cases, these treatments would take place on the same acres (e.g., the same acre could undergo mechanical or manual treatments before and after a prescribed fire) .

Potential direct effects to soil function, described above, would be somewhat more than under the No Action Alternative and Alternative A, and substantially less than under alternatives B, C, and sub-C. Alternative D would achieve fewer long-term benefits, over a smaller area, for biological soil function and nutrients in comparison to alternatives B and C.

Conclusion

The BLM's management of the Monument would have the fewest direct impacts to soil resources under Alternative A, due to limitations on access and vegetation management. However, alternatives B and C are likely to have the greatest long-term benefits to soils resources by increasing soil biodiversity through more extensive vegetation management and a comprehensive invasive weed management strategy.

Cumulative Effects of the Alternatives on Soils

Anticipated population growth and increases in tourism in San Juan County and Washington State are likely to drive additional land development and support the continued propagation of invasive plants that will simplify soil function and reduce soil biodiversity (U.S. Census Bureau, 2015; Decaëns et al, 2006). Cumulative effects to soil function from management or visitor use vary by alternative. Extensive vegetation management and subsequent maintenance under alternatives B and C have the highest potential of generating chemical, physical, and biological soil responses, which over time, have a greater potential to provide function and habitat that may be diminishing on other lands across the county and state. Alternatives with fewer options for vegetation management (No Action Alternative and alternatives A and Sub-C) or without ambitious vegetation restoration objectives (No Action Alternative and alternatives A and D) would have less potential for soils within the Monument to contribute to increasingly scarce ecosystem services.

Continuation of all or parts of the existing trail system will contribute to the trend of soil simplification that is likely to occur across San Juan County with population and land use increases. Under the action alternatives, the designation and maintenance of trail systems may help to mitigate persistent impacts to soil resources that would otherwise receive less effective management under the No Action Alternative. Due to the small size of the Monument, the effects of all alternatives when combined with existing and anticipated effects to soils resources at a county-scale are very small and the ecological significance of those effects are most relevant at the site scale.

Special Designations

Key Points

- The BLM designed the alternatives to meet the purpose and need of the planning effort to protect the objects and values for which the Monument was designated, many of which overlap with the values the BLM determined to meet the ACEC manual's definition of relevance and importance.
- The existing ACEC would continue to apply to 503 acres on the south end of Lopez Island only under the No Action Alternative.
- The No Action Alternative and alternatives B, C, and D all provide some level of support for the Cascadia Marine Trail.
- Under all alternatives, the Monument would provide at most a small percent of the designated campsites associated with the Cascadia Marine Trail.

This section contains two analytical issues:

1. How would the alternatives affect areas of critical environmental concern within the Monument? (page 212)
2. How would the alternatives affect the extent and experience of using the Cascadia Marine Trail? (page 213)

For information on the differences between congressionally or presidentially established special designations and ACEC criteria see the Special Designations section of Appendix E.

Special Designations Analytical Issue 1: *How would the alternatives affect areas of critical environmental concern within the Monument?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

There are two ACECs within the Monument. The Iceberg Point and Point Colville Areas of Critical Environmental Concern Decision Record (BLM 1990) designated the BLM-administered lands at Iceberg Point and Point Colville as ACECs; the BLM later extended the decisions in this document to Watmough Bay and Chadwick Hill after the agency's acquisition of these areas. The acreage managed under the 1990 ACEC decisions now total approximately 503 acres. The BLM designated the current ACECs to preserve their "natural values." Neither the decision document nor the analysis documents associated

with the ACECs discuss relevant and important values or provide details on the natural values for which the areas were designated (BLM 1988a, BLM 1990).

Effects of the Alternatives

No Action Alternative

The 1990 ACEC decisions provided management direction that helped protect the BLM-administered lands on Lopez prior to the designation of the Monument in 2013. The designation of the Monument broadened and made permanent the protection of the area's special objects and values.

Under the No Action Alternative, the existing ACEC would continue to apply to 503 acres on the south end of Lopez Island (Iceberg Point, Point Colville, Chadwick Hill, and Watmough Bay). The 1990 ACEC decisions would remain in place to protect these areas' "natural values." The content of those decisions can be found in Appendix D.

Alternatives A, B, C, D

Under these alternatives, the BLM would not designate any ACECs. The BLM planning team determined that the alternatives considered in the Draft RMP/EIS, which all meet the purpose and need for the planning effort, would protect the area's relevant and important values (see Appendix C). Since the values do not require special management to protect them from the potential effects of actions permitted by the alternatives, the action alternatives do not include ACECs. The BLM designed the alternatives to meet the purpose and need of the planning effort to protect the objects and values for which the Monument was designated, many of which overlap with the area's relevant and important values.

Conclusion

ACECs would occur within the Monument only under the No Action Alternative. However, relevant and important values would be protected under all alternatives (see Appendix C).

Special Designations Analytical Issue 2: *How would the alternatives affect the extent of the Cascadia Marine Trail?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

The Monument has two sites associated with the Cascadia Marine Trail: Blind Island and Posey Island, which have four and two campsites respectively. The BLM co-manages camping at these sites with Washington State Parks. Camping at these sites is open only to those who arrive by human or wind powered watercraft. The seven campsites located at Patos Island support the Cascadia Marine Trail by providing boat-accessible camping opportunities, but are not officially designated as part of the trail.

The Secretary of the Interior designated the Cascadia Marine Trail as a National Recreation Trail in 1994; it was recognized as one of 16 national millennium trails in 1999. The trail encompasses a network of sites—which visitors can access by following an array of possible routes—extending from Olympia, Washington, up through Puget Sound and the San Juan Islands to the British Columbia border. It currently includes 66 associated campsites and 160 associated day use sites. An array of Tribal, Federal, State, and local agencies manage these sites. Washington State Parks, as the trail's lead agency, and the Washington Water Trails Association provide direction and/or assistance to the managing entities.

Effects of the Alternatives

No Action Alternative

Under the No Action Alternative, there would continue to be camping in six designated sites at Blind and Posey Island along the Cascadia Marine Trail. The seven campsites as Patos Island would continue to support the Cascadia Marine Trail as a day-use area and by providing boat-accessible camping. Given current recreation trends, there would continue to be high levels of visitation and camping at these sites during the summer.

Alternative A

Under this alternative, the BLM would facilitate use of the Monument for authorized research, educational, cultural, and spiritual activities, but not for recreation. As a result, no acres of Monument

land would be available for recreation to support the Cascadia Marine Trail. This would remove the six designated sites at Blind and Posey Island along the Cascadia Marine Trail. This would also remove the seven campsites located at Patos Island that support the Cascadia Marine Trail. Under this alternative, there would be minor effect to visitors seeking a human powered watercraft designated camping experience as part of the Cascadia Marine Trail and would have a minor effect on other Cascadia Marine Trail designated campsites along the 160-mile water trail.

Alternative B and C

Under alternatives B and C, there would continue to be camping in six designated sites at Blind and Posey Island along the Cascadia Marine Trail. The seven campsites as Patos Island would continue to support the Cascadia Marine Trail as a day-use area and by providing boat-accessible camping. Under these alternatives, the BLM would not designate additional camping sites to support the Cascadia Marine Trail. Given current recreation trends, there would continue to be high levels of human powered watercraft visitors participating in this activity during the summer.

Alternative D

Under Alternative D, there would continue to be camping in six designated sites at Blind and Posey Island along the Cascadia Marine Trail. The seven campsites located at Patos Island would continue to support the Cascadia Marine Trail as day-use areas and provide camping opportunities although these sites are not officially designated Cascadia Marine Trail sites.

Under this alternative, the BLM would allow designated site camping on an additional 221 acres of Monument land. This would approximately double the current Monument acres open to designated site camping. The BLM would determine specific locations for new designated sites during plan implementation; this would involve a separate project level planning and NEPA compliance process prior to any on-the-ground disturbance. The BLM would only allow camping in these areas after the completion of the project level planning to designate sites. These sites support the Cascadia Marine Trail and would be open only to visitors arriving via non-motorized watercraft. Given the popularity of current designated site camping opportunities in the San Juan Islands, it is likely that visitor use of these sites would be high.

Conclusion

The Monument would continue to provide 9 percent of the total number of designated campsites available to support the Cascadia Marine Trail in the No Action Alternative and alternatives B and C. Under Alternative A, the BLM would limit access to Monument lands and remove the existing opportunities supporting the Cascadia Marine Trail at Blind and Posey Islands and to a lesser degree at Patos Island. Under Alternative D, the BLM would develop new designated sites supporting the Cascadia Marine Trail over the life of the plan. Alternative D would provide the greatest contribution of any alternative to the Cascadia Marine Trail. Under all alternatives, Monument lands would continue to have an overall minor effect on other Cascadia Marine Trail designated campsites along the 160-mile water trail.

Cumulative effects on designated site camping opportunities to support the Cascadia Marine Trail in the San Juan Islands

The alternatives would vary in their incremental impact on the supply of camping opportunities supporting the Cascadia Marine Trail. Since the designation of the trail in 1994, 66 associated campsites and 160 associated day use sites have been added to the Cascadia Marine Trail. An array of entities manages these associated sites, including Tribal, Federal, State, and local agencies. The BLM is not aware that any public land managers in the San Juan Islands are currently planning any substantial expansions or reductions in camping opportunities.

Under the No Action Alternative and alternatives B and C, the Monument would continue to provide 9 percent of the total number of designated campsites associated with the Cascadia Marine Trail.

Under Alternative A, the Monument would not provide camping or day use areas available for those exploring the Cascadia Marine Trail; this would represent a 9 percent decrease in campsites available along the trail. Given the high level of current participation in camping in these areas, this would likely create additional competition for remaining sites along the trail.

Under Alternative D, the BLM's contribution of designated campsites supporting the Cascadia Marine Trail would increase over the life of the plan. This would increase the trail's capacity for visitors and potentially alleviate visitor pressure on existing sites. It could also allow trail visitors to access portions of the San Juan Islands that currently do not have safe and available camping.

Tribal Interests

Key Points

- There are diverse tribal interests related to the Monument, including interests in the protection of cultural sites, accessing the Monument for traditional cultural practices and the exercise of treaty rights, and the availability of plants and wildlife for various tribal uses.
- Under all alternatives, the BLM would work with tribes to facilitate traditional activities and the exercise of tribal treaty rights.
- Alternative A would have the least potential for disturbance and loss of cultural sites.
- Alternatives B, C, and Sub-Alternative C would most enhance habitat for culturally important plants such as camas.

This section contains one analytical issue:

1. How would the alternatives affect tribal interests and activities? (Page 215)

Background

Proclamation 8947 describes the use of the San Juan Islands by native peoples dating back to the end of the last glacial period. Archaeological resources associated with this long-standing use of the land are an object of scientific or historic interest for which the Monument was designated, as are some of the vegetative communities, including fire-managed grasslands and areas (remnant cultural-historical "gardens") of Great Camas. In addition, the proclamation states: "Nothing in this proclamation shall be deemed to enlarge or diminish the rights of any Indian tribe. The Secretary shall, in consultation with Native American tribes, ensure the protection of religious and cultural sites in the Monument and provide access to the sites by members of American Indian tribes for traditional cultural and customary uses, consistent with the American Indian Religious Freedom Act (42 USC 1996) and Executive Order 13007 of May 24, 1996 (Indian Sacred Sites)."

Native American/ Coast Salish Peoples have occupied the region for more than 10,000 years, utilizing lands in the San Juan Islands for hunting, fishing, plant gathering, trade and exchange, and other cultural, social, and religious activities. Many of these activities occurred within the Monument.

Tribal Interests Analytical Issue 1: *How would the alternatives affect tribal interests and activities?*

See Appendix B for analytical methods used in this analysis. Impacts from shoreline stabilization on cultural sites are analyzed under Cultural Resources Issue 1.

Affected Environment

Habitat for fish, wildlife, and plants of traditional cultural value to the tribes occur on public lands and waters within the San Juan Islands, including within the Monument. Habitats supporting wildlife species that tribes traditionally hunted, gathered, or fished, and that support culturally important plants gathered for subsistence, medicinal, ceremonial practices, and other uses are available for access and use on public lands. The BLM is aware that marine shorelands and tidelands were important and extensively used by tribes for subsistence and cultural purposes. However, the specific locations of traditional use in the Monument are largely unknown to the BLM. Identification of traditional uses or properties of traditional cultural and religious importance is an ongoing process addressed during consultation between the BLM and tribes and is often specific to individual tribes or groups.

Tribes have identified several locations that are culturally important for gathering of traditional resources, particularly plants, on lands in the Monument. However, the BLM may be unaware of many traditional resource procurement locations and their ongoing use. Traditional root gathering, a critical resource for ancestral peoples living near the Salish Sea, continues to be important to the tribes for its nutritional

values and the added benefit of perpetuating tribal traditions. Root gathering locations, often passed down through families, continue to be used in many areas. Tribal members are no longer able to collect roots in traditional locations when access is restricted or prohibited or environmental changes, particularly those resulting from land use practices, alter the root grounds. In addition to plant gathering areas, tribes may consider many other sites culturally and traditionally important, including village sites, fishing stations, graves, prayer sites, pictographs, petroglyphs, talus/cache pits, rock cairns and alignments, and various other sites.

Various roots, bulbs, berries, seeds, and nuts are important components of the traditional diet. In addition to fruits and berries, a variety of traditional roots and bulbs occur within the Monument.

Habitats within and adjacent to the Monument support larger terrestrial species important to subsistence and traditions. These include deer and numerous smaller mammals, along with traditional marine subsistence resources, such as salmon, halibut, cod, shellfish, marine mammals, and birds. Access to Puget Sound through Monument lands is available for exercise of tribal fishing rights and interests, but specific locations of ongoing traditional use for fishing related activities are, with few exceptions, unknown to the BLM. BLM management may indirectly affect nearshore habitat and wildlife below mean high-tide, though they are outside of the BLM's jurisdiction, which ends at mean high tide.

Tribes have not formally identified to the BLM sacred sites or specific locations of ongoing ceremonial or religious practices within the Monument. This might be due in part to the culturally sensitive nature of the values at those locations or the practices or ceremonies conducted. The BLM is unaware of Coast Salish sacred sites or locations of ceremonial or religious practices that may occur within the Monument.

Effects of the Alternatives

The alternatives vary in their potential effect on the integrity of sites, locations, and resources identified as important to one or more tribe for cultural continuity, Indian trust assets, or as being integral to treaty-based rights or responsibilities. They vary in the potential for vegetation management and recreational activities to disturb sites and activities of traditional importance. They also vary in the extent that they would benefit plants and wildlife associated with traditional subsistence use. Restrictions on the discharge of firearms would not apply to tribal members using firearms for the purposes of hunting. Management of wildlife species of concern (i.e., potentially harmful wildlife) could affect culturally important plants and animal species important for traditional uses (Arcese et al. 2014). The effects of the BLM potentially engaging with other agencies to manage wildlife species of concern are described under Wildlife Issue 4.

Under all alternatives, the BLM would collaboratively engage with tribal government partners to facilitate traditional uses and the exercise of treaty rights, develop opportunities for co-stewardship of plant communities and culturally important plant species, engage tribal youth and elders, and maintain and improve access for exercise of treaty rights and traditional cultural practices. Through engagement with the tribes, BLM would foster programs to enrich opportunities for tribal cultural, spiritual, and educational activities including projects to restore Salish place names within the Monument.

The effects of tools available to protect cultural sites from shoreline erosion are described under Cultural Resources Issue 1.

Impacts from Recreation

Objectives for recreation include protecting the Monument's objects and values from damage, alteration, or loss due to visitation. Under all action alternatives, several recreational activities that could disturb, damage, alter or destroy important objects and values of cultural importance for which the Monument was designated would be prohibited. The BLM would undertake temporary closures as necessary to protect the Monument's ecological and cultural values, as well as sensitive tribal activities. Recreational use would vary by alternative but access for tribal use and exercise of treaty rights would continue under all alternatives. Opportunities for solitude and quiet would continue to be available at certain times and seasons in the Monument under all alternatives.

Recreational use and access that affects the integrity of a site, location, or resource identified as important to one or more tribe for cultural continuity, an Indian trust asset, or as integral to a treaty-based right or

responsibility can impact tribal treaty rights and interests. Recreational use and access can impact cultural sites through disturbance, soil compaction, altered surface water drainage, erosion, intrusions to the setting, and access leading to unauthorized collection or vandalism. These effects can result in a loss of site integrity and associated cultural values.

In addition to creating potential for the disturbance or destruction of cultural sites, recreational use can interfere directly with the exercise of treaty rights and traditional cultural uses and practices (e.g., hikers could inadvertently interfere with traditional ceremonies and the setting in which it takes place). Recreational activities can cause visual and aural intrusions to the cultural or natural setting in which spiritual or other traditional practices are taking place. Some visual and aural impacts could be reduced or prevented in instances where tribes request that the BLM undertake a temporary closure of an area for the duration of a traditional activity. The BLM would consult with tribes to identify activities that may affect suitability of an area for traditional activities and the exercise of tribal treaty rights.

In addition to affecting the experience and setting for traditional practices, recreational use and access can also effect opportunities to exercise treaty-protected activities by disturbing cultural resource values and settings (e.g., trampling native plant communities or disturbing cultural resources). Repeated use in an area can compact soil, increase erosion, and introduce invasive species that alter cultural settings and important plant communities for traditional plant gathering. Even where land managers require visitors to remain on trails, repeated visits to locations can create new social trails, leading visitors to or across sites of traditional or cultural importance. Opening areas to new or increased access and use can increase risk to previously undisturbed and fragile resources from intentional or unintentional damage and loss.

Camping could permanently impact traditional cultural values through direct disturbance of site structure, soil compaction, altered surface water drainage, erosion, creation of new routes, and visual and aural intrusions to the setting. Regulating or restricting camping and recreational use can reduce the potential for impacts to cultural sites by controlling the amount and location of activities in areas with sensitive resources. Restricting camping to designated sites would concentrate impacts to those locations and reduce the risk of disturbing traditional cultural resources and values located outside of designated campsites though impacts from camping would still occur. Prohibiting camping or restricting it to designated campsites and would reduce the risk of impacts to cultural resources and tribal interests from these activities, if access for cultural purposes including exercise of treaty rights can be maintained and cultural site protections are implemented and maintained.

Under all alternatives, the BLM would address potential impacts to cultural resources and tribal interests at the design or implementation phase of future projects through consultation with affected tribes along with National Historic Preservation Act Section 106 review. Consultation with tribes regarding tribal interests and potential impacts from proposed projects would be complimentary to Section 106 review and compliance. The BLM, in consultation with affected tribes and in consideration of tribal interests and treaty rights, would avoid, minimize, or mitigate potential impacts on historic properties and other cultural resources. Consultation and identification of potential impacts to tribal interests prior to project implementation would reduce potential adverse impacts.

No Action Alternative

Under the No Action Alternative, the BLM would continue to manage the Monument to support recreational activities and visitor needs. Approximately 14.9 miles of existing trails in the Monument would continue to be open to non-motorized travel. If current trends continue, visitors would use these trails almost exclusively for hiking, with a small amount of equestrian use on Lopez Island. Overland hiking would continue and trail miles in the Monument's more accessible grasslands and shrublands, such as at Iceberg Point and Cattle Point, would likely increase over time.

Use of the trails would continue to have direct short-term and long-term impacts on cultural sites and other cultural properties crossed or accessed by trails, through soil compaction, erosion via channeling of water, and widening of trails during wet periods. Currently, 76 percent (19 sites) of the Monument's recorded cultural sites are within 164 feet of roads and trails. Under this alternative, measures to reduce impacts to sites would continue but the potential for impacts would grow if visitation continues to

increase over time. Increased visitation could contribute to increased disturbance to cultural and natural resource sites and increased intrusion into locations for traditional and cultural practices.

Dispersed camping would continue within the Monument except where prohibited by the current ACEC decisions covering Chadwick Hill, Iceberg Point, Point Colville, and Watmough Bay. Twenty-two recorded cultural sites would continue to occur within areas open to camping. This alternative would include the potential for dispersed camping in 66 acres of grassland potentially associated with traditional plant gathering, including locations at Cattle Point, Kellett Bluff, Turn Point, McConnell Rocks, and Lummi Rocks. If current recreation patterns continue, participation in this activity would remain relatively low. Camping in existing designated sites would continue. Approximately half of the recorded cultural sites within the Monument occur in or near designated camping areas.

Alternative A

Under Alternative A, the BLM would facilitate use of the Monument for authorized research, and educational, cultural, and spiritual activities. The BLM would not designate any of the potential RMAs under Alternative A and would prohibit recreation on Monument lands. This alternative would minimize impacts to cultural sites and traditional use from visitor use to a greater extent than any other alternative. Traditional uses of cultural properties would continue and potentially increase over the life of the plan.

The impacts from recreation described under the No Action Alternative would not continue under this alternative, though impacts from access for administrative and authorized uses would continue. Because there would be many fewer visitors on the Monument under this alternative, and the BLM would authorize uses, the BLM expects fewer and less severe impacts to cultural resources under this alternative. The BLM would continue to maintain roads and trails for authorized and administrative uses. Impacts from road and trail use and maintenance for authorized uses would continue but would be less than under all other alternatives.

There would be fewer opportunities to inform, educate, and engage the visiting public about tribal heritage and the important natural and cultural values associated with the Monument. Opportunities for the exercise of treaty rights and traditional and cultural practices requiring solitude and quiet would increase and tribal enrichment programs and engagement would likely increase due to the reduction in potential conflicts from visitor uses under this alternative.

Alternative B

Under Alternative B, the BLM would designate all potential RMAs except Category A and B Rocks. All but 10 acres of the Monument would remain open to recreational use. The impacts from recreation described under the No Action Alternative would not continue at sites closed to recreational use, though minor impacts from administrative and authorized uses would continue. To provide opportunities for solitude and quiet, 168 acres of the Monument would be open for recreation by permit only, which would reduce impacts by controlling the amount of recreation allowed in those areas. As in alternatives C and D, all 25 recorded cultural sites would be within designated RMAs in this alternative.

The BLM would designate 19.3 miles of trail for hiking under this alternative, a 27 percent increase compared to existing trail miles. This would include 5.2 miles of new trails in areas previously without trails increasing the potential for short-term and long-term direct and indirect impacts to cultural sites and areas of traditional cultural use. Authorizing new trail routes would increase potential impacts to cultural sites and areas for traditional cultural uses. The BLM would consult with affected tribes and conduct cultural resource surveys of the proposed designated trail routes prior to implementation. Rerouting trails to avoid cultural sites and places important for traditional cultural practices would reduce potential impacts to tribal interests. Limiting visitor use to designated trails except for authorized purposes would reduce impacts to cultural sites and places important for traditional cultural practices.

Under this alternative, there would continue to be designated site camping in existing sites only. RMAs with designated sites would include 13 known cultural sites, approximately half of the recorded sites in the Monument.

Approximately 726 acres would be open to dispersed camping with a permit, including the locations of nine recorded cultural sites. To provide opportunities for quiet and solitude when camping, permits would be limited to one group per night per location with no more than five campers. The BLM would reduce these impacts by not issuing permits for dispersed camping where adverse impacts to cultural and traditional sites would occur. When developing the permitting system during plan implementation, the BLM would consult with affected tribes and conducting cultural resource surveys of the areas proposed for dispersed camping and avoiding cultural sites and values that would be adversely affected would reduce potential impacts to tribal interests.

The BLM would prohibit all camping on 78 acres of the Monument, including the locations of six cultural sites. This would prevent impacts from camping to 24 percent of sites, as well as to places within these RMAs important for traditional cultural activities or other tribal interests.

Under this alternative, the BLM would allow educational and interpretive signs at trailheads and landing areas only. Compared to alternatives C and D, where the BLM could place educational and interpretive signage in locations throughout the Monument, there would be fewer opportunities to inform, educate, and engage the public about tribal heritage and the important natural and cultural values associated with the Monument.

Alternative C

Under Alternative C, the BLM would designate all potential RMAs except for Category B Rocks. All but 7 acres of the Monument would remain open to recreational use. The number of known cultural sites located within RMAs would be similar to Alternative B. Category B Rocks reportedly receive minimal visitation so this closure would likely have minimal effect on cultural or natural resources for those areas. The BLM would also manage 3 acres of the Monument (Category A Rocks) as open for recreation by permit only, which would reduce potential impacts to cultural resources by controlling the amount of recreation allowed in those areas. As in alternatives B and D, all 25 recorded cultural sites would be within designated RMAs in this alternative.

The BLM would designate 11.3 miles of trail in the Monument for hiking; 3.5 of these miles would also be open to equestrian use. The BLM would close 3.6 miles of existing trail. The number of recorded cultural sites near to or crossed by trails (19) would be similar to the No Action Alternative. Trail miles in this alternative would decrease by 25 percent from the current route network. The BLM would consult with affected tribes and conduct cultural resource surveys of the proposed designated trail routes prior to implementation. Rerouting trails to avoid cultural sites and places important for traditional cultural practices would reduce potential impacts to tribal interests. Limiting visitor use to designated trails except for authorized purposes would reduce the potential for impacts to cultural sites and places important for traditional cultural practices. With the exception of Alternative A, the BLM would expect this alternative to reduce more impacts from recreation to cultural sites or places of importance for traditional cultural activities than the other alternatives.

Under this alternative, the BLM would allow camping only in existing designated sites only. RMAs with designated sites would include 13 known cultural sites, approximately half of the recorded sites in the Monument. Impacts to cultural sites and potentially places important for traditional cultural uses would continue to be concentrated at those locations.

Under Alternative C, the BLM would close 799 acres within the Monument to camping. This would prevent impacts from camping to approximately half of the recorded cultural sites in the Monument, as well as to places within these RMAs important for traditional cultural activities or other tribal interests.

Opportunities to inform, educate, and engage the public about tribal heritage and the important natural and cultural values associated with the Monument would be increased under this alternative and Alternative D, because educational and interpretive signage could be placed in locations throughout the Monument as necessary. The BLM could develop new visitor facilities through implementation-level planning and NEPA compliance. Development of educational and interpretive signs and visitor facilities focusing on tribal history and enrichment (e.g., a longhouse) could benefit tribal interests by informing and enhancing the public's understanding of the tribal heritage associated with the Monument.

Alternative D

Under Alternative D, the BLM would designate all potential RMAs. All areas within the Monument would be open to recreational use without a permit except for organized and commercial and competitive groups. As in alternatives B and D, all 25 recorded cultural sites would be within designated RMAs in this alternative. Opportunities for traditional and cultural practices requiring quiet and solitude likely would decrease under this alternative and conflicts with recreational activities would likely affect tribal enrichment programs and engagement.

The BLM would designate 23.4 miles of trail in the Monument for hiking; approximately 8 of these miles would be open to equestrian and bicycling use. Overall, trail miles in the Monument would increase by 54 percent under this alternative. The BLM would close 0.5 miles of trail existing trail and would develop 8.8 miles of new trails; it would widen 0.2 miles of existing trail. Similar to Alternative B, roads and trails in Alternative D would cross 23 recorded cultural sites in the Monument. The BLM expects that development of approximately 8.8 miles of new trails to result in at least an 18 percent increase in the number of recorded sites crossed by trails within the Monument. The BLM would consult with affected tribes and conduct cultural resource surveys of the proposed designated trail routes prior to implementation. Rerouting trails to avoid cultural sites and places important for traditional cultural practices would reduce potential impacts to tribal interests. The acreage of recorded cultural sites crossed by roads and trails would be highest in this alternative; it would be slightly higher (3 percent) than Alternative B and approximately 30 percent higher than the No Action Alternative.

As under all alternatives except for Alternative A, the BLM would continue to allow camping in designated sites at Blind, Patos, and Posey islands. Under this alternative, the BLM could develop new sites in these RMAs. The BLM would also designate an additional 221 acres of Monument land as open to designated site camping. In total, approximately 80 percent (20 sites) of all recorded cultural sites in the Monument would be in RMAs open to designated site camping. Authorizing new designated camping areas and visitor facilities would concentrate recreational activities in new locations and result in additional potential impacts to cultural sites and places important for traditional cultural uses. The BLM would identify specific locations for new designated sites and associated visitor facilities during plan implementation. The BLM would consult with affected tribes and conduct cultural resource surveys as part of the implementation-level planning process to identify new designated campsites. Locating campsites to avoid cultural sites and places important for traditional cultural practices would reduce potential impacts to tribal interests.

The BLM would allow dispersed camping on 167 acres of Monument land currently open to this use and on 370 acres of land currently closed to this use at Chadwick Hill and Point Colville. Opening areas currently closed to dispersed camping would increase the potential for long-term and direct impacts to cultural resources and places important for traditional cultural uses in these areas. Under Alternative D, RMAs open to dispersed camping would include six recorded cultural sites. The BLM would close the remainder of the Monument (49 acres) to camping. This would prevent adverse impacts from camping to two recorded cultural sites, as well as to places within these RMAs that are important for traditional cultural activities or other tribal interests.

Opportunities to inform, educate, and engage the public about tribal heritage and the important natural and cultural values associated with the Monument would be increased under this alternative and Alternative C, because educational and interpretive signage could be placed in locations throughout the Monument as necessary. The BLM could also develop new visitor facilities through implementation-level planning and NEPA compliance. Developing educational and interpretive signs and visitor facilities focusing on tribal history and enrichment (e.g., a longhouse) could benefit tribal interests.

Impacts from Vegetative Treatments

Under all alternatives, the BLM would implement vegetation treatments to protect human health and safety (i.e., hazard tree removal) and to control invasive plant species designated by Washington State for mandatory eradication or control. Where vegetation projects require planting and seeding, culturally important plants, such as camas, would be used in culturally and environmentally appropriate settings.

Vegetation treatments that affect the integrity of a site, location, or resource identified as important to one or more tribes for cultural continuity, as an Indian trust asset, or as integral to a treaty-based right or responsibility can impact tribal treaty rights and interests. Trees, shrubs, and forbs and their fruit, seeds, nuts, and bulbs are traditionally used by tribes for food, shelter, transportation, clothing, basketry, and medicines. Under all alternatives, vegetation treatments could impact some plants of traditional use to tribes.

Vegetation management can include mechanical, biological, chemical treatments and prescribed fire. While the BLM would undertake inventory prior to authorizing surface disturbing projects, vegetation treatments such as hand pulling, digging, surface scarring, tilling, or tree removal could directly impact undiscovered cultural resources and human remains by exposing buried material, causing surface erosion, and intruding into the cultural setting. Chemical treatments could leave residues on soils and plants within traditional plant collecting areas or potentially affect other cultural or archaeological materials. Prescribed fire could affect flammable cultural materials and artifacts, cause staining and spalling (i.e., fragmenting) of lithic artifacts or features such as pictographs, and distort site or artifact dating analyses. Any treatment that exposes cultural materials could increase potential unauthorized collection or vandalism of cultural resources. Opening areas to new and ground disturbing treatments can increase risks to previously undisturbed and fragile resources.

Vegetation management could also affect access or interfere with the exercise of traditional cultural uses, negatively impacting cultural resource values and opportunities to exercise treaty protected activities. Vegetation treatments that alter or change a cultural or natural setting—including though temporary visual and aural intrusions—in areas important for spiritual or other traditional practices would impact tribal interests. Long-term or permanent impacts would occur when archaeological or other important cultural sites are substantially damaged or destroyed.

Short-term impacts could result from treatments that temporarily block or impede access to or use of a traditional cultural property or other places important for traditional cultural practices. The various vegetation treatments would have variable durations and would temporarily limit access to the treatment areas during mobilization, operational and demobilizing periods for mechanical and fire treatments and during chemical herbicidal applications. Some chemical herbicidal applications may have short-term or long-term impacts to traditional plant gathering activities and uses. Some biological treatments would potentially have very short-term (i.e., duration of the project) impacts to access during the life of the projects.

If vegetation treatments are not implemented, noxious weeds and other invasive plants would continue to increase, forest health and wildlife habitats would continue to decline, and encroachment of grasslands and shrublands would continue, contributing to negative long-term impacts on the historic setting, the availability of plants for gathering, and other traditional uses and exercise of treaty rights. Under taking vegetation treatments also creates opportunities for tribes to work with the BLM to manage traditional gathering areas.

Under all alternatives, the BLM would address potential impacts to cultural resources and tribal interests at the design or implementation phase of future projects through consultation with affected tribes and National Historic Preservation Act Section 106 review. Consultation with tribes regarding tribal interests and potential impacts from proposed projects would be complimentary to Section 106 review and compliance. The BLM, in consultation with affected tribes and in consideration of tribal interests and rights, would avoid or minimize potential impacts to historic properties and other cultural resources and values important to tribal rights and interests.

No Action Alternative

Under the No Action Alternative, the BLM would continue custodial management of the BLM; the BLM assumes it would continue very limited vegetation treatments (approximately 400 acres over 20 years the Monument). Current trends in the plant communities would continue, including loss of native grassland and shrubland habitats, a decrease in species diversity, and an increase in invasive species. Loss of access to areas for traditional practices resulting from application of vegetation treatments would be minor. Over time, cultural resource values associated with traditional plant gathering and use may be diminished due

to continued encroachment by invasive plants and forest species into grasslands and shrublands and decline in forest health. This alternative would have the least potential risk for vegetation treatments to disturb cultural resources. It would also have the fewest opportunities for tribes to work with the BLM to implement vegetation treatments.

Alternative A

Under Alternative A, the BLM's management of vegetation would continue to be largely passive. Herbicides and prescribed fire would not be available for vegetation management. The BLM estimates that it would undertake approximately 650 acres of vegetation treatments over the life of the plan. Under this alternative, there would continue to be limited opportunities for tribes to work with the BLM to implement vegetation treatments, though such opportunities would be greater than under the No Action Alternative.

Access to project areas would be temporarily limited during mobilization, operation, and demobilization periods for mechanical treatments. The 390 acres of biological treatments the BLM estimates that it would undertake to achieve habitat and plant communities objectives over the life of the plan could temporarily affect access during the life of the projects.

Given that natural succession and other processes continue to the 50 percent threshold identified for vegetation treatments prior to treatment, the potential for direct impacts to cultural resources from vegetation treatments would be limited, though greater than under the No Action Alternative. Encroachment by native forest species into the grasslands and shrublands would continue and the condition of these communities would likely decline over time as a result of invasive plant treatment being undertaken in the absence of herbicides. This would result in a decline in the size and condition of grasslands and shrublands important for traditional plant gathering and other activities associated with traditional cultural practices (see Table 7 on page 75). The prohibition on recreation in the Monument, which would reduce though not eliminate visitor presence, could slow the introduction and spread of invasive plant species.

Alternative B

Under Alternative B, the BLM in consultation and collaboration with tribes and other partners would manage the Monument to enhance the San Juan Islands' ecological resistance and resilience by increasing the extent of native plant communities—specifically grasslands and wetlands—that are relatively scarce within the San Juan Islands as a whole. The BLM would also undertake vegetation treatments in the Monument to increase native species richness and structural component diversity to the extent that doing so is not detrimental to site-scale resilience. To achieve these objectives, the BLM would undertake vegetation treatments to thin forests and woodlands, as well as extensive grassland restoration (see Table 18 on page 112). This alternative would provide many opportunities for tribes to work with the BLM to implement vegetation treatments. Like alternatives C and D, the BLM would consider all tools in designing implementation-level vegetation treatments.

The magnitude and intensity of the vegetation control and restoration measures under Alternative B would create a relatively high potential for short-term and long-term impacts to cultural resources from disturbance, chemical treatments, and fire. Treatments would have the potential to inadvertently disturb or destroy artifacts and cultural features and their scientific context within archaeological sites located within the treatment area. Short-term impacts from vegetation treatments that temporarily block or impede access for traditional cultural practices or that would temporarily affect the historic or cultural setting would be more likely than under the No Action Alternative and alternatives A and D. The potential for long-term or permanent impacts from damage or destruction of archaeological or cultural sites and properties would be greater under this alternative than under the No Action Alternative, Alternative A, and Alternative D.

Vegetation treatments implemented to enhance native species richness and structural component diversity would have a positive long-term effect on diversity and cover of functional/structural group species, though some short-term negative impacts would occur. Over time, treatments to enhance and expand grasslands and shrublands would increase opportunities for traditional cultural uses.

Alternative C

Under Alternative C, the BLM in consultation and collaboration with tribes and other partners would manage the Monument to approximate the extent and condition of plant communities that existed prior to Euro-American settlement of the San Juan Islands (approximately 1860), when Native Americans used fire to manage landscapes. To achieve this objective, the BLM would undertake extensive grasslands and shrubland restoration within the Monument (see Table 19 on page 114). The BLM estimates this alternative would require the most acres of vegetation treatment over the life of the plan of any alternative other than Sub-Alternative C. This alternative would provide many opportunities for tribes to work with the BLM to implement vegetation treatments. As in alternatives B and D, the BLM would consider all tools in designing implementation-level vegetation treatments.

Impacts from vegetation treatments under Alternative C would be similar to under Alternative B, though the magnitude of both negative and positive impacts would be greater. Short-term impacts from vegetation treatments that temporarily block or impede access for traditional cultural practices or that temporarily affect the historic or cultural setting would be more likely than under the No Action Alternative and alternatives A, B, and D. Short-term and long-term negative impacts related to ground disturbance, prescribed fire, and chemical use would be similar to but greater than those described under Alternative B.

Vegetation treatments implemented to approximate historic conditions would have a major positive long-term effect on diversity and cover of functional/structural group species, though some short-term negative impacts would occur. Treatments would include intensive restoration efforts to remove non-native plants and restore native plants, including culturally important species. Over time, this would benefit cultural properties associated with traditional plant gathering and uses, increasing opportunities for these activities.

Sub-Alternative C

Under this alternative, the BLM in consultation and collaboration with tribes and other partners would work to achieve the objective for this alternative without herbicides and pesticides. Effects to cultural resources from vegetation treatments would be similar to, but greater in magnitude than, those under Alternative C. Without the use of herbicides, the BLM estimates that it would need to increase the repetition of mechanical treatments to meet the habitat and plant communities objectives (see Table 20 on page 115). Short-term and long-term negative impacts related to ground disturbance would be similar to but greater than those described under Alternative C. Positive long-term increases in opportunities for traditional plant gathering would be the same under this alternative as under Alternative C.

Short-term impacts from vegetation treatments that temporarily block or impede access for traditional cultural practices or that would temporarily affect the historic or cultural setting would occur most frequently under this alternative. The prohibition on chemical treatments would reduce impacts to traditional plant gathering activities and uses associated with traditional cultural properties and other tribal interests.

Alternative D

Under Alternative D, the BLM would maintain the approximate extent and condition of plant communities that it documented in the Monument as of 2016. The BLM estimates that this would require more acres of vegetation treatment than would occur under the No Action Alternative and Alternative A and substantially fewer acres than would be required to meet objectives and management direction under alternatives B, C, and Sub-C. Under this alternative, there would be fewer opportunities for tribes to work with the BLM to implement vegetation treatments than under alternatives B, C, and Sub-C, but more than under the No Action Alternative and Alternative A. Like in alternatives C and B, the BLM would consider all tools in designing implementation-level vegetation treatments.

Vegetation treatments would target the edges of grasslands and shrublands to prevent conversion to forest and woodlands; they would also target new or expanding invasive plant populations. Through active management, the extent of grassland and shrubland plant communities would remain at their approximate 2016 extent instead of decreasing over the life of the plan as they would under the No Action Alternative

and Alternative A. The condition of areas of traditional cultural importance for plant gathering and use would remain relatively unchanged though conditions in forests and woodlands would continue to be mostly closed and crowded. The potential for direct impacts to cultural resources would be limited though greater than in the No Action Alternative or Alternative A. While vegetation management would limit encroachment of forest vegetation into grasslands and shrublands, the condition of cultural properties important for traditional plant gathering would not improve or expand as they would under alternatives B, C, and Sub-C.

Summary Conclusion for Tribal Interests

Under all alternatives, the BLM would collaboratively engage with tribal government partners to facilitate traditional uses, develop opportunities for co-stewardship of plant communities and culturally important plants, engage tribal youth and elders, and maintain and improve access for exercise of treaty rights and traditional cultural practices. Through engagement with the tribes, BLM would foster programs to enrich opportunities for tribal cultural, spiritual, and educational activities including projects to restore Salish place names within the Monument.

Beyond these common to all approaches, the alternatives would vary in their effects on tribal interests within the Monument. Specifically, they would vary in terms of the potential for short-term and long-term effects from disturbance from recreation activities and vegetation management to cultural settings and traditional practices. They would also vary in the extent to which they would improve conditions for traditional cultural practices including plant gathering and hunting.

Alternative A would have the least potential for impacts to cultural sites and settings from either recreational activities or vegetation treatments. Similarly, it would have the least potential for physical, visual, or aural conflict between vegetation management or visitor activities and traditional practices. Alternative C would have a substantially greater potential risk for impacts from recreation and vegetation treatments than Alternative A. It would provide relatively minimal recreational opportunities and so would have the second least potential for conflict between vegetation management or visitor activities and traditional practices. Alternatives B, Sub-C, and D would have the greatest potential for impacts to cultural sites and traditional cultural practices from recreation and vegetation management. Consulting with tribes and conducting cultural resources surveys prior to authorizing activities that may adversely affect cultural sites or places important for traditional cultural practices or exercise of treaty rights would reduce potential impacts to tribal interests.

While alternatives B, C, and sub-C would have a greater potential for disturbance to cultural sites and settings due to vegetation treatments than the No Action Alternative and alternatives A and D, they would substantially increase the quantity and quality of grassland and shrubland plant communities within the Monument. This would increase opportunities for both collecting culturally-important grassland plants, such as camas, and for tribes to work with the BLM to implement vegetation treatments. Alternative C would go the furthest toward approximating pre-Euro-American settlement vegetation conditions within the Monument and would provide the most opportunities for gathering of grassland plants and co-stewardship opportunities with the BLM. The No Action Alternative and alternatives A and D would have lower potential for impacts from vegetation treatments but would have minimal benefits to plant communities important for many traditional cultural practices.

In summary, different alternatives would most benefit different aspects of tribal interests. Among the alternatives, Alternative A would have the least potential for short-term and long-term impacts from vegetation management and recreational activities to cultural resources and settings. Alternative C, on the other hand, would most expand opportunities for cultural and traditional practices by improving the condition and extent of plant communities important for plant gathering and wildlife.

Cumulative Effects on Tribal Interests in the San Juan Islands[59]

The Monument's contribution to lands available for exercising Native American treaty rights and traditional cultural practices is relatively small, but important given the limited lands that are currently

[59] See Cultural Resources Issue 1 for analysis of the direct, indirect, and cumulative effects of shoreline stabilization on cultural sites and resources important to tribal interests.

available for these activities in the San Juan Islands. The Monument includes approximately 4 percent of the public lands in the San Juan Islands and approximately 0.8 percent of the total land area in the San Juan Islands. Opportunities to access and exercise tribal rights and interests vary among the land managing jurisdictions. About 6 percent of the recorded cultural sites in the San Juan Islands are located in the Monument. Given that the great majority of the land in the archipelago is privately owned, the Monument can play an important role in providing opportunities for tribal members to access lands for traditional and spiritual practices.

Healthy habitats for fish and wildlife and access to locations of traditional procurement activities are essential to the exercise of treaty rights and tribal interests. Opportunities to exercise treaty rights, as well as the availability of resources, have diminished in the San Juan Islands, as well as in the rest of region, since the signing and ratification of tribal treaties and agreements. Increased settlement and changes in land use practices, including agriculture, dams, irrigation, ranching, and resource extraction, continue to alter the landscape and natural habitats. Ongoing loss of habitat and fish, particularly salmon, are of particular concern (Treaty Indian Tribes in Western Washington 2011). Decreased availability of culturally and economically important resources such as native fish (including salmon and shellfish), game, and plant species and loss of access to areas of traditional use adversely affect the traditional socio-cultural activities and practices essential to the exercise of treaty rights and tribal interests.

Grasslands in the Puget Lowland Ecoregion, which includes the San Juan Islands, have declined to an estimated 9 percent of pre-Euro-American settlement levels (Chappell et al. 2000). The Monument currently encompasses approximately 1 percent of the Southern Vancouverian Lowland Grassland and Shrubland occurring within the San Juan Islands; the great majority of lands in the San Juan Islands are in private ownership and are not available for the gathering of culturally important plants. Cumulative effects to grasslands, which have the potential for collection of culturally important plants, are discussed under Habitat and Plants Issue 2.

Under alternatives B, C, and Sub-C, the BLM would substantially increase the quantity and quality of grassland and shrubland plant communities within the Monument. Under the No Action Alternative and Alternative A, the quality and quantity of these important communities would continue to decline in the Monument, decreasing the overall availability of opportunities for culturally important plant gathering in the San Juan Islands. Under these alternatives, the Monument would contribute to, rather than counter, the decline in grassland communities in the San Juan Islands. The limited land available for the practice of traditional cultural activities within the San Juan Islands makes the availability of these lands within the Monument particularly important to tribal interests.

The alternatives would differ in their effect on the Monument's contribution to the total cultural sites in the San Juan Islands. They would differ in accordance with the magnitude of the potential for these resources to be disturbed or lost due to recreation activities and vegetation management. Under all alternatives, there would be some potential for disruption or loss of cultural sites due to shoreline erosion and storm surge, visitor use, and vegetation management. Alternatives B, Sub-C, and D would have the greatest potential for a reduction in the Monument's contribution to the total number of cultural sites in the San Juan Islands.

Visual Resources

Key Points

- Under alternatives A and D, the BLM would manage all acres within the Monument at a VRM class that is more restrictive or equivalent to the current VRI class.
- Under alternatives B and C, the BLM would manage most of the Monument at a VRM class that is less restrictive than the current VRI class.
- Under all alternatives, the Monument's overall visual value is expected to remain at VRI Class II (high) even where a higher VRM class is designated and scenic quality would be at least temporarily reduced due to vegetation treatments.

This section contains one analytical issue:

1. How would the BLM's designation of visual resource management classes under each alternative affect visual resources? For lands where the BLM would designate visual resource management class as lower than the visual resource inventory class, how would vegetation treatments and potential recreation developments affect the visual resources? (Page 226)

Visual Resources Analytical Issue 1: *How would the BLM's designation of visual resource management classes under each alternative affect visual resources? For lands where the BLM would designate visual resource management class as lower than the visual resource inventory class, how would vegetation treatments and potential recreation developments affect the visual resources?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

In 2010, the BLM completed a visual resources inventory for the Monument. After considering the factors described below, the BLM rated the whole of the Monument as having VRI Class II (high) visual resource values. Since there is no RMP for the Monument, there are no current VRM classes.

In reaching the VRI determination, the BLM determines an area's scenic quality (rated as A, B, or C) and the "distance zones" from which the areas in question are likely to be viewed from travel routes or observation points (e.g., are they typically viewed as foreground, middleground, or background?). The BLM considered the fact that most of the Monument is viewable from smaller private and commercial craft and that several Monument properties are viewable from the Washington State ferries serving the San Juan Islands. The Monument lands offer stunning vistas of wildflowers and lush vegetation, rocky bluffs, open prairie, tide-pools, rocky and sandy beaches, and barren rocks colored with brilliant displays of dust lichens and seaweeds, as well as several historic buildings. These qualities led the BLM to determine that the Monument has a scenic quality ranking of A and falls within the foreground-middleground distance zone.

For the most part, Monument lands are relatively natural in appearance. The portions of the Monument that are not easily accessible by the public due to a lack of ferry service or legal access have generally retained a higher level of natural appearance. The degree of impacts from human use varies with the amount of use and the accessibility of the areas.

The BLM determined that the Monument has a high sensitivity rating due to the type of users, amounts of use, public interest, adjacent land uses, and the fact that many residents and visitors consider Monument lands to be special areas. This rating is the highest level of sensitivity the BLM can identify during the inventory process. The type of users experiencing the Monument ranges from local residents to visitors coming from across the world. Many of the individuals who live in the San Juan Islands choose this area for the natural setting, remoteness, and predominantly undeveloped landscape.

The BLM estimates that the Monument received over 100,000 visitors in 2014 (see Table 37 on page 156), though the amount of use varies substantially by location and is difficult to ascertain with precision for remote and scattered rocks and islands. Well over a million people utilize the Washington State Ferry to access the San Juan Islands every year (Washington State Department of Transportation 2015). Numerous private vendors operate watercraft and flight services that allow residents and visitors to experience the area's natural setting, remoteness, and predominantly undeveloped landscape. The public interest in the seascape and landscape of the San Juan Islands is high and prompted the 2008 designation of the San Juan Islands Scenic Byway, which includes the ferry route and designated roads on San Juan Island and Orcas Island.

Although the BLM does not identify VRI or VRM classes for private lands, it does consider each location's overall viewshed, including adjacent public and private lands, when undertaking the inventory. Thus, the BLM considered the sensitivity of the adjacent public and private lands during the inventory process. The majority of lands adjacent to the Monument are headlands, shorelines, rocks, and islands with undeveloped and natural settings. Some adjacent lands are under conservation easements held by a

local land bank and or by non-profit land trusts. These conservation easements typically limit development. Even where no conservation easement exists, adjacent landowners often manage lands to retain the landscape's naturalness and undisturbed setting. The San Juan County Shoreline Master Plan establishes coastal development setbacks to retain the area's natural setting (San Juan County 2016b). The Monument also shares common borders, waterways, and or overall scenic foreground, middleground, and background vistas with numerous other protected public lands. These areas include preserves, natural resource conservation areas, wilderness areas, national historical parks, and Canadian national parks.

Effects of the Alternatives

The alternatives vary in the acres of Monument land the BLM would designate under the various VRM classes. They also vary in the likelihood that there would be long-term impacts to visual resources that would change scenic quality where the BLM would designate a lower VRM class. Under all alternatives, including the No Action Alternative, the overall visual value of Monument landscapes is expected to remain at VRI Class II (high)—even where repeated vegetation treatments may reduce scenic quality from A to B—because public sensitivity to visual change would remain high and all areas will remain within the foreground-middleground distance zone.

The BLM would develop trails and shoreline stabilization projects in a manner that allows these projects to meet VRM II objectives. The BLM could use local materials and location-appropriate colors and sight lines to bring these projects into compliance with VRM II objectives.

Table 56: Visual resource management designations by alternative (see Map 3 -Map 5, below)

VRM Class	No Action Alternative (acres)	Alternative A (acres)	Alternative B (acres)*	Alternative C (acres)*	Alternative D (acres)
Class I	0	232	0	3	232
Class II	0	789	28	28	789
Class III	0	0	992	989	0
Class IV	0	0	0	0	0
Undesignated	1,021	0	0	0	0

* Totals only 1,020 acres due to a rounding issue (i.e., the acres falling into two of the classes round down instead of up while under other alternatives the acres round up).

Table 57: Percent of acres the BLM would manage at a visual resource management class that is more or less restrictive than the current visual resources inventory class

	No Action Alternative	Alternative A (percent)	Alternative B (percent)	Alternative C (percent)	Alternative D (percent)
Percent acres less restrictive (more contrast allowed) VRM than VRI	NA	0%	97%	97%	0%
Percent acres more restrictive (less contrast allowed) VRM than VRI	NA	23%	0%	<1%	23%
Percent acres equivalent VRM and VRI	NA	77%	3%	3%	77%

No Action Alternative

Under the No Action Alternative, there would continue to be no designated VRM classes in the Monument. Given that the BLM's custodial management approach would continue under this alternative, it is unlikely that management activities would substantially affect visual resources outside of the duration of a project (e.g., visual resources would be temporarily affected by hazard tree removal, but there would be no change in the visual character of the area after the completion of the project). Increasing recreation under the minimal visitor use restrictions currently in place, could eventually affect visual resources, including through the continued proliferation of user created trails causing increasingly noticeable contrast in line, color, and texture.

Alternative A (Map 3)

Under Alternative A, the BLM would designate 232 acres of Monument lands as VRM Class I[60]. The BLM would manage visual resources in this 23 percent of the Monument more restrictively than the existing VRI Class. The VRM Class I designation would require all projects in those areas to not be visible or attract attention; projects would have five years to come into compliance with this objective (e.g., a vegetation treatment could have short-term visual impacts as long as they became negligible within five years).

Under this alternative, the BLM would designate 789 acres of Monument lands as VRM Class II. The BLM would manage visual resources in this 77 percent of the Monument at a VRM class that is equivalent to the current VRI class. The VRM Class II designation would allow projects to be visible but not attract attention; projects would have five years to come into compliance with this objective.

Under this alternative, the Monument would retain A-quality scenery and high visual sensitivity, thus maintaining overall VRI Class II values.

Alternative B (Map 4)

Under Alternative B, the BLM would designate 28 acres of Monument lands as VRM Class II. The BLM would manage visual resources in this 3 percent of the Monument at a VRM class that is equivalent to the current VRI class. The VRM Class II designation would allow projects to be visible but not attract attention; projects would have five years to come into compliance with this objective (e.g., a vegetation treatment could have short-term visual impacts as long as they became negligible within five years).

Under this alternative, the BLM would designate 992 acres of Monument lands as VRM Class III. The BLM would manage visual resources in this 97 percent of the Monument at a VRM class that is less restrictive than the current VRI class. The VRM Class III designation would allow projects to attract attention but not dominate the view. This would allow the BLM to repeat vegetation treatments within a five-year period as necessary to meet Alternative B's vegetation objectives. The BLM assumes that the scenic quality in many of these areas would shift from A to B during the life of the plan, primarily due to changes in vegetation and color and cultural modification scores. However, the long-term (i.e., more than the life of the plan) visual impacts of vegetation treatments would become minimal once the repetition rate of treatments declined either due to new plan-level decisions or due to a reduction in need to repeat treatments to achieve objectives over time (e.g., once grassland species are fully established in formerly forested areas). The BLM would not allow new recreational developments under this alternative.

Under this alternative, although scenic quality in some areas would drop from A to B, visual sensitivity levels would remain high and, with no change in distance zones, VRI would remain Class II.

Alternative C (Map 5)

Under Alternative C, the BLM would designate areas managed for their wilderness characteristics (3 acres) as VRM Class I. The BLM would manage visual resources in this <1 percent of the Monument more restrictively than the existing VRI Class. The VRM Class I designation would require all projects in those areas to not be visible or attract attention; projects would have five years to come into compliance with this objective (e.g., a vegetation treatment could have short-term visual impacts as long as they became negligible within five years).

Under this alternative, the BLM would designate 28 acres of Monument lands as VRM Class II. The BLM would manage visual resources in this 3 percent of the Monument at a VRM class that is equivalent to the current VRI class. The VRM Class II designation would allow projects to be visible but not attract attention; projects would have five years to come into compliance with this objective (e.g., a vegetation treatment could have short-term visual impacts as long as they became negligible within five years).

The BLM would designate 989 acres of Monument lands as VRM Class III. The BLM would manage visual resources in this 97 percent of the Monument at a VRM class that is less restrictive than the current VRI class. The VRM Class III designation would allow projects to attract attention but not dominate the

[60] Managing VRI Class II lands at a VRM Class I does not indicate that there are existing visual disturbances that need to be removed. The VRM class restricts how the BLM implements projects going forward.

view. This would allow the BLM to repeat vegetation treatments within a five-year period as necessary to meet Alternative B's vegetation objectives. The BLM assumes that the scenic quality in many of these areas would shift from A to B during the life of the plan, due to changes in vegetation and color and cultural modification scores. However, the long-term (i.e., more than the life of the plan) visual impacts would be the same as described under Alternative B.

The BLM would allow for the development of new recreation facilities under this alternative. It would minimize visual impacts from these developments through site selection and the use of local materials and location appropriate colors and sight lines.

Under this alternative, although scenic quality in some areas would drop from A to B, visual sensitivity would remain high and, with no change in distance zones, VRI would remain Class II.

Alternative D (Map 3)

Under Alternative D, the BLM would designate areas managed for their wilderness characteristics (232 acres) as VRM Class I. The BLM would manage visual resources in this 23 percent of the Monument more restrictively than the existing VRI Class. The VRM Class I designation would require all projects in those areas to not be visible or attract attention; projects would have five years to come into compliance with this objective (e.g., a vegetation treatment could have short-term visual impacts as long as they became negligible within five years).

Under this alternative, the BLM would designate 789 acres of Monument lands as VRM Class II. The BLM would manage visual resources in this 77 percent of the Monument at a VRM class that is equivalent to the current VRI class. The VRM Class II designation would allow projects to be visible but not attract attention; projects would have five years to come into compliance with this objective (e.g., a vegetation treatment could have short-term visual impacts as long as they became negligible within five years). The BLM would allow for the development of new recreation facilities under this alternative. It would minimize visual impacts from these developments through site selection and the use of local materials and location appropriate colors and sight lines.

Under this alternative, the Monument would retain A-quality scenery and high visual sensitivity, thus maintaining overall VRI Class II values.

Conclusion

Under alternatives A and D, the BLM would manage all acres within the Monument at a VRM class that is more restrictive or equivalent to the current VRI class. These alternatives would have a negligible to positive impact on visual resources. Under alternatives B and C, the BLM would manage most of the Monument at a VRM class that is less restrictive that the current VRI class. Over the life of the plan, vegetation management would create visual contrast that would not resolve within five years due to the frequency of treatment repetition required to meet these alternatives' objectives. Once the repetition of vegetation treatments declines, visual resources should return to their current VRI classes.

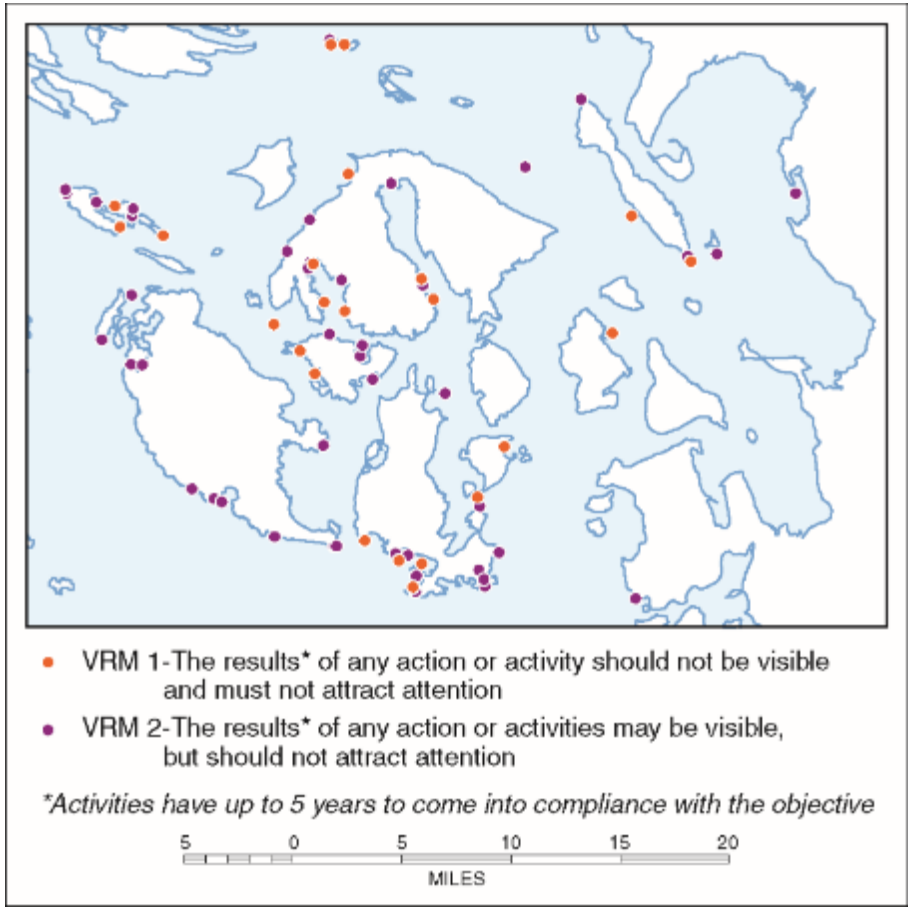
Under all alternatives, the Monument's overall visual value of the Monument landscapes is expected to remain at VRI Class II (high)

Cumulative Effects of the Alternatives for Visual Resource Management

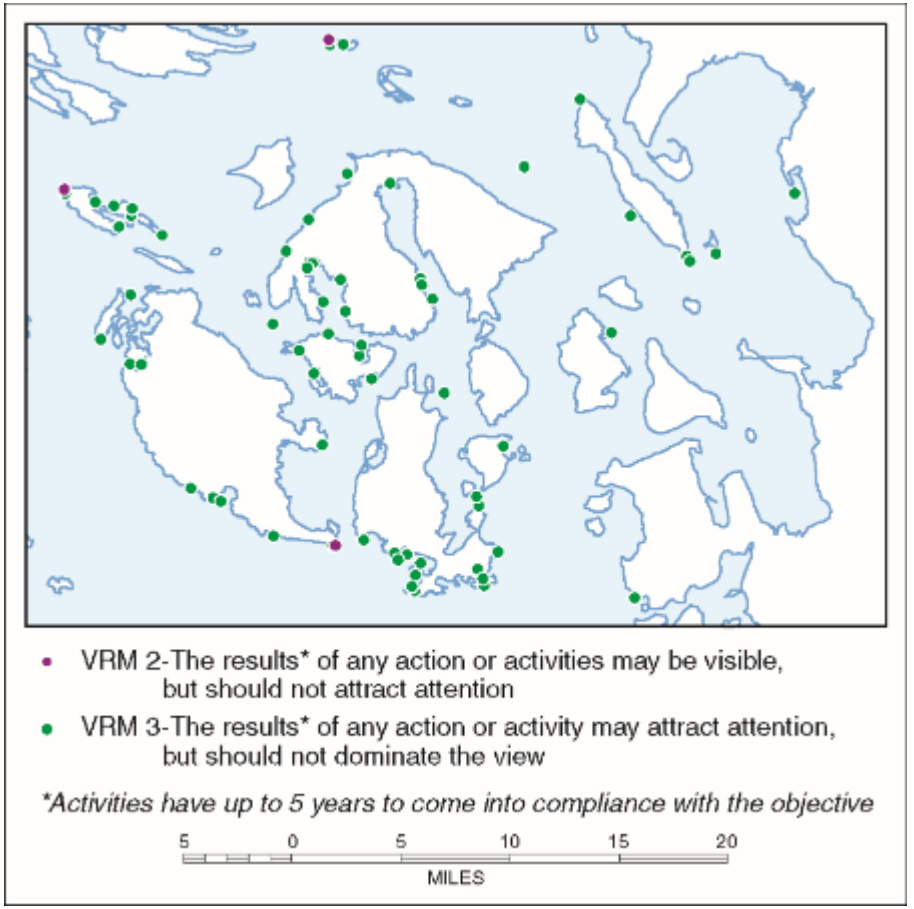
As described in the affected environment section above, the San Juan Islands have high-quality and highly valued visual resources. Current management of these lands on both public and private lands is maintaining the high-quality of these visual resources. There are no reasonably foreseeable management changes that would substantially affect the visual resources of the San Juan Islands.

Under all alternatives, the visual sensitivity of the San Juan Islands would remain high and, with no change in distance zones, overall VRI would remain Class II. Under alternatives B and C, vegetation management within the Monument would lead to a noticeable, but not dominant, change to the visual resources on approximately 0.3 percent of land in the San Juan Islands. Under all other alternatives, the Monument would continue to contribute to the highly valued scenic resources of the San Juan Islands.

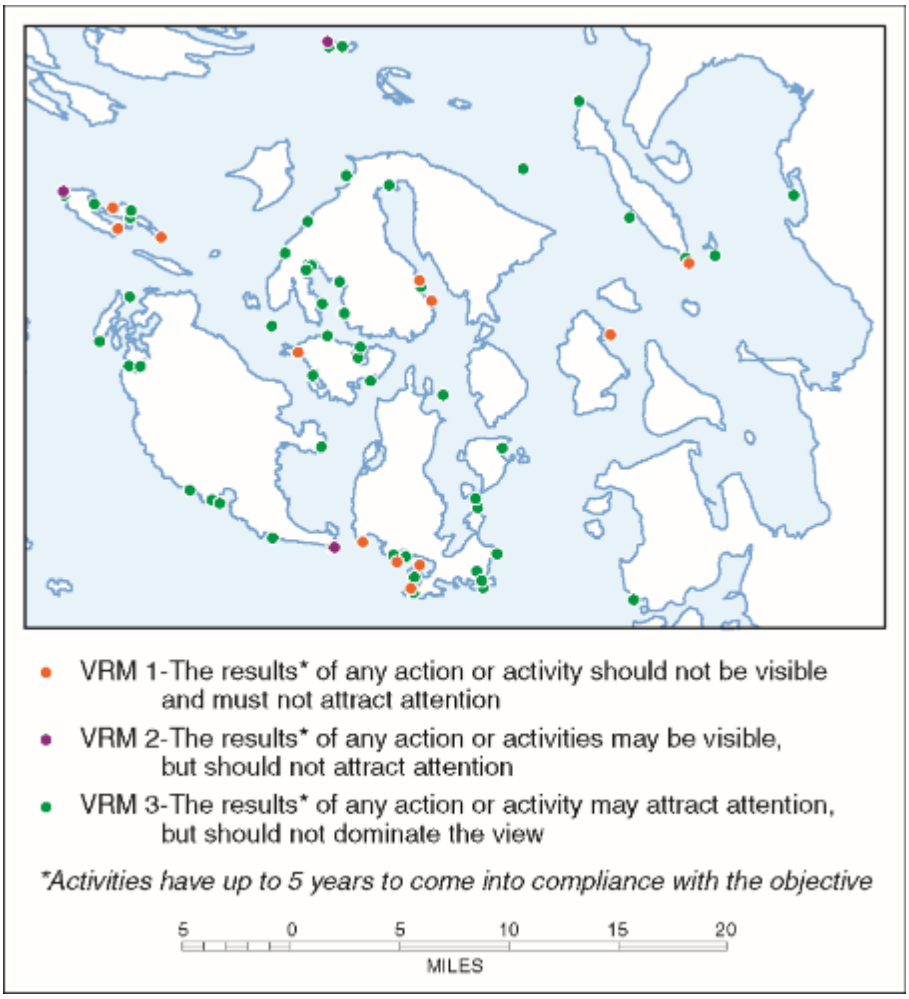
Map 3: VRM Classes under alternatives A and D



Map 4: VRM Classes under Alternative B



Map 5: VRM classes under Alternative C



Wilderness Characteristics

Key Points

- Under alternatives A and D, the BLM would manage all areas found to possess wilderness characteristics explicitly for these characteristics and would contribute to the total acreage and number of rocks and islands managed for wilderness characteristics in the San Juan Islands.
- Under the No Action Alternative and Alternative B, the BLM would continue not to manage these areas explicitly for these characteristics.

This section contains one analytical issue:

1. How would the alternatives affect wilderness characteristics within the Monument? (Page 232)

Background

The BLM is mandated by law to maintain an up-to-date inventory of wilderness characteristics on the lands it administers that are not currently designated as wilderness areas or wilderness study areas. It must also analyze impacts to this resource when undertaking actions and consider whether to manage these areas for their wilderness characteristics in its management plans. See the Wilderness Characteristics section of Appendix E for more information on the BLM's inventory process.

Wilderness Characteristics Analytical Issue 1: *How would the alternatives affect wilderness characteristics in the Monument?*

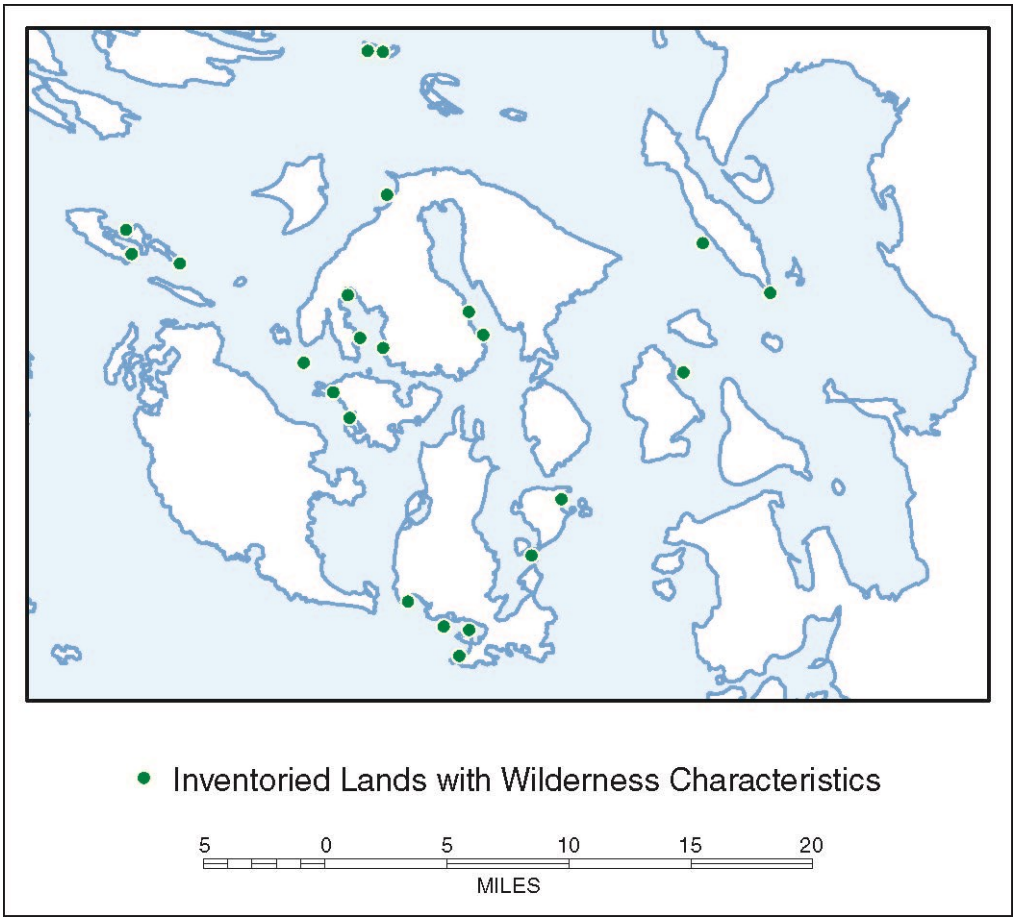
See Appendix B for analytical methods used in this analysis.

Affected Environment

Currently, there are 23 areas within the Monument (totaling approximately 232 acres) found by the BLM to have wilderness characteristics (see Map 6). Each area generally appears to have been affected by the forces of nature, with the imprint of man's work substantially unnoticeable; has outstanding opportunities for solitude; and may contain ecological, geological, or other features of scientific, educational, scenic, or historical value. There is no minimum size criterion for islands surrounded by water. See the Wilderness Characteristics section of Appendix E for additional information about the wilderness characeristics inventory.

The areas within the Monument that have been determined to have wilderness characteristics are: Carter Point Rocks, Davis Bay Island and Rocks, Eastsound Blind Island South, John's Island Rocks, Patos Island (east side only), Fauntleroy Rock, Freeman Island, Little Patos Island, Lummi Rocks, MacKaye Harbor Rocks, McConnell Rocks, Oak Island, Park Bay Island, Reads Bay Island, Reid Harbor Rock, Satellite Island Rocks, Skull Island, Twin Rocks, Victim Island, Unnamed Rocks (Cone Island), Unnamed Rocks (Iceberg Point Rocks), Unnamed Rocks (Shaw Island), Unnamed Rocks (South Lopez Island). The largest area identified as having wilderness characteristics is the east side of Patos Island, which encompasses 194 acres. Little Patos Island and Lummi Rocks are 14 and 8 acres respectively. Many of the smaller islands are less than 2 acres; many of the rocks and rock groupings are under an acre.

Map 6: Areas with wilderness characteristics identified through BLM inventory



Effects of the Alternatives

The alternatives vary in the areas the BLM would manage for wilderness characteristics. They also vary in the likelihood that wilderness characteristics would continue to exist where not explicitly managing for.

Table 58: Acres and areas managed for their wilderness characteristics

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Acres managed for wilderness characteristics	0	232	0	3	232
Individual rocks and islands managed for wilderness characteristics	0	23	0	12	23

No Action Alternative

Under the No Action Alternative, there would continue to be no plan decisions related to wilderness characteristics. Assuming the continuation of the current low level of management activity and visitor facility development, wilderness characteristics would persist under this alternative.

Alternatives A and Alternative D

Under both alternatives A and D, the BLM would manage all 23 rocks and islands (encompassing 232 acres) with wilderness characteristics for these characteristics (see Map 6). Under both alternatives, the BLM would not develop visitor facilities within these areas and would allow develop signs only as needed to protect values and human health and safety. It would also designate lands with wilderness characteristics as VRM Class 1, which would require any activity to create negligible visual contrast (see page 225 for more information). There would be modest to no vegetation treatments within areas with wilderness characteristics over the life of the plan under these alternatives. Under Alterantive D, the BLM would prohibit the use of hard stabilization in areas with wilderness characteristics (under Alterantive A, hard stabilization would not be allowed in the Monument).

Alternative B

Under Alternative B, the BLM would continue not to manage any areas with wilderness characteristics explicitly for these characteristics. Under this alternative, the BLM would undertake actions to protect or restore cultural and ecological values that would conflict with the protection of wilderness characteristics. The BLM would allow hard shoreline stabilization to protect cultural and paleontological resources where soft stabilization measures would be ineffective. While the BLM would minimize impacts from this action, hard stabilization measures could permanently disrupt the apparent naturalness of an area with wilderness characteristics. Under this alternative, there would also be a high repetition rate of vegetation treatments to achieve objectives over the life of the plan. While vegetation treatments would only temporarily disrupt apparent naturalness, the high repetition rate expected under this alternative would frequently disrupt this characteristic during the life of the plan in areas identified for restoration.

While the BLM would not manage any areas for wilderness characteristics, it is likely that these characteristics would persist in at least some locations over the life of the plan. The BLM would only implement hard stabilization where soft stabilization measure would be ineffective. It is likely that the BLM would implement these measures in, at most, a small percent of the areas with wilderness characteristics. The effects on apparent naturalness from vegetation treatments would be negligible once the repetition rate of treatments declined, either due to new plan-level decisions or due to a reduction in need to repeat treatments to achieve objectives over time (e.g., once grassland species are fully established in formerly forested areas).

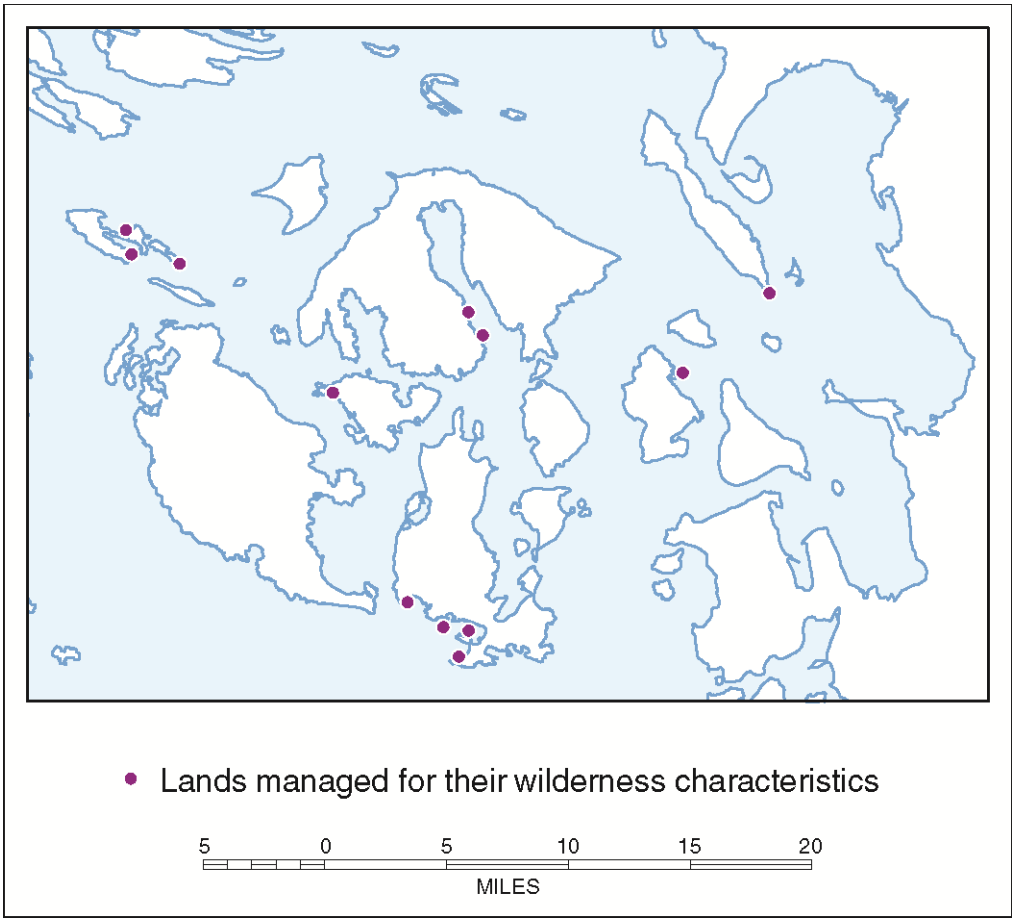
Alternative C

Under Alternative C, the BLM would manage rocks with wilderness characteristics explicitly for their wilderness characteristics. This would result in the BLM managing the following 12 rocks encompassing

3 acres for wilderness characteristics (see Map 7): Carter Point Rocks, Davis Bay Island and Rocks, Eastsound Blind Island South, John's Island Rocks, MacKaye Harbor Rocks, McConnell Rocks, Reid Harbor Rock, Satellite Island Rocks, Unnamed Rocks (Cone Island), Unnamed Rocks (Iceberg Point Rocks), Unnamed Rocks (Shaw Island), Unnamed Rocks (South Lopez Island). The BLM would not develop visitor facilities in these areas and would designate them as VRM Class 1 (see page 225 for more information). Given their small size and limited vegetation, these areas would likely undergo modest to no vegetation treatments.

Under this alternative, there could be a high repetition rate of vegetation treatments in the 229 acres not managed for their wilderness characteristics. As described under Alternative B, vegetation treatments would repeatedly disrupt apparent naturalness during the life of the plan, but the effects would be negligible once the repetition rate of treatments declined.

Map 7: Areas managed for their wilderness characteristics under Alternative C



Conclusion

Table 58 quantitatively compares the acres and number of areas the BLM would explicitly manage for wilderness characteristics across the alternatives. Table 59 qualitatively summarizes the effects of the alternatives on wilderness characteristics. It describes each alternative as causing an improvement, decline, or no change (+,-,=) in protection of wilderness characteristics compared to current conditions.

Alternatives A and D are the most protective of wilderness characteristics; the BLM would manage all areas with wilderness characteristics explicitly for these characteristics. Under the No Action Alternative and Alternative B, the BLM would continue not to manage these areas explicitly for these characteristics. Under Alternative C, the BLM would manage all of the rocks, but none of the islands, that have wilderness characteristics for these characteristics.

Table 59: Summary of alternatives' impacts on wilderness characteristics

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Acres managed for wilderness characteristics	=	+	=	+	+
Potential condition of wilderness characteristics outside of areas explicitly managed for them.	=	All 232 acres managed for wilderness characteristics	-	-	All 232 acres managed for wilderness characteristics

Cumulative Effect of BLM Management on Wilderness Resources in the San Juan Islands

While only Congress can designate wilderness, the alternatives would vary in their contribution to areas managed for their wilderness characteristics in the San Juan Islands. There is currently one wilderness area designated by the U.S. Congress in the San Juan Islands. No other areas are currently explicitly managed for wilderness characteristics, as defined by the Wilderness Act of 1964 (16 USC 1132). Other than the Monument planning process, there are no reasonably foreseeable changes to the amount of land managed explicitly for wilderness characteristics in the San Juan Islands.

In 1976, the U.S. Congress designated the San Juan Wilderness, which includes 80 rocks and islands totaling 353 acres; these rocks and islands are also part of the San Juan Islands National Wildlife Refuge managed by the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service has closed the majority of the San Juan Wilderness to public access. As a result, access to outstanding opportunities for solitude and primitive and unconfined recreation are very limited in the San Juan Wilderness.

Figure 7 demonstrates the Monument's contribution to land managed for wilderness characteristics in the San Juan Islands under each alternative. Under the No Action Alternative and Alternative B, the San Juan Wilderness would continue to be the only land managed explicitly for wilderness characteristics in the San Juan Islands. Under alternatives A and D, the Monument would provide the largest contribution to the land managed for wilderness characteristics. Under these alternatives, there would be a total of 582 acres in the San Juan Islands managed for wilderness characteristics. Under Alternative C, there would be a total of 356 acres in the San Juan Islands managed for wilderness characteristics.

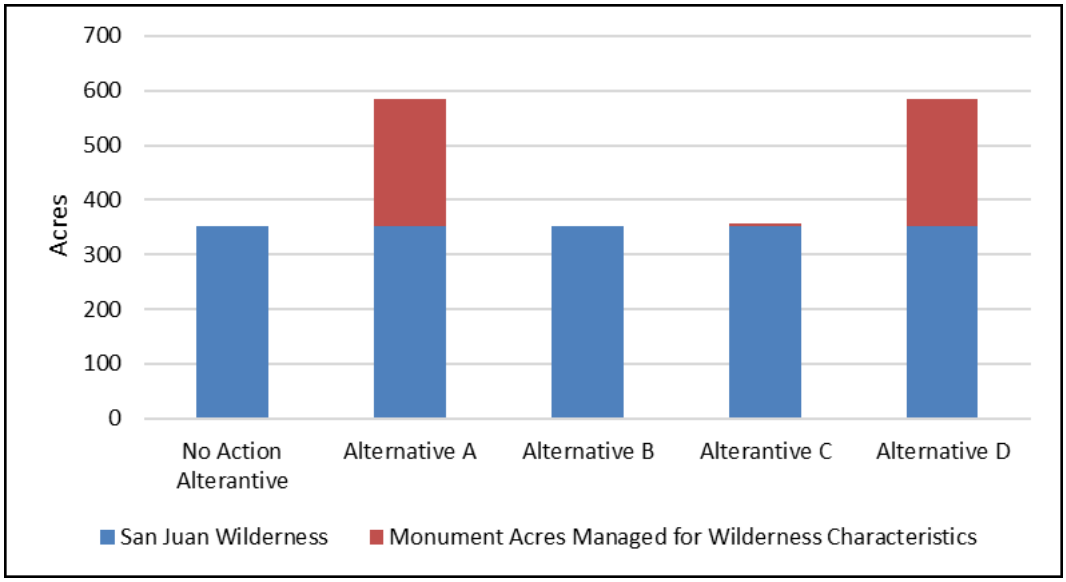


Figure 7: Acres managed for wilderness characteristics in the San Juan Islands by alternative

Wildfire

Key Points

- The No Action Alternative and alternatives A and D would likely lead to higher fire risks, lower protection or maintenance of fire-dependent Monument objects and values, and increased risks to adjoining properties.
- Alternatives B and C would likely reduce fire risks, maintain or enhance fire-dependent Monument objects and values, and reduce risks to adjoining properties.
- In general, the dispersed nature of Monument locations limits the effect of the alternatives on the overall wildfire risk in the San Juan Islands.

This section contains one analytical issue:

1. How would alternatives affect fire behavior and risks to Monument objects and values or adjoining lands? (Page 236)

Wildfire Analytical Issue 1: *How would alternatives affect fire behavior and risks to Monument objects and values or adjoining lands?*

Analysis of impacts from prescribed burning under the alternatives are found in the air quality, climate change, soils, vegetation, and wildlife sections of this chapter. See Appendix B for analytical methods used in this analysis.

Affected Environment

Monument lands are scattered throughout the San Juan Islands, so the BLM assumed that conditions within the Monument are essentially the same as throughout the undeveloped portions of the islands. Thus, the conditions described apply equally to the San Juan Islands as a whole and to the Monument.

Numerous fire history studies and historical accounts indicate that grasslands and oak-Douglas-fir savannas and woodlands, with only small patches of forest, dominated the San Juan Islands prior to the 20th century (Anonymous 1868, Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011). Given the lack of lightning-caused fires in the 20th century within the San Juan Islands, human ignitions were likely the dominant ignition source, which is consistent with historical accounts (e.g., Anonymous 1868, Avery 2004). Burning by Native Americans/Indigenous Peoples to maintain certain plants, such as camas, and plant communities, such as oak woodlands and savannas, is the likely reason for such conditions (Avery 2004, McDadi and Hebda 2008, Pellatt and Gedalof 2014). Further, pre-Euro-American settlement fire scarring occurred in late summer and fall (Sprenger and Dunwiddie 2011, Pellatt and Gedalof 2014), consistent with humans as the primary ignition source. However, extensive heart rot in most fire-scarred trees makes reconstructing historical fire frequencies difficult (e.g., Gray and Daniels 2006).

Fire return intervals apparently varied somewhat between islands. Dunwiddie et al.(2011) found that prior to Euro-American settlement, fire return intervals on Waldron Island averaged 7 to 18 years between fires on individual trees; Peterson and Hammer (2001) found similar results at Mount Constitution on Orcas Island. Spurbeck and Keenam (2003) estimated a fire return interval of 11 to 15 years on Monument lands at Point Colville and Iceberg Point. In contrast, current mean fire return intervals exceed 100 years (Peterson and Hammer 2001, Dunwiddie et al. 2011). Based on the structure of old Douglas-fir and basal charcoal on the boles of many trees, most fires prior to Euro-American settlement were low to moderate intensity, serving to keep woodlands and savannas open and limiting tree and shrub encroachment (Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011).

Land use changes beginning during the Euro-American settlement period have caused changes to the San Juan Islands landscape, including forests becoming denser, conifers encroaching into grasslands and oak savannas, and shrubs starting to dominate understories (Peterson and Hammer 2001, Avery 2004, McCune et al. 2013, Pellatt and Gedalof 2014). For example, Dunwiddie et al. (2011) estimated the

historical tree density on Waldron Island was about 1/10 of the current density. The rate of encroachment, infill, and shrub expansion varied from island to island (Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011). Early in the Euro-American settlement period, several invasive plant species, including annual grasses, established on the larger islands, likely as a result of introducing sheep, cattle, hogs, and horses to these islands (Avery 2004, McCune et al. 2013). In many parts of the San Juan Islands, the dominant fuelbed has shifted from a vertically separated, open-canopy woodland or savanna with a grass understory to relatively dense, multi-layered forest with abundant ladder fuels and an understory dominated by shrubs and downed wood (Agee and Dunwiddie 1984, Gray and Daniels 2006, Dunwiddie et al. 2011, Sprenger and Dunwiddie 2011). In areas that remain open with grassy understories, invasive grasses have often displaced native grasses (Avery 2004).

Current longer fire return intervals facilitated these changes in fuelbed and vegetation composition and structure (Agee and Dunwiddie 1984, Peterson and Hammer 2001, MacDougall et al. 2004, Dunwiddie et al. 2011, McCune et al. 2013, Pellatt and Gedalof 2014), which affect potential fire behavior. When fires occur, low to moderate fire intensity remains likely on the drier, more open windward side of the San Juan Islands. However, where a conifer-shrub community has replaced woodland, savanna, and grasslands and where multiple forest layers have developed, moderate and high intensity fire is more likely when fires occur.

Since the Monument does not have an RMP or fire management plan, the default response to all wildfires, regardless of origin, is suppression, consistent with Federal wildland fire policy (U.S. Department of the Interior et al. 2001). This response applies to all fires that ignite within the Monument and that threaten to burn into the Monument. Once the BLM completes an RMP for the Monument, the subsequent fire management plan must describe allowable wildfire responses that support the management goals and objectives of the RMP. In all wildfire responses, the protection of human life is the single overriding priority. After human life, response priorities are based on the values to be protected, such as, communities, infrastructure, property and improvements, and natural and cultural resources (BLM 2005).

Historical fire regimes describe the role fire would play in a landscape in the absence of modern human intervention, but take into account Native American/Indigenous Peoples traditional practices. Fire regimes are classified based on the average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on dominant overstory species. For example, areas with frequent, relatively low intensity fires are classified as fire regime I, while areas with infrequent, high intensity fires are classified as fire regime V (Table 60).

According to San Juan County's community wildfire protection plan (San Juan County 2012) most of the San Juan Islands consists of fire regimes III and V, although a substantial area was rated as having indeterminate fire regime characteristics (Table 60). However, the descriptions of the historical vegetation structure, communities, past estimated fire return intervals, and probable fire behavior suggest that the islands may have historically supported a considerable area in fire regimes I and II and less area in fire regimes III and V (Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011). The most recent LANDFIRE regime classification for the San Juan Islands also indicates a predominance of fire regimes III and V (LANDFIRE 2015). The difference between the descriptions of the historical vegetation and the current vegetation indicates that the county classification and the LANDFIRE classification are more representative of current fire regimes than of historical fire regimes.

Table 60: Natural fire regime in the San Juan Islands

Fire Regime	Frequency (years)	Severity	Number of Acres	Percent of Total
I	0−35	Low and Mixed	0	0
II	0−35	Replacement	0	0
III	35−200	Mixed and Low	46,355	41%
IV	35−200	Replacement	13,440	12%

Fire Regime	Frequency (years)	Severity	Number of Acres	Percent of Total
V	200+	Replacement and Mixed	30,242	27%
Water	N/A	Water	1,008	<1%
Barren	N/A	Barren	515	<1%
Indeterminate	N/A	Indeterminate fire regime characteristics*	20,873	19%
		Total	**112,433**	**100%**

* Urban areas, agricultural areas, and other developed areas

Source: San Juan County, Washington Community Wildfire Protection Plan/Wildfire Risk Assessment (San Juan County 2012)

The community wildfire protection plan rated 75 percent of San Juan Islands as moderately departed from historical conditions, 10 percent with low departure, and less than one percent with high departure (San Juan County 2012). The current vegetation descriptions suggest that more than one percent of the area could be classified as highly departed from historical conditions with uncharacteristic vegetation structure and species compositions now widespread (Agee and Dunwiddie 1984, Avery 2004, Gray and Daniels 2006, Dunwiddie et al. 2011).

Because the BLM has no fire organization present on the San Juan Islands, WDNR has provided fire protection within Monument boundaries. The standardized methods used to archive wildfire occurrence, size, and lands affected make it difficult to determine how many, if any, wildfires have burned on Monument lands since 1970. Based on data collected by the BLM and WDNR over 40+ years, 88 percent of wildfires on State and Federal lands in the San Juan Islands are human caused, 10 percent have an unknown cause, and 2 percent are lightning-caused (San Juan County 2012) (Table 61). Between 1970 and 2011, San Juan County averaged 13 fires per year, although the number of ignitions declined between 1970 and 1990 and have since fluctuated around an average of six ignitions. Only 30 acres burn, on average, each year, although in 2003, 468 acres burned, primarily on National Park Service lands (San Juan County 2012). Drought conditions appear to play a substantial role in the number of acres burned in any given year, particularly when coupled with high wind events (San Juan County 2012)

Table 61: Fire ignitions and acres burned within San Juan County by source, 1970−2011

Cause	# of Ignitions	Percent	Acres Burned	Percent
Lightning	11	2%	27	5%
Human	435	88%	421	74%
Unknown	47	10%	122	21%
Total	**493**	**100%**	**570**	**100%**

Source: San Juan County, Washington Community Wildfire Protection Plan/Wildfire Risk Assessment (San Juan County 2012)

Land management agencies refer to wildlands in close proximity to homes and structures as wildland urban interface; these areas are a higher priority for both fire suppression and fuels management. A recent mapping effort classified most of the privately-owned portions of San Juan County as wildland-urban intermix (≥6.18 houses per km^2 and ≥50 percent cover of wildland vegetation) with the southern portion of San Juan Island and the areas of Lopez and Orcas Island with denser housing as wildland urban interface (≥6.18 houses per km^2 and ≤50 percent cover of wildland vegetation) (Martinuzzi et al. 2015).

The BLM often uses various vegetative management tools, such as thinning and prescribed fire, to bring a landscape into closer conformance with its historical fire regime, as well as to reduce wildfire threats to homes and property from increased fuel loading. Currently, the BLM is not conducting fuels treatments of any sort in the Monument. Within the San Juan Islands, the National Park Service and The Nature Conservancy use thinning and prescribed burning to restore various plant communities. Other landowners use prescribed burning to dispose of fuels created by land management activities.

Grassland fuelbeds provide the highest surface fire (i.e., fire that spreads through ground level fuels) potential under severe burning conditions (Table 62). The drier forests, such as those dominated by Douglas-fir and grand fir, have the highest spread potential and crown fire (i.e., fire that spreads through the top layer of foliage and is typically the most intense type of fire) potential. Crowning occurs readily in those trees growing in the grassland, but since such trees are generally widely scattered, there is no crown fire spread potential. However, torching (i.e., crowning in a single tree or small group of trees) could loft embers into surrounding fuel types, allowing spot fires to start under dry conditions. While the crowning potential in all forest types on the San Juan Islands is only moderate at most, they all have a high potential to support the spread of a crown fire. All forest types also have high fuel loading, but fine fuel loading is light (Table 62). The light loading indicates that starting a fire in these fuelbeds is difficult, but the heavy loading in coarse wood and duff indicate that once a fire is established, suppression could be difficult, especially in the riparian forests.

The rates of spread and surface fire flame lengths in Table 62 are what would occur under relatively severe burning conditions in summer. Under the milder conditions that are more typical of the San Juan Islands, rates of spread would be slower and flame lengths lower. Other factors affecting potential fire behavior are slope steepness and midflame windspeed. On gentler slopes or under lower windspeeds, expected rates of spread and flame lengths would be lower, whereas they would be higher on steeper slopes or under higher windspeeds.

Table 62: Outputs of key potential fire behavior from FCCS

Fuelbed Name	FCCS ID	FCCS Code	Crown Fire Initiation Potential	Crown Fire Spread Potential	Surface Fire Rate of Spread	Surface Fire Flame Length
Dry Forest and Woodland	208u2	659	4	9	41 chains/hour	9 ft
Moist Forest	2u3	339	3	8	16 chains/hour	5 ft
Riparian Forest	2u4	439	3	9	15 chains/hour	6 ft
Grassland	41u2	940	8	0	99 chains/hour	12 ft
Willow Shrubland	331u1	402	0	0	14 chains/hour	4 ft

Note: the marsh fuelbed resulted in no estimates of fire behavior potential. The FCCS code, Crown Fire Initiation Potential code, and Crown Fire Spread Potential code vary from 0 to 9 (Prichard et al. 2013). The surface fire rates of spread and flame lengths are based on very dry woody fuels, cured grasses, 15 percent slope, and 10 mph midflame wind speed. 1 chain = 66 feet

The FCCS code consists of three potentials: surface fire potential, crown fire potential, and available fuel potential. Higher numbers indicate greater risk. The surface fire potential (first number in the code) is comprised of codes concerning reaction intensity, rate of spread potential, and flame length potential. The crown fire potential (second number) consists of codes for crown fire initiation potential and crown-to-crown spread potential, or transmissivity, and crown fire spreading potential. Crown fire spread cannot occur until the fire can initially spread into tree crowns and then spread from crown-to-crown. Thus, the BLM has focused on those two elements of the crown fire potential.

The surface fire behavior affects how readily firefighters can successfully suppress a fire, although other factors can affect success rates beyond what the fire behavior estimates indicate. In addition, actual fire behavior can vary from predicted fire behavior by a factor of two, ranging from half as much to twice as much. As rules of thumb, predicted flame lengths of 4 feet represent the upper limits of direct attack of a fire using just hand tools and predicted flame lengths of 8 feet indicate a high probability of tree crowning. However, the spacing between trees also affects whether a fire can move from crown-to-crown and burning conditions, particularly windspeed and live foliar moisture, affect whether an active crown fire can develop.

Current Risks to Monument Objects and Values

Ecological Objects and Values

The Monument's ecological objects and values include its diverse plant communities and the native plants and wildlife species that occur within them. Some of these communities are fire dependent and threatened by the lack of wildfire and the possibility of uncharacteristically severe wildfire. Others are fire sensitive and threatened by degradation or loss of habitat or direct mortality from high intensity wildfire. For still others, little is known about potential responses to wildfire of differing intensities or severity, resulting in unknown risks.

The ecological values at risk from lack of wildfire or potentially uncharacteristically severe fire include species that typically grow in warmer, drier habitats or somewhat moister habitats previously maintained by fire. These include species that occupy woodlands, savannas, or grasslands, including many culturally important plants. As discussed above, Native Americans/Indigenous Peoples created and maintained habitat for these species through land management practices, including the frequent use of fire. These fire-maintained settings also created habitat for certain wildlife species such as western bluebirds, deer, and other species that depend on open areas or open woodlands. Conifer encroachment and stand densification has occurred on most Monument lands, reducing the extent of grasslands and nearly eliminating savannas and woodlands except in areas with a high proportion of surface rock.

Surface fuel build-up, primarily in the form of dead thatch in grasslands, increased woody fuels, and duff, increase the probability of uncharacteristically severe fire with respect to soil heating and seed banks as well as many culturally important forbs. Much of this severity would arise from long-term smoldering that creates lethal soil temperatures in the upper 1-2 inches of soil, killing seeds and killing or severely damaging meristems.

Conifer encroachment and stand densification have increased canopy fuels, with a resulting increase in the risk of stand-replacing wildfire or larger stand-replacing patches than may have occurred historically. This change places both fire dependent and fire sensitive species at greater risk. For example, the apparent increased presence of fire sensitive conifers such as grand fir and western hemlock at the expense of fire-adapted species such as Douglas-fir and Garry oak, results in more continuous canopy cover in the uplands and much higher risk of active crown fire development. Old tree-dependent species are more likely to lose substantial amounts of habitat with the loss of more complex forest structure. Prior to fire exclusion, habitat for such fire sensitive species was likely restricted to northerly aspects and wetter areas that were somewhat protected from stand-replacing fire by the surrounding more open forests and woodlands that limited the potential for crown fire development.

Little is known about the relationship of most forbs and some wildlife species to fire. For example, the island marble butterfly occupies grasslands in close proximity to the Monument and is dependent on a native mustard during the larval stage. While many members of the mustard family increase following fire, not all mustard species do and nothing is known about the fire ecology of the native mustard, tall pepperweed (*Lepidium virginicum* var. *menziesii*), that the island marble butterfly formerly depended upon. The butterfly also uses two non-native mustards (field mustard, or *Brassica rapa*, and tumble mustard, or *Sisymbrium altissimum*) (Lambert 2011) that can increase following disturbances that create bare soil. Tumble mustard also appears to persist in the seedbank for many decades (Howard 2003).

Cultural Objects and Values

The Monument's cultural objects and values include both historic structures and archaeological sites (see the Cultural Resources section for detailed descriptions). The historic structures include Patos Island Lighthouse and Turn Point Light Station and its associated buildings. Archaeological values consist of buried artifacts dating from both before and after Euro-American settlement. These values include middens, burial sites, former village sites, and artifacts associated with the lighthouses.

Patos Island Light is a wooden structure located at the northwestern tip of Patos Island in an open area dominated by surface rock, short grass, and patches of low shrubs. Dense forest lies approximately 0.1

miles to the southeast. The lighthouse appears to be moderately well protected from wildfire by its setting. While embers from a crown fire might ignite the structure, it would require a rare southeasterly wind during an unusually hot and dry summer.

Turn Point Light Station is a concrete structure located on the western tip of Stuart Island. The site includes numerous other wooden structures within a woodland setting that has a grass understory. Solar panels and a propane generator provide power to the site; these are in a more forested setting up the hill from the structures. Google Earth imagery of the site suggests that canopy cover of conifers has increased since 1998, likely due to continued tree growth. Canopy cover appears to be more continuous around the associated structures (e.g., the keeper's quarters) than around the main lighthouse and fog building, although much of the area around the keeper's quarters also has no trees overhanging the structure. All structures, with the exception of the concrete light, are vulnerable to spotting (i.e., the spread of fire by wind-carried embers) and crown fire under east wind conditions. Surface fires that start after grasses have cured in the fall may be able to ignite any structures that do not have a concrete, concrete block, or brick foundation or if the flame heights are greater than the height of a non-burnable foundation. However, locally-made brick, concrete block, and masonry surfaces are subject to spalling, cracking, breaking, chipping, and crater formation on the surface and lime-based mortar can calcinate and crumble if the fire is of high enough intensity (Ryan et al. 2012).

Archaeological resources within the Monument have not been fully inventoried (see Cultural Resources section for more detail). Therefore, this section discusses the vulnerability of such resources to fire and fire suppression actions only by general category. The vulnerability of archaeological resources depends on the nature of the resource, its location (above or below the soil), and fire intensity or severity (Ryan et al. 2012). Artifacts buried in soil are generally protected from fire, with essentially no impact from even the highest severity fires if buried at least six inches deep in the soil unless they are located adjacent to a tree root or stump that burns out (Ryan et al. 2012). Artifacts containing or consisting of wood or other plant materials, leather, bone, rubber, or plastics can be completely consumed and lost if on the surface, and can be charred or otherwise damaged in higher severity fires that result in high surface soil temperatures when located in the upper 1 to 2 inches of soil. Stone artifacts on or just under the soil surface made of quartz, quartzite, mudstone, siltstone, sandstone, or slate can suffer from micro- or macrocracks, spalling, exfoliation, and discoloration in areas of high fuel loading (e.g., large logs, dense brush) that burned completely or nearly completely (Ryan et al. 2012). Shell middens are likely better protected from fire, in part due to the material and in part due to their typical shoreline location.

In addition to damage from fires, archaeological resources can be at risk from fire suppression actions (Ryan et al. 2012). Artifacts located close to the surface can be unearthed during fireline construction or mop-up activities. Middens could be damaged or disrupted by heavy equipment or by aerial drops of retardant or water.

Current Risks to Adjoining Properties

The San Juan County community wildfire protection plan (CWPP) rated all lands with a relative threat level based on slope, aspect, gorse occurrence, precipitation, fuel models, expected rates of spread, expected fire intensity, population density, and critical infrastructure (San Juan County 2012). In addition, the CWPP indicates which communities are actively engaged in creating Firewise communities and structures (Table 63) (i.e., taking proactive steps to reduce their vulnerability to wildfire).

In assessing how many structures could be at risk from a wildfire starting on Monument lands, the BLM used a combination of Google Earth and San Juan County tax records (available at https://sjcgis.org/PolarisJS/) to estimate the numbers and locations (with respect to Monument boundaries) of potentially affected structures. The BLM counted the number of visible structures or tax record structures within ¼ mile of Monument boundaries as most spotting typically occurs within ¼ mile of torching or crowning trees. The counts do not necessarily capture all outbuildings, however.

Lopez Island

There were no Firewise communities on Lopez Island as of 2012. Individual landowners may be taking proactive actions to reduce fire risks without being part of a Firewise community. About eight structures are located within ¼ mile of the Point Colville-Watmough Bay parcels, with half located to the west of Point Colville and half to the east. Additional structures are located to the west beyond ¼ mile. Most are located within the trees with poor access for structure protection equipment. The level of recreation use at Watmough Bay creates a somewhat increased risk of ignitions. Steep slopes to the south of Watmough Marsh would promote torching and crowning, allowing for rapid spread uphill should a fire start in proximity to Watmough Marsh. Several structures are also located in proximity to Chadwick Hill, although many of the structures are likely better protected by the combination of plowed fields between the structures and the Monument, the general lack of ignitions, and the lower rate of recreation use. The structures that would be most vulnerable are those located within or on the edge of denser forest.

Approximately 15 structures are located in proximity to Iceberg Point with about half located in the trees and half located adjacent to open areas or plowed fields. A fire starting within the grassland during high to severe burning conditions (hot, dry, and windy) would likely result in a crown fire once the fire reached the trees. The access into Iceberg Point would likely mean a frontal attack on the fire, with concurrent very high risks of entrapment and burn-over of the firefighters. These conditions place the structures located in the trees at much higher risk than those located adjacent to open areas and plowed/mown fields.

San Juan Island

Cattle Point is the only Monument location of appreciable size on San Juan Island. Cattle Point is predominantly grassland and very high rates of spread are possible from a fire originating in this area. At least two structures are located in adjacent dense trees, with a state-owned structure beyond in another grassland, and approximately 26 structures across the road in a subdivision. The Cattle Point community is an active Firewise community, reducing the potential risk, although is not clear if the two or more structures in the forested parcel to the east of Cattle Point are included in the Firewise community.

Henry Island

Kellett Bluff is located on the southern tip of Henry Island with dense forest to the north. No structures are located within ¼ mile of the parcel, but at least eight vacation cabins are located just beyond that distance on Open Bay. Rapid fire spread by torching and spotting is likely under severe burning conditions with no apparent road access to the structures. There are no Firewise communities on Henry Island as of 2012. There are no fire stations on Henry Island, so response is via boat by San Juan Fire District #3 under contract with WDNR.

Stuart Island

Turn Point is located on the northwest tip of Stuart Island. At least two structures are located within ¼ mile of Monument land to the south-southeast and several additional structures are located about ½ mile to the east. The two closer structures are located within denser forest while the structures further away are located near or adjacent to openings and in more open forest. There are no fire stations on Stuart Island, so response is via boat by San Juan Fire District #3 under contract with WDNR.

Table 63: Potential fire risks posed to structures on adjoining lands from a wildfire originating on Monument lands

Monument Parcel	Structures within ¼ mile	CWPP Wildfire Threat Rating	Firewise Community	Primary Fire Behavior Concern	Primary Fire Weather Concern*
Turn Point	2	Low to Moderate	No	Crown fire, torching spotting	Strong west or northwest winds
Kellett Bluff	0	Low	No	Torching and spotting	Strong south or southwest winds

Monument Parcel	Structures within ¼ mile	CWPP Wildfire Threat Rating	Firewise Community	Primary Fire Behavior Concern	Primary Fire Weather Concern*
Cattle Point	~30	Moderate	Yes	Rapid spread	Strong south or southwest winds
Iceberg Point	~15	Moderate to High	No	Rapid spread, crown fire, torching, spotting	Strong south, southwest, or west winds
Point Colville-Watmough Bay	8	Low to High	No	Crown fire, torching, spotting, rapid spread uphill from Watmough Marsh	Strong west or southwest winds, 3 structures vulnerable to east winds
Chadwick Hill	24	Low to Moderate	No	Crown fire, torching, spotting	Strong south or southwest winds

* Assumes hot, dry, and windy conditions, focus is on wind direction

Note: The focus of this table is on the parcels large enough for a free-burning wildfire to develop.

Effects of the Alternatives

No Action Alternative and Alternatives A and D

Under the No Action Alternative, the BLM would continue to take a custodial approach to management and vegetative communities in the Monument would further depart from historical conditions. Douglas-fir and other conifers would continue to expand into the remaining oak woodlands and grasslands, further reducing the remaining camas gardens. These changes in the plant communities and associated fuel beds would increase the likelihood that when wildfires do occur, both fire behavior and fire effects would be more likely to produce undesired effects, such as high levels of smoke, increased erosion risks, and loss of vegetation features discussed in Proclamation 8947. In addition, such fires could pose an increased threat to structures downwind of Monument lands on the lower southeast section of Lopez Island. Fires on other Monument lands would be unlikely to pose risk to privately owned structures. However, given the size and location of most parcels in the Monument, the BLM has very limited opportunity to influence fire risks to private lands.

The expected effects of alternatives A and D would be similar to the No Action Alternative. Under Alternative A, the BLM would continue a passive management approach and would likely conduct vegetation treatments only to control invasive plants and remove hazard trees (see Table 17 on page 111). The treated areas would maintain the same expected fire behavior and risks as under current conditions, although the untreated areas would experience changes in fire risk similar to the No Action Alternative. Alternative D seeks to maintain current conditions, and therefore would maintain current risks and expected fire behavior.

Alternatives B, C and Sub-C

This section describes how treatment of moist forest, dry forest, and grasslands would alter potential crown fire risks and fire behavior under alternatives B, C, and sub-C using typical summer wildfire conditions for the western United States. Although alternatives B, C and sub-C have different objectives and management direction, their impacts on fuelbed composition and structure, and the resulting potential fire behavior and fire risks, are very similar (Table 64). The remaining three vegetation types (riparian forest, marsh, and willow shrubland) comprise only a minor portion of the Monument and would either be an unlikely target for treatment or treatments would not be expected to alter wildfire risks (e.g., treatments in wetlands would not alter wildfire risks).

Table 64: Changes in potential key fire behavior for alternatives B, C and sub-C post-treatment

Fuelbed Name	FCCS Code	Crown Fire Initiation Potential	Crown Fire Spread Potential	Surface Fire Rate of Spread	Surface Fire Flame Length
Dry Forest and Woodland	522	Decreased 50 percent	Eliminated	Decreased ~30 percent	Decreased ~30 percent
Moist Forest	624	Unchanged	Eliminated	Increased ~168 percent	Doubled
Grassland	900	Unchanged	Unchanged	Increased ~30 percent	Unchanged

Sources: Fuel Characteristic Class System and Consume 3.0

Dry Forests and Woodlands

Following treatment, forest canopies would be more open, ladder fuels largely eliminated, dead, downed woody fuels decreased, and grass fuels increased. Torching (ignition of the crown of one tree or a small group of trees) would still be likely but active crown fire (fire spreading through the crowns of trees) would not. Where treatment increased the proportion of deciduous trees, such as oak, the probability of torching would decline further as deciduous trees usually cannot support crowning fire. Reductions in duff and dead, downed woody fuel would greatly reduce smoldering combustion and resulting heat pulses into the soil and create more rapid burn out times (time for all available fuel to finish burning). The expected flame length would still exceed that considered safe for direct attack at the head of the fire but the reduced risk of crown fire and conversion to a dominance of grass fuels would increase the effectiveness of suppression tactics, including the use of water, firefighting foam, and retardant. Conversion of the surface fuels to predominantly grasses with their rapid burnout times would also permit the use of additional tactics, such as inside-out attack, where terrain is favorable. Inside-out attack consists of driving an engine into the burned area and applying water, foam, or retardant to the rear of the flames.

Moist Forests

Following treatment, forest canopies would be more open, ladder fuels greatly reduced but not eliminated, dead-downed woody fuels and shrub fuels reduced, and grass fuels increased. The BLM expects that moist forests would remain conifer dominated. Treatment would result in little to no change in torching potential, but active crown fire potential would be greatly reduced or nearly eliminated. Less duff and reduced dead, downed woody fuels would reduce burnout times, although likely not to the degree as in dry forests and woodlands. Expected flame lengths would nearly double and would exceed that considered safe for direct attack at the head of the fire, although the reason for that change is not clear given the expected changes in the fuelbed. Clumps of shrubs are more likely to produce the predicted flame lengths than grassy areas. Taller shrubs and grasses in moist forest as compared to the dry forest could also be a factor in the predicted increased flame lengths. More open canopy and lighter surface fuels should increase suppression effectiveness, however, such as use of burning out and application of firefighting foam or retardant. The increase in the extent of grass fuels may allow for a wider array of tactics, such as inside out attack where terrain and fuel arrangement permit.

Grasslands

Following treatment, woody fuels such as trees and shrubs would be reduced or eliminated, thereby eliminating torching and active crown fire. Since this type would remain grass dominated, flame lengths and burnout times would remain unchanged. Surface fire rate-of-spread would likely increase as fire usually spreads faster in grass fuels than in shrub or downed woody fuels. Reducing or eliminating these elements in the grassland would also reduce or eliminate pockets where fire spread would be lower.

Risks to Monument Objects and Values

The predicted changes in fire behavior would likely reduce risks to Monument ecological values and some cultural objects and values. The BLM expects that changes in the available fuel potential would cause a decrease in the extent of smoldering combustion and duration of residual burning, reducing heat pulses into the soil and limiting heat exposure aboveground. Reducing the heat pulse into the soil would help protect seedbanks and cultural artifacts buried in the top six inches of soil (Ryan et al. 2012, Chapter 2). The expected changes in fire behavior would also better protect the large trees that create old growth character in forests and woodlands (Stephens et al. 2009, Johnson et al. 2011, Safford et al. 2012)

The BLM estimates that it would undertake prescribed burning to achieve habitat and plant communities objectives under alternatives B and C. This would likely favor fire-adapted culturally important plant species, such as camas. Ethnographic accounts indicate that many coastal prairies and grasslands were burned annually or semi-annually (Boyd 1999, Beckwith 2004). Late summer and fall burning, both before the onset of fall rains and after berry harvesting, appears to have been the more common practice in the Puget Sound area (Boyd 1999, Beckwith 2004), such that plant response may depend more on season of burn than frequency of burn.

However, confounding potential favorable responses of culturally important plant species are the potential responses of invasive plant species. Many invasive plants are also disturbance adapted and thus favored by fire (Zouhar et al. 2008). Since alternative sub-C would not allow the use of herbicides to control invasive plants, the combination of ineffective control and the likelihood of prescribed fire would be more likely to favor invasive plants, especially invasive grasses, over culturally important plants (see also discussion under Habitat and Plants Issue 2). This risk would be lower under alternatives B and C, where use of herbicides in combination with other treatment methods would be more likely to successfully control invasive plant species.

All three alternatives would reduce the risk of ignition from crown fire and ember showers from short-range spotting for most historic structures by roughly equal amounts. Historic structures would remain vulnerable to ember showers from longer range spotting if forests on adjoining lands remain untreated. However, increased flame lengths could increase threats to some historic structures, exposing some to direct flames that exceed the predicted flame lengths under current conditions. Whether this particular threat would occur depends on whether grasses actually increase, particularly in moist forest, and the types of grasses that come in. As the FCCS outputs indicate, flame length is, in part, a function of fuelbed height. Tall grasses, such as the non-native tall fescue, Kentucky bluegrass, or orchardgrass are also more likely to produce the higher flame lengths than the typically shorter native bunchgrasses. In addition, because grass production varies from year-to-year, the threat would be higher following a year with a wetter spring or summer than following a year with a drier spring or summer and may be highest in a year with a wetter winter and spring followed by a flash drought.

The BLM cannot predict with any acceptable level of accuracy whether grasses would increase in moist forests and what species of grasses would be likely to appear, particularly where post-treatment seeding did not occur. Whether post-treatment seeding would occur and what species the BLM would plant depends on specific implementation-level project design and is outside the scope of this analysis. Species of grasses nearby can provide seed sources. Rhizomatous species can spread into the treated area via underground stems. In dry forests, one intent of treatment would be to approximate historical conditions (alternatives C and sub-C) or to create conditions more resistant to insects, disease, drought, and fire (Alternative B), which would include an increase in grasses.

Risks to Adjoining Properties

Thinning in both dry and moist forest would reduce risks to adjoining properties from fires originating on or crossing Monument parcels that are largely forested. The greater risk to adjoining properties would be from ember showers originating in crown fires (Manzello and Foote 2014 and references therein). Success rates at stopping fire spread in tree crowns are very low since the only suppression technique is to

moisten tree crowns with water or reduce flammability through application of retardant or firefighting foams (Alexander and Cruz 2011). However, it is nearly impossible to treat entire tree crowns adequately with water, retardant, or foam. Therefore, the preferred technique is to reduce ladder fuels to greatly reduce crown fire initiation and thin stands enough that spread from crown-to-crown (transmissivity) is very low (Alexander and Cruz 2011, Johnson et al. 2011, Contreras et al. 2012). These techniques typically cause the fire to "drop" to the surface where firefighters can safely apply a greater number of suppression techniques with higher rates of success in stopping wildfires (Moghaddas and Craggs 2007, Stephens et al. 2009). The FCCS output indicates that crown fire initiation within treated Monument parcels would reduce crown fire initiation in dry forest and leave it unchanged in moist forest. In both forest types, crown fire initiation probability would be low to moderately low and consist more of torching trees. In both forest types, thinning would reduce the probability of crown fire transmissivity to zero, indicating that crown fires entering treated Monument parcels would drop to the surface.

Although treated Monument parcels would be unlikely to be large enough to completely halt fire spread, they could reduce potential fire severity for a short distance downwind of the parcel under more severe burning conditions (Martinson et al. 2003, Moghaddas and Craggs 2007, Kennedy and Johnson 2014). This effect would be most likely if a stand-replacing wildfire were to burn into a treated Monument parcel when the fire was still small (Martinson et al. 2003).

Rapid fire spread would remain a concern due to the increase in grass fuels that would occur under these alternatives. However, as discussed above, firefighters likely would also have more options in suppression tactics. Similarly, the area's steep slopes indicate that the risk of rapid spread uphill out of the Watmough Marsh area would remain unchanged.

Table 65: Changes in expected fire risks to adjoining structures under alternatives B, C and sub-C from fires originating within or burning through treated Monument parcels

Monument Parcel	Structures within ¼ mile	Primary Fire Behavior Changes
Turn Point	2	Reduced torching and spotting, no crown fire
Kellett Bluff	0	Reduced torching and spotting
Cattle Point	~30	No change from current condition
Iceberg Point	~15	Continued rapid spread, reduced torching and spotting, no crown fire
Point Colville-Watmough Bay	8	Reduced torching and spotting, reduced crown fire risk, continued rapid spread uphill from Watmough Marsh
Chadwick Hill	24	Reduced torching and spotting, no crown fire

Conclusions

The No Action Alternative and alternatives A and D would likely lead to higher fire risks, lower protection or maintenance of fire-dependent Monument objects and values, and increased risks to adjoining properties. Alternatives B and C would reduce fire risks, maintain or enhance fire-dependent Monument objects and values, and reduce risks to adjoining properties. Alternative sub-C would produce some reduction in fire risks, partially maintain or enhance fire-dependent Monument objects and values, and moderately reduce risks to adjoining properties, but the probable increase in invasive species would reduce the effectiveness of this alternative relative to alternatives B and C.

Cumulative Effects on Fire Behavior in the San Juan Islands

Most of the Monument parcels are too small to have a substantial effect on fire regimes, condition class, wildfire behavior, and risks of adverse impacts from wildfires on any particular island, with the possible exception of Patos Island. Since the BLM manages all of Patos Island, the agency could alter vegetation and fuel condition class, potential fire behavior, and potential fire effects under alternatives B, C, and sub-C, but likely would not have the same effect under the No Action Alternative or alternatives A and D.

The location of most Monument lands on points and other edges of islands limits the ability of any single parcel or all the parcels collectively to substantially affect overall wildfire risks, regardless of which alternative the BLM selects. However, where parcels are located upwind of active Firewise communities, changes to potential fire behavior and fire risks on the parcel would likely enhance the effectiveness of hazardous fuel reduction treatments on those properties under alternatives B, C, and sub-C.

Wildlife and Fish

Key Points

- Departure from historic disturbance patterns is changing the extent and condition of habitats within the Monument.
- There are trade-offs between the alternatives for wildlife associated with different Monument habitats. The No Action Alternative and Alternative A would be beneficial for wildlife that make use of forests with closed canopies. Alternatives B and C would be beneficial for wildlife that make use of grasslands and shrublands, more open woodlands, and wetlands.
- Alternative D would have the most trails within 300 feet of formally identified marine mammal haulouts and within 300 feet of the shoreline in general. This alternative would have the greatest potential for disturbance to nearshore wildlife, including marine mammals and seabirds.
- Alternatives that would enhance the extent and condition of Monument grasslands and shrublands would expand potential habitat for the island marble butterfly, though only Alternative B is likely to expand potential larval habitat.
- The No Action Alternative and Alterative D would allow the greatest amount of recreational use of the Monument and have the greatest potential for disturbance to wildlife.

This section contains three analytical issues:

1. How would changes in the quality and quantity of habitat and plant communities affect wildlife species and fishes (including sensitive species) under each alternative? (page 249)
2. How would variations in human use/disturbance under each alternative affect wildlife species and fishes (including special status species)? (page 265)
3. How would the alternatives address the primary threats to island marble butterflies identified in the U.S. FWS' 12 month finding for the species? (page 280)
4. How would variations in the control of wildlife of management concern (i.e., potentially harmful wildlife) and opportunities for hunting using firearms impact wildlife habitat? (page 284)

Background

As stated in Proclamation 8947, "the diversity of habitats in the San Juan Islands is critical to supporting an equally varied collection of wildlife." Thus, the BLM's role in maintaining and/or improving habitat for wildlife is a focus of this section. However, because the BLM manages only a fraction of the habitat in the San Juan Islands, and does not have direct jurisdiction over the wildlife species occurring in the Monument, this document emphasizes those species most likely to occur within the Monument's boundaries and those that have a special status under law or policy.

Federally Listed Species

Thirteen federally listed species occur in the San Juan Islands. The majority of the listed species in the islands, including orcas and listed fish species, occur in the waters surrounding the islands and are not present in habitats directly managed by the BLM. It is possible that in the future the U.S. FWS or NOAA Fisheries could identify recovery actions for listed species pertaining to Monument lands. As described in Wildlife Issue 3, in April of 2018 the U.S. FWS published a proposed rule to list the island marble butterfly, which is currently a candidate species, as an endangered species and designate critical habitat under the Endangered Species Act of 1973 (ESA) (U.S. FWS 2018). Critical habitat would include the

Monument land at Cattle Point (approximately 23 acres). Table 66 provides the federally listed species in the San Juan Islands and their current regulatory status.

Table 66: Listed threatened and endangered species in the San Juan Islands*

Group	Species	Status	Presence	Habitat Association
Birds	Marbled murrelet (*Brachyramphus marmoratus)*	FT	D	Marine/nearshore
Marine Mammal	Orca (*Orcinus orca*), Southern Resident Distinct Population Segment (DPS)	FE	D	Marine
Insect	Taylor's checkerspot butterfly (*Euphydryas editha taylori*)	FE	X	Grasslands and shrublands
Fish	Bocaccio (*Sebastes paucispinis*)	FE	D	Nearshore (juv), deep water rocky (adult)
Fish	Green sturgeon (*Acipenser medirostris*), Southern DPS	FT	D	Nearshore marine, estuary, migratory marine
Fish	Eulachon (*Thaleichthys pacificus*), Southern DPS	FT	D	Marine areas deeper than 20 m, estuarine
Fish	Bull trout (*Salvelinus confluentus*), Puget Sound/Coastal DPS	FT	D	Nearshore marine areas, migratory marine
Fish	Chinook (*Oncorhynchus tshawytscha*), Puget Sound Evolutionarily Significant Unit (ESU)	FT	D	Nearshore marine areas, migratory marine
Fish	Chum (*Oncorhynchus keta*), Hood canal/Summer run ESU	FT	D	Nearshore marine areas, migratory marine
Fish	Steelhead (*Oncorhynchus mykiss*), Puget Sound DPS	FT	D	Nearshore marine areas, migratory marine
Fish	Yelloweye rockfish (*S. ruberrimus*)	FT	D	Nearshore (juv), deep water rocky (adult)

D-Documented, FE-Federally Endangered, FT-Federally Threatened, X-Extirpated or historically present
*These species are documented or suspected in the San Juan Islands as a whole, not necessarily on within the Monument.

Bureau Sensitive Species

In addition to the federally listed species described above, 10 Bureau sensitive species occur or are suspected to occur within the Monument. As described above, the BLM emphasizes managing habitats to promote conservation and avoid the need for listing pursuant to the ESA (BLM 2008c).

Table 67: BLM sensitive species in the San Juan Islands*

Group	Species	Federal Status	State Status	Presence	Habitat Association
Birds	Bald eagle (*Haliaeetus leucocephalus*)	BS		D	Forest & woodlands/nearshore
	Common loon (*Gavia immer*)	BS	S	D	Wetlands/nearshore
	Gyrfalcon (*Falco rusticolus*)	BS	M	D	Grasslands & shrublands/wetlands
	Harlequin duck (*Histrionicus histrionicus*)	BS		D	Nearshore
	Lewis's woodpecker (*Melanerpes lewis*)	BS			Forest

Group	Species	Federal Status	State Status	Presence	Habitat Association
	Peregrine falcon (*Falco peregrines)*	BS		D	Grasslands & shrublands/nearshore
	Sandhill crane (*Grus Canadensis*)	BS			Grassland and riparian (winter visitor)
	Short-eared owl (*Aegolius acadicus*)	BS		Suspected	Grasslands & shrublands
Terrestrial Mammals	Little brown myotis (bat) (*Myotis lucifugus)*	BS		D	Forest & woodland/ wetlands
	Shaw Island Townsend's vole (*Microtus townsendii pugeti*)	BS	M	D	Forest & woodland/ grasslands & shrublands
	Townsend's big-eared bat (*Corynorhinus townsendii*)	BS	C	D	Forest &woodlands/ grasslands & shrublands/ wetlands
Invertebrate	Island marble butterfly (*Euchloe ausonides insulanus*)	PE, BS	C	D	Grasslands & shrublands

BS-Bureau Sensitive, C- State Candidate, D-Documented, E-State Endangered, FC-Federal Candidate, M-State Monitored, PE-Proposed Endangered S-Sensitive, X-Extirpated or historically present
*These species are documented or suspected in the San Juan Islands as a whole, not necessarily within the Monument.

Wildlife Analytical Issue 1: *How would changes in the quality and quantity of habitat and plant communities affect wildlife species and fishes (including sensitive species) under each alternative?*

Affected Environment

As described under Habitat and Plants Issues 1 and 2, the Monument is composed of various plant community classes. Each of these plant communities supports an array of wildlife, generally referred to as a wildlife habitat association or guild (Johnson and O'Neil 2001). This section discusses the plant communities identified on the Monument in the context of wildlife habitat. For the current condition and trend of each plant community, as well as for the analysis of how the alternatives would affect these communities, please refer back to the Habitat and Plants section.

For a complete list of known wildlife species within the San Juan Islands and their habitat associations, please see Appendix V.

Forest and Woodland Habitat Association

At more than 800 acres, the forest and woodland habitat type encompasses the majority of the Monument. Monument forests and woodlands support a multitude of migratory and resident birds, small mammals, amphibians, and terrestrial mollusks. While some wildlife species occur in only a particular forest type, many others are generalists and can occur throughout the Monument's forest and woodlands and/or transition zones and adjacent habitat.

Species that may use forests and woodlands within the Monument include, but are not limited to, olive-sided flycatchers (*Contopus cooperi*), pileated woodpecker (*Hylatomus pileatus*), Townsend's big-eared bat, bats in the genus *Myotis*, and Pacific tree frog (*Pseudacris regilla*). Species such as the bald eagle, pileated woodpecker, purple martin (*Progne subis*), little brown myotis, and Townsend's big-eared bat use large diameter live trees and snags (i.e., standing, dead trees) for roosting, nesting, or foraging. Sharptail snakes may occur in the oak habitat that remains within Monument lands (mostly at Kellett Bluff on Henry Island), though the San Juan Islands are near the northern extent of its range.

In the past, golden eagle use of the San Juan Islands was greater than today. The numbers of eagles documented on the islands has been declining since the 1970s (Milner 2017a). The last documented active golden eagle nest in the San Juan Islands was in the late 1990s (Milner 2017b). Today, golden eagles may occasionally use Monument habitats, though fewer than 20 sightings have been submitted to ebird for all of Lopez Island and San Juan Island (Sullivan et al. 2009). Because golden eagles rarely nest in trees, forest conditions are unlikely to affect this species, unless they affect prey species.

Monument forests include some relatively undisturbed, older stands of trees that may have the potential to provide nesting habitat for marbled murrelet and purple martin. However, there are currently no known occurrences of marbled murrelet nesting within the Monument (WDFW 2015b), and the U.S. FWS did not include the San Juan Islands in its designation of critical habitat for the species (U.S. FWS 2011)., Purple martins will nest in a variety of natural cavities or artificial cavities (e.g. hollow pilings, nest boxes, gourds), often selecting locations over water. Purple martins will forage over a variety of habitat types, but often fly over small woodland openings, fields, ponds, and marshes (Wiggins 2005).

Townsend's big-eared bat forages in a variety of dry and moist forest types ranging from riparian-wetlands, lowland conifer-hardwoods, to mixed-highland conifer forests. In eastern Washington, they have also been found to use mature and young-aged forests less than recently pre-commercially thinned forests or clear-cuts (Woodruff and Fergusen 2005). Townsend's big-eared bat also use a variety of roosts, including mines, abandoned buildings, attics, and hollow snags as roosts (WDFW 2005). Little brown myotis can take advantage of many different habitats, foraging and roosting in a variety of locations, including roosting under the loose bark of snags or dying trees (Randall et al. 2014).

Grasslands and Shrublands Habitat Association

Monument grassland and shrublands habitats support a variety of migratory and resident birds, small mammals, amphibians, and terrestrial mollusks.

The Monument's grasslands have the potential to support the rare island marble butterfly, as described further in Wildlife Issue 3. Another species of interest found in this habitat is the Shaw Island Townsend's vole, which is considered restricted to the San Juan Islands. While not found on all islands in the archipelago, it is abundant on the islands where it occurs. This subspecies is BLM sensitive; WDFW identifies it as a "monitor" species.

Other species that may use Monument grasslands and shrubland include, but are not limited to, northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius)*, savannah sparrow (*Passerculus sandwichensis*), short-eared owl, purple martin, and peregrine falcon. Ebird includes one record of gyrfalcon, a BLM sensitive and State monitored species, on San Juan Island from October of 1990 (Sullivan et al. 2009). If this species makes use of the Monument, it would only be for occasional hunting during the winter months (Booms et al. 2008).

Peregrine falcon hunt within the Monument's grasslands and shrublands and nest on rocky headlands at both Watmough Bay and Kellett Bluff. There are thirteen records of short-eared owls on San Juan Island in ebird (Sullivan et al. 2009). The short-eared owl is a specialist that requires open habitats such as wetlands or grasslands for nesting and hunting.

Nearshore Habitat Association

At the interface of the terrestrial and marine environment, nearshore habitat is important for a variety of seabirds, marine mammals, fish, marine invertebrates, and other wildlife species. Marine mammals haulout on the Monument's rocky shorelines and beaches. The exposed rocks, cliffs, and driftwood along the shoreline provide nesting habitat for a variety of birds, including peregrine falcon and black oystercatcher (*Haematopus bachmani)*. While the BLM's jurisdiction ends at mean high tide, the analysis considers the indirect impact of the draft alternatives on nearshore habitat and species below mean high tide as well as above.

Harbor seals are the most abundant marine mammal encountered in the area, but California and Stellar sea lions and elephant seals may also make use of Monument shoreline at times. The WDFW has identified many of the isolated rocks and islands as important marine mammal haulouts (Jefferies et al. 2000); most of the Monument's shorelines have the potential for use by pinnipeds.

Several groups of fishes use nearshore marine habitats in the San Juan Islands, including forage fish, salmonids, rockfish, and green sturgeon. Occurrence and life history of listed species are described in the Wildlife section of Appendix E. Forage fish that utilize nearshore environments in the San Juan Islands include Pacific herring (*Clupea pallasii*), surf smelt (*Hypomesus pretiosus*), and Pacific sand lance (*Ammodytes hexapterus*). Forage fishes are an important part of the marine food web as prey items for sensitive salmonids, foraging raptors (such as osprey (*Pandion haliaetus*)), and marine mammals. Other species using deeper habitats (e.g., ling cod, greenling, flounder, halibut) are not addressed here since they are unlikely to be affected by BLM management in that sediment delivery is unlikely to occur in these habitats due to distance and dispersal.

Other species that use nearshore habitat near the Monument include, but are not limited to, pelagic cormorant (*Phalacrocorax pelagicus*), double-crested cormorant (*Phalacrocorax auritus)*, pigeon guillemot (*Cepphus columba*), glaucous-winged gull (*Larus glaucescens*), and osprey. While an inventory of nesting sites is not available, seabirds are known to nest along Monument shorelines.

Wetlands Habitat Association

The limited freshwater resources within the San Juan Islands make the Monument's wetlands particularly important habitats for wildlife that depend on them, especially amphibians and waterfowl. All wetlands within the Monument are found on Lopez Island. At approximately 30 acres, Chadwick Marsh is the largest of the Monument's wetlands. The freshwater wetland behind Watmough Bay (Watmough Bay wetland) is approximately 5 acres and the forested wetland at Point Colville is approximately 2 acres.

Species that may use wetlands within the Monument include, but are not limited to, Pacific tree frog, roughskin newt (*Taricha granulosa*), long-toed salamander (*Ambystoma macrodactylum*), red-winged blackbird (*Agelaius phoeniceus*), northern pintail (*Anas acuta)*, mallard (*Anas platyrhynchos)*, trumpeter swan (*Cygnus buccinators)*, and great blue heron (*Ardea herodias)*. Species like the rough-skinned newt depend on these freshwater habitats and small changes to the suitability or size of the wetlands available could negatively affect these species. Other species, such as purple martins (*Progne subis*), common loons, black swifts (*Cypseloides niger*), and little brown myotis do not depend exclusively on wetlands, but opportunistically use them as a food sources, nesting areas, hiding cover, or as a water source.

No fish species have been positively identified in Monument wetlands (and none are specifically analyzed in this EIS), though the Chadwick Hill wetland may provide habitat for fish species based on remains found nearby by a BLM partner.

Effects of the Alternatives

The effects of the alternatives on wildlife vary depending on how the quantity and quality of the associated habitat would change. More detailed analysis is provided for each habitat type below. Table 68 and Table 69, below, summarize effects from changes in habitat to both general wildlife associations and to specific special status species.

Forest and Woodland Habitat Association

No Action Alternative

Under the No Action Alternative, vegetation management would be limited to removal of hazard trees and minimal treatment of invasive plants. The BLM estimates that forests and woodlands would expand by an estimated 17 acres under this alternative (see Table 7 on page 75) and forest canopies would continue to close. Under these circumstances, wildlife that prefer more densely stocked, coniferous forest would benefit most. The No Action Alternative would negatively affect wildlife that prefer shade

intolerant tree species or open forest due to the continued increasing density of forest canopy cover and the encroachment of forest species in grasslands.

The continuation of custodial management would have a minimal effect on bald eagle, pileated woodpecker, and Townsend's big-eared bat. The BLM would continue to remove the large diameter trees used by these species for perching, nesting, or foraging only where they are hazardous to humans or structures; the availability of such trees would increase slightly over the life of the plan as dominant trees mature. *S*everal of these species use snags for perching, nesting, and foraging (Bull and Jackson 2011, U.S. FWS 2007, Adams 2001). Continued custodial management would potentially result in greater snag resources due to the vulnerability of trees in densely stocked forests to insects and diseases. This could also improve forage for insectivores, including the pileated woodpecker and the brown creeper.

Under the No Action Alternative, forest roosting conditions for Townsend's big-eared bat, long-legged myotis, hoary bat, silver-haired bat, and little brown myotis would improve over the life of the plan. As trees mature, become susceptible to disease, and eventually die, roosting habitat would become more available for these species. In the No Action Alternative, the lack of fire or timber cutting would result in some decreases in foraging habitat for these bats species. Most of the bats on the Monument are able to fly and echolocate more effectively and efficiently in woodlands and forest stands that have older stand qualities, mainly low or moderate understory clutter, and/or some small openings within them (Brigham et al 1997, Loeb and O'Keefe 2006, Smith and Gehrt 2010).

Continuation of current management would negatively affect species that prefer open forests and/or forest openings, such as merlin, short-eared owls, and olive-sided flycatcher (Warkentin et al. 2005, Altman and Sallabanks 2012). Increasing tree density over the life of the plan would degrade hunting habitat for merlin and flycatchers. Under this alternative, oak woodlands would continue to decline in the Monument, reducing the potential habitat for sharptail snakes *(Contia tenuis*) (Milner 2017a).

Alternative A

Under Alternative A, the BLM would allow current trends to continue until specified thresholds have passed. The BLM assumes that this would result in the continuation of limited vegetation management over the life of the plan. Impacts to wildlife from this limited approach would be very similar to under the No Action Alternative. As under the No Action Alternative, the BLM estimates that forests and woodlands would expand by 17 acres and forest canopies would continue to close.

Alternative B

Under Alternative B's habitat and plant communities objectives, forests and woodlands within the Monument would decrease by approximately 50 percent. In order to meet this alternative's objectives, the BLM estimates that it would undertake treatments primarily in what are now succession class B forests (i.e., relatively young forests with a closed canopy, see Table 8 on page 78) in order to expand grasslands and shrublands. In addition, the BLM estimates that it would conduct thinning to promote the growth of large old trees and oaks and other shade intolerant tree species that are currently in decline. The BLM assumes that it would use prescribed fire to promote the health of oak woodlands and potentially restore some woodland to oak savanna.

Species such as the bald eagle, pileated woodpecker, hoary bat, little brown myotis, and Townsend's big-eared bat, that use forest habitat for perching, nesting, roosting or foraging would generally be negatively affected by the decrease in this habitat type under Alternative B. For example, loss of forest habitat, particularly near shorelines, would reduce some perching sites near preferred bald eagle hunting areas though taller, older, over-story trees would generally be retained. Retention of older aged trees and some snags would provide roosting habitat and characteristics of a mature forest with available space for foraging (Loeb and O'Keefe 2006, Smith and Gehrt 2010). Over time, thinning and pruning treatments that support hardwood and large and old tree growth would improve potential nesting and roosting habitat in the remaining forests and woodlands. Use of prescribed fire may increase snag availability if some

mature trees are lost during implementation, benefiting species that make use of dead trees, such as bald eagles and most bats associated with the Monument.

Potential hunting habitat for golden eagles would expand under Alternative B. This uncommon species could benefit from additional acres of open grasslands and shrublands where prey could be found, such as non-native rabbits and eastern red foxes (*Vulpes vulpes fulvus*), though foxes occur only on San Juan Island.

Alternative C

Under Alternative C, effects on species associated with forests and woodlands would be similar to under Alternative B. Under both alternatives, the BLM would substantially reduce the acreage of forest and woodland habitat within the Monument. However, the BLM would convert less forest acreage to grassland or shrubland under this alternative than under Alternative B. Those species that require forest would be negatively impacted by Alternative C, but not as much as under Alternative B. Species that utilize large diameter trees or snags may benefit from thinning in remaining forests and increased snag availability due to prescribed fire, but those benefits are unlikely to ameliorate the loss of forest habitat.

Alternative D

Under Alternative D, the BLM would maintain forested habitat at its current extent and condition in the Monument. Habitat for forest and woodland associated species would remain much as it is today and effects would be similar to those discussed under the No Action Alternative or Alternative A. Occasional treatments to maintain the current canopy cover would support a consistent stand density and understory, although the diameter of trees would gradually increase, benefitting species that utilize large diameter trees such as bald eagle and pileated woodpecker.

Conclusion

The No Action Alternative and Alternative A would result in continued canopy closure, which would benefit wildlife species that prefer denser forest conditions. Alternatives B and C would substantially reduce acres of forested habitat in the Monument, which would negatively affect species that depend on these habitats. Additionally, the BLM would treat remaining forest and woodlands to reduce tree density and to favor tree species that are currently declining in the San Juan Islands, such as oaks and other hardwoods. This would have a negative impact on species such as the pileated woodpecker, that prefer more closed canopy forest conditions with a high prevalence of diseased and infested trees. Thinning forests and creating forest openings would benefit species such as merlin, short-eared owls, and olive-sided flycatcher. Under Alternative D, Monument forests would remain much as they are currently; the BLM would not expect substantial changes to forest wildlife populations within the Monument.

Cumulative Effects of Changes to Habitat Quantity and Quality on Forest and Woodland Associated Species

The majority of forest and woodland habitat available to wildlife within the San Juan Islands is managed by private landowners, the National Park Service, and the State of Washington. The Monument includes less than 2 percent of the Southern Vancouverian Dry Foothill Forest and Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens Forest macrogroups that occur in the San Juan Islands. The BLM assumes that current management would continue on all non-Monument lands.

While a variety of past management actions have affected forest and woodland habitat in the San Juan Islands, the primary agents were the end of fire as a management tool on the landscape and timber harvest after Euro-American settlement. These actions have altered the historic condition, extent, and distribution of forest and woodland habitat in the San Juan Islands.

Other than hazard tree removal, there is currently limited active management of forest and woodland habitat occurring on public lands in the San Juan Islands. The San Juan County Land Bank is restoring Garry oak woodland on approximately 25 acres of land on Orcas and San Juan islands (Habbeger 2017). There remains some small-scale timber harvest occurring on private lands, including management

intended to reduce the density of the forest canopy and enhance oak woodlands (Northwest Natural Resources Group 2017, Rainshadow Consulting 2017).

Reasonably foreseeable actions that are likely to affect forest and woodland habitats in the San Juan Islands over the life of the plan include continued forest succession leading to more densely stocked forest stands, continued harvest and removal of forests, wildfires, gradual loss of the hardwood component of forests, insect and disease influences on forest habitat, and loss of forest to agricultural and urban development.

Under all alternatives, the Monument will continue to contribute only a small percent of the habitat available in the San Juan Islands for forest and woodland associated wildlife. Under the No Action Alternative and alternatives A and D, the Monument would continue to contribute less than 2 percent of the Southern Vancouverian Dry Foothill Forest and Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens Forest macrogroups that occur in the San Juan Islands.

Under alternatives B and C, the BLM would reduce the acreage of forest habitat within the Monument would by approximately 50 percent. This would result in a decrease of less than 1 percent of the Southern Vancouverian Dry Foothill Forest and Tsuga heterophylla - Picea sitchensis - Sequoia sempervirens Forest macrogroup acres in the San Juan Islands; would not be a substantial decrease relative to the amount of forest available to wildlife within the San Juan Islands. Under alternatives B and C, the BLM would enhance woodland habitats and open forest conditions, which are declining in the San Juan Islands.

Because less than 2 percent of the forest habitat in the San Juan Islands would be managed under the Approved RMP, the BLM does not expect any of the alternatives to contribute to the need to list and BLM special status species or bring any currently listed species closer to extinction.

Grasslands and Shrublands Habitat Association

No Action Alternative

Under the No Action Alternative, the BLM would continue to conduct minimal vegetation treatments in grassland and shrubland habitat. Invasive plant species and forest species would continue to expand and the extent of these habitats in the Monument would decrease by approximately 13 percent (17 acres) over the next 20 years. Some Bureau sensitive species, including the gyrfalcon, short-eared owl, little brown myotis, Shaw Island Townsend's vole, and Townsend's big-eared bat would lose open habitat or edge habitat for foraging and hunting in the continued absence disturbance such as fire or tree removal beyond small-scale managerial activities.

Wildlife that hunt and forage in grasslands and shrublands, such as peregrine falcons, would experience a reduction in Monument habitat available for this activity. However, the continued expansion of invasive plants and forest species in these habitats would be unlikely to substantially change prey availability in the remaining Monument grassland and shrubland. Similarly, species that nest or burrow in grasslands and shrublands would experience a 13 percent decrease in Monument habitat available for these activities.

Under the No Action Alternative, potential habitat for island marble butterfly within the Monument would decrease over the next 20 years. While this species does not currently occur within the Monument, this could affect the availability of habitat for future occupation (see Issue 3, below).

Alternative A

Under Alternative A, the BLM would allow current habitat and vegetation trends to continue until specified thresholds as passed. The BLM assumes that this would result in the continuation of limited vegetation management over the life of the plan. Because of this, effects to wildlife associated with grassland and shrubland from vegetation management under Alternative A would be very similar under the No Action Alternative. The BLM estimates that there would be a small increase in vegetation treatments to address invasive plants, but this is unlikely to affect habitat suitability for wildlife. Open-space habitat types would continue to decline in quantity and quality for associated BLM sensitive species, such as the short-eared owl, Townsend's big-eared bat, and Shaw Island Townsend's vole.

Alternative B

Under Alternative B, Monument grassland and shrubland habitat would increase by approximately 313 percent (from 126 acres to 520 acres). Efforts to increase plant diversity would improve the overall suitability of grasslands and shrublands as potential habitat for species like the island marble butterfly. Species expected to benefit from maintaining and restoring open-spaces and edges associated with grassland and shrublands include Townsend's long-eared bat, olive-sided flycatchers, short-eared owl, peregrine falcon, merlin, and golden eagle. Additionally, this alternative could create potential habitat for sharptail snakes through restoration and maintenance of oak habitats. Species that hunt and forage in grasslands and shrublands, such as peregrine falcons and golden eagles, may see modest increases in prey availability within the Monument. Under Alternative B, habitat for grassland and shrubland associated wildlife would increase by the greatest amount out of all of the alternatives.

Alternative B would have a mixed impact on species that require both forests and open habitats, like the merlin. Forest nesting habitat would decrease, but the quantity and quality of hunting habitat would improve.

Alternative C

Under Alternative C, Monument grassland and shrubland habitat would increase substantially (from 126 acres to 487 acres). Compared to Alternative B, the BLM estimates that it would undertake more intensive efforts to treat non-native vegetation and approximate native historic plant communities. Species that would benefit from these treatments would be the same as those described under Alternative B. Alternative C would also have the same effect as Alternative B on species that require both forests and open habitats.

Alternative D

Under Alternative D, the BLM would maintain the current acreage and condition of Monument grasslands and shrublands. This alternative would not increase the suitability or acreage of these habitats. There would be no loss in habitat or substantial changes in suitability and so the Monument would continue to provide the current level of support to grassland and shrubland associated wildlife.

Conclusion

Alternative B would be most beneficial to wildlife species associated with grasslands and shrublands because it would provide the greatest increase in acres of this habitat within the Monument. Alternative C would provide almost as large an increase as Alternative B (394 acres compared to 361 acres). Under both alternatives, the BLM would improve habitat condition by undertaking treatments to control invasive plant species and enhance the cover and diversity of native plant associations; the BLM would conduct more intensive restoration efforts under Alternative C. Overall, alternatives B and C would create more suitable habitat for species like the island marble butterfly, short-eared owl, Townsend's long-eared bat, Shaw Island Townsend's vole, and merlin. The No Action Alternative and alternatives A and D would not substantially affect grassland habitat, though some acreage of grassland would be lost to conifer and shrub encroachment under the No Action Alternative and Alternative A.

Cumulative Effects of Changes to Habitat Quantity and Quality on Grassland and Shrubland Associated Species

Throughout the Puget Lowland Ecoregion, which includes the San Juan Islands, both native and non-native grassland habitat covers an estimated 9 percent of the pre-Euro-American settlement extent of native grassland (Chappell et al. 2000). The Monument currently encompasses approximately 1.2 percent of the Southern Vancouverian Lowland Grassland and Shrubland occurring within the San Juan Islands.

Outside of the Monument, ongoing projects have the potential to enhance grassland and shrubland habitat in the San Juan Islands. On June 5, 2012, the National Park Service published a notice of intent to prepare a Prairie Stewardship Plan and Environmental Impact Statement for the San Juan Island National Historical Park (National Park Service 2012). This restoration effort would include prairie at the San

Juan Island National Historical Park that is in close proximity to Monument land at Cattle Point. The Nature Conservancy has ongoing vegetation restoration projects on 11-acre Yellow Island, which has a small amount of grasslands.

Reasonably foreseeable activities that could negatively impact grasslands in the San Juan Islands include continued tree and shrub encroachment, continued invasion and expansion of non-native plants, continued herbivory by deer and European rabbits, continued impacts from recreation (erosion, vegetation trampling, etc.), and development and conversion to agricultural uses. Due to lack of predation and hunting pressure, black-tailed deer populations within the San Juan Islands have expanded and are influencing vegetative cover and wildlife habitat. Arcese et al (2014) found that the cover, richness, and diversity of native and culturally important shrubs were 52–85 percent lower at sites in the Salish Sea region with abundant deer.

Under the No Action Alternative and Alternative A, there would be an estimated 17 acres of grasslands and shrublands lost within the Monument. This would decrease the total acreage of this habitat in the San Juan Islands by 0.2 percent. Under alternatives B and C, grassland and shrubland habitat in the Monument would expand by 394 acres and 361 acres respectively. This would increase the total acreage of this habitat type in the San Juan Islands by approximately 3 percent. Under both alternatives B and C, the diversity and cover of the native plant community within the Monument's grasslands and shrublands would improve over the life of the plan, and providing some counter to the overall regional decline of this habitat. Under Alternative D, the Monument's contribution to the supply of grassland and shrubland habitat in the San Juan Islands would remain unchanged.

Because less than 2 percent of the available San Juan Islands grassland and shrubland habitat would be affected, the BLM does not expect any of the alternatives to contribute to the need to list and BLM special status species or bring any currently listed species closer to extinction.

Nearshore Wildlife Association

No Action Alternative

As described under Issue 2 of the Habitat and Plants Section, under the No Action Alternative the impact of the BLM's management on nearshore habitat would remain relatively unchanged from existing conditions. Vegetation treatments would continue to be limited to hazard tree removal and limited mechanical treatments of invasive species (approximately 20 acres per year). This level of treatment would continue to cause negligible sediment delivery to nearshore habitats.

The minor amount of sediment delivery that may be occurring from the approximately 9 miles of Monument trail within 200 feet of shoreline could continue to cause some disruption of both juvenile salmonid (smolt) rearing, refuge, and feeding and juvenile stage rockfish refuge and forage. Sediment affects both water quality and the presence and availability of invertebrate prey for salmonids (50 CFR 226.212), a visual predator. This sediment deposition would result in continued depression of the carrying capacity of fishes using nearshore habitats compared with historic habitat support, particularly for those species relying on seagrass beds, which are susceptible to loss or decline with sediment deposition and turbidity (WDNR 2015b).

Under the No Action Alternative, the BLM would continue to allow recreational boat landing on all 21.2 miles of Monument shoreline. Boat landings would continue to lead to a minor amount of removal of seagrass beds or kelp habitat and a corresponding reduction in juvenile salmonid and juvenile stage rockfish rearing, refuge, and feeding in impacted areas.

Under the No Action Alternative, there would continue to be no plan-level decisions related to shoreline stabilization. While the BLM has only undertaken soft stabilization in the past, hard stabilization could be applied were it would more effectively protect at-risk cultural resources. Soft stabilization would have limited long-term impacts on nearshore wildlife. Hard stabilization would permanently remove any habitat within the stabilization footprint along and increase disturbance to nearby habitat through changes

in sediment delivery, sand and sediment re-distribution, and potential loss or damage of habitat elements such as eelgrass. This would lead to a decline in both the extent and quality of habitat for juvenile salmonid rearing, refuge, and feeding and juvenile stage rockfish refuge and forage.

Non-aquatic wildlife that make use of the nearshore environment, such as bald eagle and common loon, would be largely unaffected by sediment from vegetation treatments. The continued increase in forest vegetation could improve perching and hunting habitat for bald eagles that use shoreline trees and rocks when looking for fish.

The BLM would continue with custodial management of cultural resources, including undertaking site-specific stabilization and rehabilitation projects as necessary to protect them. Hard shoreline stabilization would alter available beach foraging habitat for migratory birds and nearshore species such as black oystercatchers (Gianou 2014). As described above, hard shoreline stabilization would reduce spawning habitat for forage fish. This would negatively affect prey species for marbled murrelet, common loon, rhinoceros auklet (*Cerorhinca monocerata*), bald eagle, and marine mammals (Gianou 2014).

In summary, under the No Action Alternative, nearshore habitat would continue to provide approximately the same level of refuge and forage for fish as under current conditions. The Monument would also continue to provide the current level of support to birds and marine mammals associated with nearshore habitat.

Alternative A

Under Alternative A, the BLM would take a relatively passive approach to vegetation management (Table 17 on page 111). There would continue to be negligible sediment delivery to nearshore habitats from these limited vegetation treatments.

Under Alternative A, the BLM would prohibit recreational use of the Monument, though it would continue to facilitate access for scientific, educational, cultural, and spiritual purposes. This would minimize impacts to nearshore habitats and wildlife from both removal of nearshore vegetation (e.g., eelgrass) through boat landing and sediment deposition from trails. Improvements in seagrass beds and kelp bed habitat due to reductions in disturbance and sediment deposition could increase juvenile salmonid rearing, refuge, and feeding and juvenile stage rockfish refuge and forage.

The BLM would exclusively use soft stabilization methods to protect at-risk cultural resources under Alternative A. Impacts from soft stabilization would be the same as those described in the No Action Alternative; nearshore fish, birds, and marine mammals would not be subject to the greater decline in their habitat that would occur from hard stabilization methods.

The improvement in fish carrying capacity would benefit wildlife that use the nearshore environment to hunt, including bald eagles, common loons, rhinoceros auklets, and harbor seals (*Phoca vitulina)*. The continued increase in forest vegetation could also improve perching and hunting habitat for bald eagles that use shoreline trees and rocks when looking for fish.

In summary, under Alternative A, impacts from boat landings and trails would decline and impacts from sediment delivery due to vegetation treatments would remain at the current level. This would lead to higher nearshore habitat quality, which the BLM predicts would increase the carrying capacity of both nearshore forage fishes (e.g., eulachon) and the fishes (such as sensitive salmonids), birds, and marine mammals eating forage fishes and nearshore aquatic invertebrates.

Alternative B

Under the objectives for Alternative B, the BLM would undertake extensive vegetation treatments to enhance limited plant communities and increase species and structural diversity within the Monument. Alternative B would produce the most sediment deposition from vegetation treatments of any alternative other than other than sub-Alternative C (see Habitat and Plants Issue 2). However, due to travel distance through vegetated conditions, the BLM predicts that this sediment increase would be within historic

ranges in sediment delivery, and would not be expected to change the extent or species composition of nearshore plant communities such as seagrass beds.

Under Alternative B, there would be an approximately 7 percent increase in trails within 200 feet of the shoreline compared to the No Action Alternative. These trails would only be open to hiking and closed to equestrian and bicycle use.

The BLM would prohibit recreational use, including recreational boat landing, on all marine rocks and rock groupings and at Watmough Bay (see Appendix O for Category A Rocks, Category B Rocks, and Watmough Bay RMA frameworks). Impacts from recreational boat landing, the BLM would continue to allow on 16.4 miles of Monument shoreline, would be more than under Alternative A but less than all other alternatives. The prohibition on recreational boat landings at Watmough Bay could increase fish abundance and/or production in the most important forage fish spawning habitat area adjacent to the Monument.

Under Alternative B, the BLM could undertake hard shoreline stabilization, in addition to soft stabilization, as needed to protect cultural resources. Given the greater ecological impacts of hard stabilization, the BLM is likely to use soft stabilization in most cases. Where the BLM applied hard stabilization, it would lead to a decline in both the extent and quality of habitat for juvenile salmonid refuge and feeding, and juvenile-stage rockfish refuge and forage, as well as for nearshore birds and marine mammals.

The decline in fish carrying capacity would negatively affect some wildlife that hunt in the nearshore environment, including bald eagles, common loons, rhinoceros auklets, and harbor seals. In addition to affecting prey species, hard shoreline stabilization would substantially alter beach foraging habitat for nearshore species and migratory birds such as black oystercatchers (Gianou 2014). If the BLM removed trees along Monument shoreline as part of grassland/shrubland restoration or forest health treatments, perching habitat for bald eagles that use shoreline trees when looking for fish could decrease as well.

In summary, under Alternative B, sediment deposition from vegetation treatments and trails would increase. This could lead to: a) indirect effects on nearshore fishes through loss of seagrass beds or other seagrass habitats b) indirect effects on birds and marine mammals that feed on nearshore fishes, and c) direct impact to nearshore fish production, through turbidity and water quality impacts on fish foraging and invertebrate prey bases. The effect would likely be strongest on fishes using sand areas and seagrass beds. This could decrease the carrying capacity of nearshore fishes including both forage fishes (e.g., eulachon), and the fishes eating forage fishes and nearshore aquatic invertebrates, such as sensitive salmonids (see Table 66). Impacts to deeper marine species such as adult rock fishes or migrating salmonids would be less than to species in shallower habitat. In addition to increased negative impacts from increased sediment delivery, there would also be a positive effect from the decrease in boat landing in Watmough Bay and around marine rocks, which could lead to an increase in abundance and/or production in these specific locations.

Alternative C

Under the objectives for Alternative C, the BLM—likely working with tribes and other partners—would undertake extensive treatments to approximate historic vegetation conditions within the Monument (see Issue 3 for estimated treatment types and acres). Alternative C would contribute the second-most sediment of any alternative related to vegetation management (see Habitat and Plants Issue 2).

Under Alternative C, there would be an approximately 28 percent decrease in Monument trails within 200 feet of the shoreline compared to the No Action Alternative. The decline in trail miles would lead to less sediment deposition from trails than under the No Action Alternative and alternatives B and D, but more than under Alternative A.

The BLM would prohibit recreational use, including recreational boat landings, on smaller and/or more sensitive rocks and rock groupings; motorized boat landings would be prohibited at Watmough Bay (see

Appendix O for Category B Rocks and Watmough Bay RMA frameworks). Impacts from recreational boat landing, which the BLM would continue to allow on 17.8 miles of Monument shoreline, would be greater than under Alternative A and Alternative B, but less than under the No Action Alternative and Alternative D. The prohibition on motorized recreational boat landings at Watmough Bay could improve fish abundance and/or production in the most important forage fish spawning habitat area adjacent to the Monument.

The BLM would exclusively use soft stabilization methods to protect at-risk cultural resources under Alternative C. Impacts from soft stabilization would be the same as those described in the No Action Alternative; nearshore fish, birds, and marine mammals would not be subject to the greater decline in their habitat that would occur from hard stabilization methods.

The decline in fish carrying capacity would negatively affect some wildlife that hunt in the nearshore environment, including bald eagles, common loons, rhinoceros auklets, and harbor seals. If trees the BLM removes trees along Monument shoreline as part of grassland/shrubland restoration or forest health treatments, perching habitat for bald eagles that use shoreline trees when looking for fish could decrease as well.

In summary, under Alternative C, there would likely be a net increase in sediment deposition given the increase in vegetation treatments, though less sediment deposition would occur than under Alternative B and Sub-Alternative C. Increased sediment deposition could affect fish abundance and/or production in adjacent nearshore environments. The effect would likely be strongest on fishes using sand areas and seagrass beds. This could somewhat decrease the carrying capacity of nearshore fishes including both forage fishes (e.g., eulachon), and the fishes eating forage fishes and nearshore aquatic invertebrates, such as sensitive salmonids (see Table 66). This would have a negative indirect effect on birds and marine mammals that feed on nearshore fishes. Impacts to deeper marine species such as adult rock fishes or migrating salmonids would be less than to species in shallower habitat. In addition to increased negative impacts from increased sediment delivery, there would also be a positive effect from the decrease in boat landing in Watmough Bay and around smaller/more sensitive marine rocks, which could lead to an increase in abundance and/or production in these specific locations.

Sub-Alternative C

The effects to nearshore fishes under Sub-Alternative C would be similar to those under Alternative C. Under Sub-Alternative C, the acres of vegetation treatments would likely increase as the BLM attempted to achieve ambitious restoration objectives without the use of herbicide (see Issue 3 for estimated treatment types and acres). Sub-Alternative C would produce the most sediment deposition from vegetation treatments of any alternative.

This increased sediment deposition would amplify the impacts described under Alternative C and could further decrease the carrying capacity of nearshore fishes including both forage fishes (e.g., eulachon), and the fishes eating forage fishes and nearshore aquatic invertebrates, such as sensitive salmonids (see Table 66). The decline in fish carrying capacity would negatively affect some wildlife that hunt in the nearshore environment, including bald eagles, common loons, rhinoceros auklets, and harbor seals.

Alternative D

Under the objectives for Alternative D, the BLM would undertake relatively modest acres of treatments to maintain approximate current vegetation conditions (see Issue 3 for estimated treatment types and acres). This small estimated acreage of vegetation treatments would lead to slightly more sediment production than the No Action and Alternative A, but far less sediment production than alternatives B and C. The BLM predicts that this small amount of sediment would lead to no measurable change in nearshore habitat conditions and no change in fish use or abundance.

Under Alternative D, there would be an approximately 38 percent increase in trails within 200 feet of the shoreline compared to the No Action Alternative. Alternative D would have the largest amount of trail-related sediment production associated with any alternative.

Impacts from recreational boat landings would increase slightly under this alternative. Recreational boat landings could continue on all 21.2 miles of Monument shoreline; the BLM would also increase acres of land open to designated site camping for visitors arriving by non-motorized boat. The development of new campsites during plan implementation would lead to the increase of landings at these locations. This could lead to an increase in the removal of seagrass or kelp habitat and a corresponding reduction in juvenile salmonid and juvenile stage rockfish rearing, refuge, and feeding in impacted areas.

Under Alternative D, the BLM could undertake hard stabilization of shorelines, in addition to soft stabilization, as needed to protect cultural resources outside of areas managed for their wilderness characteristics. Areas managed for their characteristics under Alternative D encompass 232 acres, including the east half of Patos Island and an array of rocks and islands (see Wilderness Characteristics on page 231 for more information). Where the BLM applied hard stabilization, it would remove or degrade the extent and quality of habitat for juvenile salmonid refuge and feeding, and the extent and quality of juvenile stage rockfish refuge and forage habitat. Based on techniques that the BLM could apply, it is logical to assume that these impacts would be intermediate between the No Action Alternative and Alternative B and alternatives A and C.

The decline in fish carrying capacity would negatively affect some wildlife that hunt in the nearshore environment, including bald eagles, common loons, rhinoceros auklets, and harbor seals. In addition to affecting prey species, hard shoreline stabilization would substantially alter available beach foraging habitat for nearshore species and migratory birds such as black oystercatchers (Gianou 2014). This alternative would maintain the current level of perching habitat for bald eagles that use shoreline trees and rocks when looking for fish.

In summary, under Alternative D, there would likely be a net increase in sediment deposition given the increase in trail miles, though less sediment deposition would occur than under alternatives B, C, and Sub-C. Increased sediment deposition, could affect fish abundance and/or production in adjacent nearshore environments, through mechanisms detailed above. The effect would likely be strongest on fishes using sand areas and seagrass beds. This could somewhat decrease the carrying capacity of nearshore fishes including both forage fishes (e.g., eulachon), and the fishes eating forage fishes and nearshore aquatic invertebrates, such as sensitive salmonids (see Table 66). This would have a negative indirect effect on birds and marine mammals that feed on nearshore fishes. Impacts to deeper marine species such as adult rock fishes or migrating salmonids would be less than to species in shallower habitat. Over time, there would also be an increase in impacts from boating landing, which could lead to a decrease in fish abundance and/or production in affected locations.

Conclusion

The alternatives would vary in their effects on the quality and quantity of nearshore habitat. Alternative A would minimize impacts to wildlife associated with nearshore habitat by closing trails, prohibiting recreational boat landing, and using only soft shoreline stabilization techniques. Alternative B would have the largest potential impact the quality and quantity of nearshore habitat, by driving the greatest increase in sediment deposition from vegetation treatments and by allowing hard shoreline stabilization. Other alternatives would be intermediate in their effects. The BLM predicts that changes in extent or species composition of nearshore plant and wildlife communities due to sediment delivery changes would be small and within historic ranges.

Cumulative Effects of the Changes to Habitat Quantity and Quality to Nearshore-Associated Species

The Monument encompasses a small fraction of the total nearshore habitat in the San Juan Islands. Nearshore habitat in the San Juan Islands is predominantly in private ownership.

Reasonably foreseeable effects to nearshore habitat both near the Monument and within the San Juan Islands in general include shoreline erosion and modification due to rising sea levels and sediment delivery into shoreline habitats from shoreline development, vegetation management, and recreation. The alternatives would add incremental impacts to historic, current, and future impacts to nearshore wildlife in the San Juan Islands. They would add to impacts from the following actions outside of the Monument: shoreline stabilization, land clearing and other vegetation treatments, recreational and commercial fishing, and docks, marinas, and landings.

The above actions are regulated by the ESA and State regulations including the Joint Aquatic Resources Permit Application. The majority of shoreline development and impact has occurred historically. Over 600 marine shoreline alterations have been identified in San Juan County (San Juan County 2013); these modifications are part of the affected environment for the Monument and adjacent areas. San Juan County is currently in the early planning stages to relocate a road within 200 feet of the shoreline on the south end of Lopez Island. Other than this project, the BLM is not aware of specific additional large-scale proposed shoreline alterations, although many minor alterations are permitted each year.

Recreational use in the San Juan Islands has increased and is likely to continue to increase, with correlated indirect effects on nearshore habitat similar to those described above. The cumulative effect of other foreseeable shoreline alterations and increased recreation, added to the indirect effects on nearshore habitats described above, would lead to an overall decline in nearshore habitat conditions in areas adjacent to the Monument under the No Action Alternative, Alternative B, and Alternative D. These effects would be associated with (in order of severity of impact): boat landings, hard shoreline stabilization, and indirect sediment effects. The BLM predicts that alternatives A and C would lead to overall improved nearshore habitat conditions in areas adjacent to the Monument, considering both positive (restrictions on landings and hard shoreline stabilization) and negative (temporary increases in sediment delivery) impacts on the nearshore habitat condition. For the San Juan Islands as a whole, the effects from implementation of any of the alternatives would be relatively minor when the severity of impacts, the duration of impacts, and the amount of habitat impacted is considered. The BLM estimates that at most <1 percent of nearshore habitat types would be removed (due primarily to hard shoreline stabilization), <5 percent of nearshore habitats would experience slightly reduced habitat function (due to increased boat landings and sediment delivery increased over historic ranges), leading to minor and mostly temporary changes in wildlife and fish behavior in a small area adjacent to the Monument.

Sensitive fisheries population levels are substantially below historic levels. Rockfish (*Sebastes* spp.) have substantially declined in abundance in the Puget Sound (Tonnes 2011). Following a decade of effort, many salmonid species, including some listed chinook and steelhead runs, are consistently below recovery goals and decreasing (Governor's Salmon Recovery Office 2014). The BLM does not expect the contribution of effects from these alternatives to change the cumulative negative trends in sensitive fish populations. However, no fishes would be made more sensitive solely through the incremental indirect impacts described for these alternatives. The incremental contribution of these alternatives would not by themselves contribute to trends for listing any fish under the ESA, and would not cause an increase in protection levels for sensitive fishes (i.e., changing from threatened to endangered). Because actions under the alternatives would affect only a small percent of the available San Juan Islands nearshore habitat, the BLM does not expect any of the alternatives to increase the need to federally protect nearshore non-fish wildlife species.

Wetland Wildlife Association

No Action Alternative

Under the No Action Alternative, there would continue to be little to no active management of Monument wetlands. Conifer encroachment would continue to cause wetlands at Point Colville to function at risk; sediment deposition from trails would continue to have a small negative effect on all Monument wetland habitat. These small changes in habitat suitability within the Monument would likely have a nominal effect on species associated with wetlands.

Alternative A

Under Alternative A, the effects to wildlife associated with wetlands would be similar under the No Action Alternative. Little to no vegetation management would occur in wetlands under this alternative and so changes to habitat would be minimal. Under Alternative A, the eventual revegetation of trails would reduce sediment delivery from trails; this could also increase nearby vegetation cover for wildlife accessing wetlands. This small change in habitat suitability within the Monument would likely have a nominal positive effect on species associated with wetlands.

Alternative B

Under Alternative B, Monument wetland acreage would increase by approximately 30 acres. This would increase the extent of habitat available within the Monument for wetland-dependent species by approximately 80 percent. The BLM would use a variety of methods would be used to wetland function and native species diversity under this alternative, including use of pesticides to control non-native plants.

For those species that use productive wetlands for hunting or foraging, food availability would increase as wetland habitat expands. Insect populations would increase, providing a greater food source for insectivores such as purple martins, black swifts, common nighthawk (*Chordeiles minor*). While gyrfalcons are an unlikely visitor, increased habitat for waterfowl could expand hunting opportunities.

Vegetation treatments to remove invasive plants would improve native plant diversity in wetlands. Treatments to remove encroaching conifers would improve hydrologic function for the Point Colville wetland, which is currently functioning at risk. Increased sediment deposition resulting from vegetation removal, prescribed fire, and earth moving would temporarily reduce water quality and negatively impact wetland associated species, such as the rough-skinned newt (Houlahan and Findlay 2003).

Sediment delivery from trail use and vegetation treatments might also negatively affect aquatic insect populations in the short-term (Gleason et al. 2003), which would affect aerial insectivores like bats, swallows, common nighthawk, and purple martins. Overall, however, Alternative B would benefit wetland-dependent species and other wildlife that utilize wetlands during their life histories.

Alternative C

Wetland conditions would improve, but not expand, under Alternative C. The BLM would use a variety of methods to approximate historic condition, including use of pesticides to control non-native plants. Native plant diversity would increase and removal of encroaching trees would increase the function of the wetland functioning at risk at Point Colville.

Increased plant diversity and improved wetlands function should result in increased insect diversity and abundance (Hornung and Foote 2006). This would foster similar benefits to wetland-associated species as Alternative B, but at a smaller scale the BLM would not create new wetland acres. Insectivores such as bats, swallows, common nighthawk, and purple martins would benefit from higher insect prey availability with improved wetland conditions (Hornung and Foote 2006).

Sub-Alternative C

This alternative would prohibit the use of chemical vegetation treatments in the Monument. This would both eliminate the potential for negative effects from chemicals on wetlands and limit the effectiveness of efforts to approximate historic conditions. Thus increased plant diversity and the subsequent increase in insect availability would not be fully realized as compared to Alternative C. However, native plant diversity would still improve due to the mechanical methods to reduce invasive plants and the removal of encroaching trees would benefit the wetland functioning at risk at Point Colville.

Alternative D

Under Alternative D, the BLM would maintain the current size and condition of Monument wetlands. Because there would be no loss in habitat or substantial changes in suitability, the Monument would continue to provide the current level of support to wildlife that depend on or utilize wetlands. Invasive

plant populations and encroaching conifers would be maintained at approximately their current levels rather than expanding as is likely to occur under the No Action Alternative and Alternative A. Wetlands plant diversity and insect diversity could increase under this alternative if invasive plants in wetlands are successfully treated and reduced, but changes in suitability would be minimal.

Conclusion

Alternative B would be most beneficial to wildlife associated with wetland habitats. While there would be some impact to existing wetlands resulting from the large amount of vegetation treatments proposed, wetland acreage within the Monument would increase substantially, providing suitable habitat for species such as purple martin and short-eared owl. Alternative C would also benefit wetland wildlife species because of the restoration work proposed for existing wetlands within the Monument.

Alternative A would have a limited, positive impact on wetlands associated wildlife because of the closure of Monument lands to recreation. Less human access would reduce the likelihood of erosion, vegetation disturbance, and weed introduction into wetland environments. Under the No Action Alternative, wetland conditions would remain much as they are today. Under both the No Action Alternative and Alternative A, conifer encroachment would continue and the Point Colville wetland would continue to function at risk due to such encroachment. Lastly, Alternative D would have a minor negative impact on wetlands because of the expanded camping and trail-based opportunities that would occur under this alternative. Increased access would increase the likelihood of weed introduction, soil erosion, and vegetation impacts from hiking, equestrian use, bicycle use, and dispersed camping.

Cumulative Effects of the Alternatives on Wetland Associated Species

There have been historic losses of wetlands in San Juan County associated with human development (landings, harbors, docks, and housing); these losses have not been accurately quantified, but have led to the development of land use ordinances protecting wetlands (Rozenbaum 2012). More recently, approximately 20 percent of the wetland resources in the San Juan Island have been classified as potentially disturbed (based on data in WDOE 2011b).

In recent years, San Juan County and private landowners have undertaken wetland enhancement and creation on Lopez Island. Private landowners, working with Ducks Unlimited, intend to continue projects to enhance and create wetlands. Because of this, it is reasonably foreseeable that the total acreage of wetland in the San Juan Islands will increase over the life of the plan. The following actions would also affect the size and condition of wetland habitat in the San Juan Islands: private filling of wetlands for development, private creation and enhancement of wetland areas for wetland mitigation, State and Federal wetland enhancement and creation (e.g., work at Odlin Park)

Wetland development is regulated by the Clean Water Act and State regulations including the Joint Aquatic Resources Permit Application. The BLM does not know of any major new private development projects that would require wetland mitigation in the planning area. Other changes that are reasonably foreseeable for wetlands within the San Juan Islands include loss of wetlands through successional tree encroachment, climate change, and sedimentation contamination.

The alternatives would have either no effect or a positive effect on the extent of wetlands within the San Juan Islands and would either maintain or improve the condition of wetlands within the Monument. Because of this, the BLM does not expect any of the alternatives to contribute to the need to list and BLM special status species or bring any currently listed species closer to extinction

Summary Wildlife Issue 1 Conclusions

Table 68 provides a summary of effects from changes under each alternative in habitat quantity and quality on associated wildlife species. Each alterative is described as causing an improvement, decline, or no change (+,-,=) in the wildlife associated with the habitat type. Table 69 summarizes how changes in vegetation under the alternatives would affect potential habitat for associated special status wildlife.

Table 68: Summary of effects of changes in habitat under each alternative on associated wildlife species

Habitat Association	No Action Alternative	Alternative A	Alternative B	Alternative C and Sub-C	Alternative D
Grassland & shrubland associated Species	-	-	+	+	=
Forest & woodland associated Species	+/-	+/-	-	-	=
Wetland associated species	-	-	+	+	=
Nearshore associated species (impacts from sediment)	=	+	-	-	-
Nearshore associated species (impacts from shoreline stabilization)	=	+	=	+	+
Generalist species	=	=	=	=	=

Table 69: Summary of the effects of changes in habitat under the alternatives on special status wildlife

Species	No Action Alternative	Alternative A	Alternative B	Alternative C and Sub- C	Alternative D
American peregrine falcon (*Falco peregrines*)	=	=	+	+	=
Bald eagle (*Haliaeetus leucocephalus*)	+	+	-	-	=
Common loon (*Gavia immer*)	=	=	+/-	+/-	=
Gyrfalcon (*Falco rusticolus*)	=	=	+	+	=
Harlequin duck (*Histrionicus histrionicus*)	=	=	-	-	=
Island marble butterfly (*Euchloe ausonides insulanus*)	-	-	++	++	=
Lewis's woodpecker (*Melanerpes lewis*)	+	+	+/-	+/-	=
Little brown myotis (*Myotis lucifugus*)	+/-	+	+/-	+/-	=
Sandhill crane (*Grus Canadensis*)	-	-	+	+	=
Shaw Island Townsend's vole (*Microtus townsendii pugeti*)	=	=	+	+	=
Short-eared owl (*Aegolius acadicus*)	-	-	++	+	=
Townsend's big-eared bat (*Corynorhinus townsendii*)	+/-	+/-	+/-	+/-	=

Wildlife Analytical Issue 2: *How would variations in human use/disturbance under each alternative affect wildlife species and fishes (including special status species)?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

Human uses and management activities currently cause some level of disturbance to wildlife across the Monument. Activities such as hiking, horseback riding, boat landing, and camping all currently occur within the Monument and have the potential to affect wildlife. Recreation and Visitor Services Issue 1 provides estimates of current annual visitation at sites throughout the Monument (see Table 37 on page 156).

Increased tourism and shoreline development in the Salish Sea could increase the frequency of disturbance to wildlife. Marine mammals, eagles, and other favored species are often the target of ecotourists looking to either get close enough for a photo or simply see a specific species in their native habitat. This can be of concern when those actions disrupt natural behavior such as breeding or foraging, and negatively affect recruitment and survival within a population.

Vegetation treatments have short-term disruptive effects on wildlife species near the treatment; this disruption varies depending on the type and intensity of the treatment. The BLM's management of vegetation within the Monument is currently limited to approximately 20 acres of manual and mechanical treatment per year. Given the small acreage involved, it is unlikely that vegetation treatment is having a substantial disruptive effect on wildlife. The effects section addresses how changes in the intensity and extent of vegetation treatments under each alternative could affect wildlife and alter disturbance levels.

A variety of visitor activities currently occur in the Monument and are likely to cause some disturbance to wildlife. While the BLM does not have the information necessary to quantify the level of disturbance, it can quantify the extent of visitor opportunities that occur in vegetation classes within the Monument. The BLM quantified visitor opportunities within 300 feet[61] of nearshore habitats and 25 and 150 feet[62] of wetland habitats.

Forest and Woodland Associated Species

There are currently 9.2 miles of trail in Monument forest and woodland. While Monument trails are currently open to all non-motorized uses, equestrian use only occurs on approximately 1 mile of trail though forest and woodland. There is no regular use of Monument trails for bicycle access. Designated site camping is a popular activity in the Monument; this activity currently occurs within approximately 13 acres of Monument forest and woodlands. Though this activity rarely occurs, 421 acres of Monument forest and woodland are currently open to dispersed camping.

[61] A minimum distance of 300 feet is considered to be the best all-around minimum distance within which marine mammals would have above average detection and attention directed to human presence and most human related activities (NOAA 2018 access). A general setback guideline of 164 feet (50 meters) has been recommended for seabirds (Chatwin et al 2013). See Appendix B for more information.

[62] Dube et al. (2004) conclude that sediment leaving a culvert or similar source and moving across vegetated areas (a situation conservatively comparable to the analysis area) move less than 150 feet in nearly all cases. The BLM specialist identified 25 feet as an appropriate buffer within to measure direct impacts to wetlands. See Appendix B for more information.

Grasslands and Shrubland Associated Species

There are currently 5.1 miles of trail in Monument grassland and shrubland. While Monument trails are currently open to all non-motorized uses, there is no regular use of trails through grasslands and shrublands for equestrian or bicycle access. Designated site camping is a popular activity in the Monument; this activity occurs within approximately 8 acres of Monument forest and woodlands. Though this activity rarely occurs, 66 acres of the Monument grassland and shrubland are currently open to dispersed camping.

Nearshore Associated Species

There are currently 3.9 miles of Monument trail that are within 300 feet of a marine mammal haulout and 10.2 miles of trail that are within 300 feet of the shoreline. All 21.2 miles of shoreline Monument shoreline are open to recreational use. All designated site camping within the Monument occurs within 300 feet of the shoreline. While visitors are prohibited from harassing marine mammals under the Marine Mammal Protection Act, it is likely that some level of disturbance to these species occurs due to Monument visitation given the proximity of trails and camping areas to the shoreline.

Wetland Associated Species

There are currently 0.3 miles of Monument trail that are within 25 feet of a wetland and 0.9 miles of Monument trail that are within 150 feet of a wetland. There are no wetlands in any areas currently open to dispersed or designated camping.

Effects of the Alternatives

The effects of disturbance to wildlife species associated with Monument habitats vary depending on the extent of vegetation treatment and the type and extent of recreation activities and vegetation treatments allowed under each alternative. This section provides overview discussions on the type of disturbance that vegetation treatments and recreational activities could cause. These two overview discussions are followed by sections that compare the alternatives' effects on recreational opportunities and vegetation treatments within different Monument habitats.

Overview of Disturbance from Vegetation Treatments

Disturbance from vegetation treatments would vary depending on the type and extent of treatments the BLM would undertake to implement the alternative. Habitat and Plants Issue 3 provides estimates of the treatment acres that would be required during the life of the plan to accomplish each alternatives' objectives.

Vegetation management, regardless of which technique is used, can have direct effects on wildlife. Machinery use and operation, human voices and activities, vegetation trampling, and dust would occur during implementation of projects; all of these effects have the potential to displace wildlife, interrupt nesting, alter behavior, and influence animal fitness and reproductive success. The potential impacts from various types of vegetation treatments are summarized below. The estimated extent of treatments occurring in each habitat type under each alternative is addressed below.

Biological Treatments: Biological treatments can include using domestic livestock (e.g., goats) to remove undesirable vegetation or using insects or pathogens to target invasive plants. Livestock can directly harm wildlife by trampling on animals or their nests (Paine et al 1996). Disturbance to wildlife from biological treatments using insects or pathogens would be minor.

Mechanical Treatments: Mechanical vegetation removal can cause direct injury or mortality to animals during implementation. Snakes and amphibians may be unable to escape from machinery, falling vegetation, or trampling by equipment (Semlitsch et al. 2009). Treating vegetation during nesting can cause nestling mortality and reduced reproductive success (Saab at al 2011).

Prescribed fire: Use of prescribed fire can cause injury or mortality to wildlife, especially depending on the time of year. Spring burns could cause nest failure and mortality of eggs or nestlings (Dechant et al.

2002, Kruse and Piehl 1986). Fall and summer use of fire may directly cause injury or mortality to species unable to escape from fire effects, such as rodents, reptiles, and amphibians.

Human activity during treatments: Much like recreational disturbance, human activity during implementation of treatments can cause a level of disturbance that would result in displacement of animals, reduced breeding success, and higher vulnerability to predation (Steidl and Powell 2006, Edge and Marcum 1985).

Overview of Disturbance from Visitation

In general, wildlife are sensitive to human disturbance, but responses vary greatly among guilds (seabirds, marine mammals, etc.) and depending on the intensity or duration of disturbance. Researchers have documented negative effects to all wildlife taxa from hiking, equestrian use, bicycling, and camping (Boyle and Samson 1985, Miller et al 1998, Miller et al 2001, and Larson et al. 2016). Human disturbance increases vigilance in almost all wildlife species and the costs of vigilance has been well-studied (Cituti et al. 2012, Knight and Cole 1991). Any increase in human access to wildlife habitat can generally be described as having negative impacts on most wildlife species (Larson et al. 2016). The descriptions below offer an overview of disturbance to wildlife that can be cause by trail use, camping, pet access, and accessing the nearshore environment (e.g., boat landing and camping and hiking near the shoreline).

Non-consumptive recreation such as photography, hiking, boating, kayaking, and wildlife watching would generate disturbance risks to reproducing birds and animals associated with shoreline and nearshore habitat. Impacts could include flushing of birds off nests; trampling of ground-built nests, eggs, or chicks; or agitating birds out of established territories or feeding sites into less disturbed areas (Boyle and Sanson 1985). Similar displacement and annoyance type impacts could occur to adult or newborn seals basking on shore, as well as small mammals like mink, or river otter, which use the shoreline for hunting and foraging. Encounters between humans and wildlife would be more likely and impactful when people explore cross-country (as is currently allowed within the Monument). The presence of trails and recreation associated with them can alter wildlife communities or habitat availability (Miller et al 1998, Velando and Munilla 2011). It is difficult to quantify biological responses, per species, in relation to various human-created disturbances associated with recreation or other activities. Numerous variables such as line-of-site, distance, topography, season, weather or even temporal scales associated with a stimulus type (continuous or single event) or animal response (short-term alertness to long-term reproductive effects) complicate a site-specific analysis per species by disturbance type (Pater et al 2009).

Trail Use

*E*mpirical studies have shown that disturbance and the associated increased levels of vigilance in deer and other ungulates can reduce reproductive success and impact populations (Phillips and Aldredge 2002, Yarmoloy et al. 1988). Some studies indicate that the disturbance effect is greatest in response to humans on foot as opposed to on bicycles or motor vehicles (Knight and Cole 1995). This may be due to the unpredictable nature of people on foot; people on foot are more likely to leave trails, approach wildlife, or linger in areas where wildlife are present than those traveling by other means (Audrey and Knight 2003). Another possible reason for this is that humans on foot appear more like a human to animals than those in a vehicle or on a bicycle (Richens and Lavigne 1978, Eckstein et al. 1979, MacArthur et al. 1982, Freddy et al. 1986, Papouchis et al. 2001, Audrey and Knight 2003). Equestrians and bicyclists often travel more miles on trails than hikers (Audrey and Knight 2003) and thus their area of disturbance is greater, though, as just described, these modes of travel may elicit a lesser response from wildlife than hiking.

In response to increased disturbance, larger animals like deer often move to more secluded habitats when recreation levels are high (Knight and Cole 1991, Burgin and Hardiman 2012, Taylor and Knight 2003, Macarthur et al. 1982, Ciuti et al. 2012, Wisdome et al. 2004). During daylight hours, for example, deer may stay in areas of higher cover habitat farther from trails (Coppes et al. 2017). At night, use of habitat

adjacent to trails would likely increase. Some animals may choose to leave the area entirely for all or portions of the year when use is particularly high (summer and fall) (Ciuti et al. 2012).

In response to trail users, smaller animals, like birds, may continue to use habitat adjacent to trails, but nesting success may decrease near trails if they are frequently disturbed. Miller et al (1998) studied responses of multiple species of birds to recreational activities including mountain biking. They found that the presence of trails and activity along them led to change in species composition in the two habitats studied. Generalist species such as American robins (*Turdus migratorius*) were found to be more common along recreational trails. In addition, nests for all species were less likely to occur and were more susceptible to predation in areas close to trails. Disturbance to nesting birds can also result in delayed or decreased food delivery and increased exposure of eggs and nestling to predators and harsh environmental conditions (Miller at al. 1998). Interruptions to nesting also increase the likelihood of nest parasitism by cowbirds (Miller at al. 1998, Airola 1986).

Camping

Camping has an array of effects on wildlife. The typically longer duration of human occupation associated with camping, as opposed to hiking, may cause some species to habituate to the proximity of humans (Knight and Cole 1991). In addition, camping areas tend to have a higher prevalence of food (for human consumption), than hiking trails, for example. This food can act as an attractant to wildlife causing changes in habitat use and the dynamic between predators and prey (Knight and col 1991, West et al. 2016, West and Peery 2017). Food provided (intentionally or not) by recreationists can attract predators like ravens, crows, skunks, and raccoons to recreation sites making small mammals, reptiles, amphibians, and birds more susceptible to predation (West et al. 2016, West and Peery 2017).

Predictability of human behavior often mitigates some of the impacts of human disturbance on wildlife (Cuiti et al. 2012, Knight and Cole 1991). Thus, dispersed camping may cause a greater impact on wildlife than camping limited to designated sites. Dispersed camping allows for use patterns that are intermittent and unpredictable. For example, Cuiti et al. (2012) found that elk vigilance was highest during times of the year when recreation disturbance was lowest (winter) and on private lands where recreation use was low compared to nearby national parks. They also found that elk vigilance was lowest during the busiest times of year in national parks (summer). Habituation to user presence reduced the level of vigilance in elk in this study. Reduced vigilance reduces the behavioral costs of not pursuing other activities such as foraging. Users may also knowingly, or unknowingly, select sites that are situated within or in close proximity to high value habitat, such as fresh water sources, productive understory vegetation, or nesting trees for species like bald eagles. Designated campsites can be strategically placed and managed to avoid high disturbance to high value habitat or know areas with special status species.

Steidl and Anthony (2000) found that breeding behavior of bald eagles changed when people were camping for 24 hours within 100 yards of an active nest. They found that the amount of time away from the nest increased by 27 percent and amount of prey consumed by nestlings decreased by 29 percent.

Pets

In addition to human disturbance, public lands users can have other unintended impacts on wildlife. Many hikers bring their dogs with them and do not always obey leash laws. Dogs may chase, harass, and, in some cases, kill wildlife. A study conducted by Length and Knight (2008) concluded that several wildlife species altered their utilization patterns in response to the presence of domestic dogs on and off nearby trails. Activity levels and the density of species were substantially higher near trails where domestic dogs were not allowed.

Accessing Nearshore Habitat (Including Boating)

While the BLM's jurisdiction only extends to mean high tide, activities within the Monument, can affect wildlife in shallow nearshore habitat as well as in nearshore habitat above mean high tide. Seabirds are very sensitive to disturbance during the nesting season and may abandon eggs or young if disturbed. Seabird colonies have failed simply from boaters anchoring too closely or humans walking through the

colony during breeding (U.S. FWS 2011). Human disturbance to nesting seabirds and shorebirds has been shown to reduce productivity and contribute to species decline (McGowen and Simons 2006, Carney and Sydeman 1999, Anderson and Keith 1980, Rhulen 2003). Disturbance to nests can cause adults to flush from the nest, leaving eggs vulnerable to predation or hatch failure (Garber 1972, Hunt 1972, Bart 1977). Yasue 2005 found that flock size and prey density decreased on shorebird foraging sites relative to human presence.

Seabirds restricted to using ocean or nearshore habitats, such as common loon, marbled murrelet, and rhinoceros auklet, may be less vulnerable to land based recreation; water based recreation has been shown to cause disturbance responses in these species (Acosta et al. 2008 and Bellefleur and Ronconi 2009). Birds that are approached by motorized or non-motorized boats often flush from their preferred resting or foraging habitat, resulting in increased energetic costs to nearshore birds. Evans (2009) found that common loons flushed 51 meters (167 feet) on average in response approach by 1-2 kayaks.

Birds that nest on land can also experience distress and alarm from human presence, especially during the nesting season. Mindfully avoiding any active nests or birds displaying nesting or brooding behaviors (e.g. birds sitting or calling from a nest, circling or diving away intruders) can minimize disturbance to terrestrial wildlife. A general setback guideline of 164 feet (50 meters) has been recommended to avoid disturbance to nesting seabirds (Chatwin et al 2013). The U.S. FWS National Bald Eagle Management Guidelines (2007) recommend limiting motorized and non-motorized watercraft activity, and human entry activity within 330 feet of active nests, particularly where eagles are unaccustomed to nearby activity.

Pinnipeds (seals, sea lions) are also highly vulnerable to human disturbance, but may react differently depending on their degree of previous experience, age, sex, location, and life cycle stage. Disturbance can vary from temporary alertness, interrupted nursing, or the separation of pups from mothers, leading to reduced fitness, decreased blubber production, and increased mortality. Adults also sometimes crush pups during post-disturbance stampeding into the water. Among the disturbances that affect pinnipeds, research has shown that approaching kayaks have a disproportional negative response, perhaps due to the kayak's stealthy, low profile approach or tendency to approach closer to the shore (Henry and Hammill 2011, Suryan and Harvey 1999). Land-based recreation can also cause seals and sea lions to be more vigilant or to prematurely leave preferred haul out areas (Andersen et al. 2011, Andersen et al. 2014).

Though these impacts have not been extensively documented or quantified, direct impacts to fish of boat landing in nearshore environments can include: a) disruption of salmonid juvenile rearing, refuge, feeding, and adult migration; b) disruption of juvenile stage rockfish use shallow surface waters, kelp, and eelgrass for refuge and forage; c) direct killing or injuring of species present in nearshore habitats (Whitfield and Becker 2014). Based on observation of direct impacts and discussion with professionals, this analysis assumes that these impacts to fishes would be rare and localized (Radmer 2017).

Direct impacts to fishes using deeper marine habitats from the landing of boats on Monument land are very unlikely, due to lack of proximity. While the BLM does not have jurisdiction to allow or prohibit anchoring or mooring in the waters adjacent to the Monument, the continued availability of Monument shorelines for recreational use may influence the amount of nearby anchoring or mooring activity, which could indirectly affect fish species in deeper marine habitats.

Effects Common to all Habitat Types

As discussed in the Overview of Disturbance from Visitation section, above, leashed and unleashed pets can have negative impacts on wildlife (Miller et al 2001). Under the No Action Alternative, there would continue to be no prohibition of pets within the Monument. Under existing supplemental rules, visitors would continue to be required to leash pets in developed recreation sites (BLM 2005). Outside of those sites, pets could continue to be off leash. Alternatives A and B would prohibit pets within the Monument (except service animals). Alternatives C and D would prohibit pets off-leash within the Monument (i.e., leashed pets would continue to be allowed). Disturbances to wildlife from pets in all habitat associations

would be lowest under alternatives A and B. The likelihood of disturbance or harm to wildlife due to free roaming pets would be greatest under the No Action Alternative.

Forest and Woodland Habitat Association

The alternatives would vary in the extent to which vegetation treatments and recreational opportunities would create the potential for wildlife disturbance in forest and woodland habitats. See the Overview of Disturbance from Vegetation Treatments section for a description of the types of wildlife disturbance that could occur through implementation-level vegetation treatments. See the Overview of Disturbance from Vegetation Treatments section for a description of the types of disturbance that could occur through visitors participating in the opportunities provided under each alternative.

No Action Alternative

Under the No Action Alternative, there would continue to be very little vegetation management (~20 acres per year) within the Monument. Human disturbance of wildlife would continue to be primarily limited to recreational use, administrative use, and other authorized uses such as scientific research and educational activities.

Other than Alternative D, there would be the greatest level of recreational use of forested Monument lands under the No Action Alternative (see Table 9 on page 84). Under the No Action Alternative, all Monument trails would continue to be open to all non-motorized uses. Disturbance to wildlife under this alternative would continue at the current rate. High trail use in the spring and summer would continue to potentially disrupt nesting migratory birds.

Under the No Action Alternative, recreational use would continue to affect other diurnal wildlife species. Smaller mammals, such as squirrels and voles, would continue to be flushed from cover more frequently than would be likely under alternatives A, B, and C and be more vulnerable to predation. Human disturbance would also continue to affect larger species, such as black-tailed deer.

Under the No Action Alternative, the BLM would continue allow dispersed camping without a permit on 421 acres of forested Monument land. While this use is currently very limited, the BLM would continue to have minimal control over the numbers of campers and the season and locations of this activity. There would be fewer acres open to dispersed camping under the No Action Alternative than Alternative B, but the continued lack of permit requirement under this alternative may allow for greater impacts. The impacts from camping in designated sites would be similar to alternatives B and C, but substantially less than under Alternative D.

In summary, the No Action Alternative would have the second largest disturbance impact on wildlife in forested habitat due to recreational use of trails, roads, and dispersed camping. However, disturbance due to vegetation management projects would be minimal. The BLM assumes that vegetation treatments would continue to be limited to vegetation removal using hand tools.

Alternative A

Alternative A would cause the least disturbance to forest and woodland wildlife out of all of the alternatives. The BLM would prohibit recreational use of the Monument and would undertake minimal vegetation treatments. Thus, disturbance would be limited to that caused by administrative use and authorized uses such as scientific research. Impacts such as reduced nesting success, increased energetic costs, and increased predation rates, would all be lowest under Alternative A.

Alternative B

Under Alternative B, the BLM would designate 14 miles of hiking trails and allow dispersed camping on 600 acres of forested Monument lands and at the existing designated campsites at Blind, Patos, and Posey islands. Disturbance to wildlife from human use would be substantially greater than under Alternative A, moderately greater than under Alternative C, and somewhat less than under the No Action Alternative and Alternative D.

While the BLM would use a permit system to limit the number of visitors engaged in dispersed camping under this alternative, there could be substantial impacts to forest wildlife from this activity. This alternative would allow dispersed camping on more acres of Monument forests and woodlands than any other alternative. Under Alternative B, the BLM would use a permitting system to limit the size of groups participating in dispersed camping.

Under Alternative B, the BLM would designate more trail miles in Monument forest and woodlands than would exist under the No Action Alternative and than it would designate under alternatives A and C. While trail use would be limited to hiking, there would likely be more disturbance from trail use under this alternative than under either the No Action Alternative or Alternative C.

Based on the vegetation treatment acres estimated under Habitat and Plants Issue 3, disturbance to forest wildlife due to vegetation treatments would be less than under Alternative C and Sub-Alternative C, but substantially more than the No Action Alternative and alternatives A and D (see Table 18 on page 112). Vegetation treatments would include mechanical vegetation removal, planting and seeding, herbicide application, and prescribed fire use. All of these activities would disturb wildlife in forested habitats (see the Overview of Disturbance from Vegetation Treatments section, above, for more detail on the types of disturbance).

Alternative C

Alternative C would have substantially greater impacts to forest and woodland associated wildlife from recreation-related disturbance than Alternative A, but more moderate impacts than the No Action Alterative and alternatives B and D. The BLM would designate a smaller mileage of trail miles for hiking than under alternatives B and D. There would also likely be less trail use than under the No Action Alternative. Two miles of trail would be open to equestrian use, which may cause greater visitation, and thus disturbance, along those trail miles.

Under Alternative C, impacts to wildlife from camping would be lower than under all alternatives other than Alternative A. The BLM would not allow dispersed camping in the Monument under this alternative. Impacts from designated camping would the same as under the No Action Alternative and Alternative B, but substantially less than under Alternative D. Of the alternatives that allow recreation, Alternative C would have the lowest recreation related disturbance to forest and woodland wildlife.

Based on the vegetation treatment acres estimated under Habitat and Plants Issue 3, disturbance to forest wildlife due to vegetation management projects would be slightly higher under Alternative C than under Alternative B, but lower than under Sub-Alternative C (See Table 19 on page 114). Disturbance effects from vegetation treatments would be substantially higher than under the No Action Alternative and alternatives A and D. Vegetation treatments would include mechanical vegetation removal, planting and seeding, herbicide application, and prescribed fire use. All of these activities would disturb wildlife in grasslands and shrubland habitats (see the Overview of Disturbance from Vegetation Treatments section, above, for more detail on the types of disturbance).

Sub-Alternative C

The primary difference between this alternative and Alternative C is that there would be substantially greater disturbance to forest and woodland associated wildlife from mechanical vegetation treatments (see Table 20 on page 115). Due to the prohibition on herbicides under this alternative, the BLM estimates that it would need to repeat treatments at a very high rate in order to meet habitat and plant communities objectives. This would cause the greatest disturbance to wildlife in forest and woodlands from vegetation treatments of any alternative.

Alternative D

Alternative D would have the greatest potential for disturbance to forest and woodland wildlife of any of the alternatives. While the BLM would allow dispersed camping on fewer forest and woodland acres than under Alternative B, it would continue not to require a permit for this activity. Impacts from

designated camping would increase substantially from the current condition by the addition of 137 acres of forest and woodland open to this use. Compared to the No Action Alternative, an additional 47 acres of forest and woodland would be open to dispersed camping without a permit.

Trail miles in Monument forest and woodlands would nearly double under this alternative compared with the current user created trail network that would persist under the No Action Alternative (from 9.2 miles to 17.2 miles). The BLM would allow equestrian and bicycle use on fewer trail miles than are currently open to these uses, but on more trail miles than alternatives A, B, and C.

Under Alternative D, the BLM would be likely to implement more vegetation treatments in forest and woodlands than under the No Action Alternative or Alternative A, but substantially fewer than under all other alternatives (see Table 21 on page 116). Disturbance effects from treatments would be similar to \ the No Action Alternative and Alternative A. The BLM would allow all types of vegetation treatments under this alternative, but estimates that it would use a small acreage of mechanical treatments, herbicides, and prescribed fire to accomplish the Alternative D habitat and plant communities objectives. All of these activities would disturb wildlife in grasslands and shrubland habitats (see the Overview of Disturbance from Vegetation Treatments section, above, for more detail on the types of disturbance).

Grasslands and Shrublands

The alternatives would vary in the extent to which vegetation treatments and recreational opportunities would create the potential for wildlife disturbance in grassland and shrubland habitats. See the Overview of Disturbance from Vegetation Treatments section for a description of the types of wildlife disturbance that could occur through implementation-level vegetation treatments. See the Overview of Disturbance from Vegetation Treatments section for a description of the types of disturbance that could occur through visitors participating in the opportunities provided under each alternative.

Disturbance from recreation may be more pronounced in open vegetation than in forested habitats. Compared to forests and wetlands, grasslands and shrublands offer less hiding cover and inaccessible habitat. In this setting, some wildlife species, such as black-tail deer and hawks can detect human activity from farther distances than they would be able to in forested habitat. Noise from human activity also travels farther, giving animals a greater advantage of seeing and responding to humans, but fewer places to hide in response.

No Action Alternative

The No Action Alternative would have a similar potential for disturbance from recreation to wildlife in grasslands and shrublands as Alternative D, and greater potential than under alternatives A, B, and C. Human activities like designated site camping, hiking, and equestrian use would continue under the No Action Alternative. Dispersed camping and bicycling trail use might remain at their current low level of participation but the BLM would continue to allow these activities and they could expand over time.

Acres of Monument grasslands and shrublands open to dispersed camping without a permit would be greatest in the No Action Alternative, though 19 additional acres would be open to dispersed camping with a permit in grasslands and shrublands under Alternative B. Impacts from existing designated site camping in grasslands and shrublands would continue and would be the same as under alternatives B and C, though substantially less than under Alternative D. Under the No Action Alternative, there would continue to be 5.1 miles of trail in Monument grasslands and shrublands, though this mileage could expand over time through new user created trails. This would be higher than under alternatives B and C and slightly lower than under Alternative D. These trails would continue to be open to all non-motorized uses.

There would continue to be little to no disturbance to wildlife in grasslands and shrublands from vegetation management projects under this alternative. The BLM assumes that vegetation treatments would continue to be limited to vegetation removal using hand tools.

Alternative A

Alternative A would cause the least disturbance to grassland and shrubland wildlife out of all of the alternatives. The BLM would prohibit recreational use of the Monument and would undertake minimal vegetation treatment. The BLM would prohibit prescribed fire and pesticide use under this alternative. Thus, disturbance would be limited to that caused by administrative use and authorized uses such as scientific research. Impacts such as reduced nesting success, increased energetic costs, and increased predation rates, would all be lowest under Alternative A.

Alternative B

Under Alternative B, the impact of recreation disturbance to wildlife in grasslands and shrublands would be less than under the No Action Alternative and Alternative D, but substantially greater than under Alternative A and somewhat greater than under Alternative C. Under Alternative B, the BLM would designate 4.4 miles of trails for hiking and 87 acres for dispersed camping by permit within existing Monument grasslands and shrublands. There would be no authorized equestrian or bicycle trail use under this alternative. This would imply greater disturbance from trail use in Monument grasslands and shrublands than under Alternative A and Alternative C and less disturbance in this habitat type than under the No Action Alternative and Alternative D.

This alternative would include the greatest acreage of Monument grasslands and shrublands open to dispersed camping; the BLM would also continue to allow camping in designated sites as under the No Action Alternative and Alternative C. This is the only alternative that would require permits for dispersed camping. As discussed in the Overview of Disturbance from Visitation section, the intermittent use of areas for dispersed camping may have a disproportionately negative effect on some wildlife species (MacArthur et al. 1982, Schultz and Bailey 1978, Miller at al. 2001). The BLM would limit dispersed camping to one group per location per night with no more than five participants; it could further use the permitting system to limit the timing, location, and duration of the activity in order to reduce or redistribute these impacts.

Based on the vegetation treatment acres estimated under Habitat and Plants Issue 3, disturbance to grasslands and shrubland wildlife due to vegetation treatments would likely be less than under Alternative C and Sub-Alternative C, but substantially more than the No Action Alternative and alternatives A and D (see Table 18 on page 112). Vegetation treatments would include mechanical vegetation removal, planting and seeding, herbicide application, and prescribed fire use. All of these activities would disturb wildlife in grasslands and shrubland habitats (see the Overview of Disturbance from Vegetation Treatments section, above, for more detail on the types of disturbance).

Alternative C

Other than Alternative A, Alternative C would have the least amount of disturbance to grassland and shrubland wildlife resulting from recreation. Trail miles within grasslands and shrubland would decrease to 2.9 miles; less than 0.1 miles of this trail would remain open for equestrian use. There would be no dispersed camping authorized on any acres of the Monument. Impacts from designated site camping would be the same as under the No Action Alternative and Alternative B, but substantially lower than under Alternative D.

Disturbance to grassland and shrubland wildlife due to vegetation management projects would be slightly higher under Alternative C than under Alternative B, but lower than under Sub-Alternative C. Disturbance effects from vegetation treatments would be substantially higher than under the No Action Alternative and alternatives A and D. Vegetation treatments would include mechanical vegetation removal, planting and seeding, herbicide application, and prescribed fire use. All of these activities would disturb wildlife in grasslands and shrubland habitats (see the Overview of Disturbance from Vegetation Treatments section, above, for more detail on the types of disturbance).

Sub-Alternative C

The primary difference between this alternative and Alternative C is that there would be substantially greater disturbance to grassland and shrubland wildlife from mechanical vegetation treatments. Due to the prohibition on herbicides under this alternative, the BLM estimates that it would need to repeat treatments at a very high rate in order to meet habitat and plant communities objectives. This would cause the greatest disturbance to wildlife in grasslands and shrublands from vegetation treatments of any alternative.

Alternative D

Alternative D would have a similar potential for recreation-related disturbance to grassland and shrubland wildlife to the No Action Alternative, and a greater potential for such impacts compared to alternatives A, B, and C. Trail miles within grassland and shrubland would increase to 5.6 miles, a 0.5 mile more than currently exist. Approximately 1 mile of trail in grassland and shrubland would continue to be open to equestrian and bicycle use. Because all trails are currently open to all non-motorized uses, there would be fewer trail miles on which the BLM would allow these modes of transportation than there are currently. However, the designation of trails explicitly for these uses could increase participation in these activities in the Monument.

Acres open to dispersed camping in Monument grasslands and shrublands would decrease by 41 acres under this alternative compared to the No Action Alternative. Potential disturbance to wildlife from designated site camping would increase substantially under this alternative as an additional 85 acres of grassland and shrubland would be open to this use. Designated site camping is more predictable than dispersed camping and it is likely that the latter form of camping could cause greater disturbance to wildlife in grasslands and shrublands.

Under Alternative D, the BLM would be likely to implement more vegetation treatments in grasslands and shrublands than under the No Action Alternative or Alternative A, but substantially fewer than under all other alternatives. Disturbance effects from treatments would be similar to the No Action Alternative and Alternative A. The BLM would allow all types of vegetation treatments under this alternative, but estimates that it would use a small acreage of mechanical treatments, herbicides, and prescribed fire to accomplish the Alternative D habitat and plant communities objectives. All of these activities would disturb wildlife in grasslands and shrubland habitats.

Nearshore Wildlife Association

The alternatives would vary in the extent to which nearshore stabilization and recreational opportunities would create the potential for wildlife disturbance in nearshore habitats. Specifically, the BLM assumes that the more miles of shoreline are open to recreational boat landing the greater the potential for nearshore fish and wildlife disturbance; similarly the BLM assumes that the more trails within 300 feet of the shoreline the more potential for disturbance to marine mammals and sea birds (see Table 70). Human and wildlife interactions are generalized with a basic assumption that fewer human-wildlife interactions would result in fewer negative impacts to wildlife. See the Overview of Disturbance from Visitation section for a discussion of impacts from these recreational activities.

Unlike other habitat types, the BLM is unlikely to implement vegetation treatments directly in nearshore habitats. Stabilizing shorelines, which the BLM would undertake only to protect vulnerable cultural or paleontological resources, would disturb some amounts of nearshore wildlife during construction.

Impacts from shoreline stabilization could include disruption or killing of fishes through the placement of stabilization materials. While impacts from shoreline stabilization to nearshore habitat would be long-term, disruption or killing of fish would only occur during the initial installation. The potential for direct impacts to fishes from installation of bank stabilization would be associated primarily with the amount of materials used; the BLM assumes that hard and soft stabilization would have similar potential to disrupt or kill nearshore fishes. Because the BLM would implement hard stabilization only where soft

stabilization would be ineffective, the BLM assumes that more stabilization, and thus more disruption to nearshore wildlife, would take place under alternatives where it allows both methods.

Table 70: Nearshore recreation-related disturbance indicators by alternative

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Miles of trail within 300 feet of a marine mammal haulout	3.9	0	4.4	3.2	6.1
Miles of trail within 300 feet of shoreline	10.2	0	11.0	7.3	14.3
Miles of shoreline continuing to be open to recreational use	21.2	0	17.3	18.5	21.2

No Action Alternative

Under the No Action Alternative, the BLM would continue to allow recreational boat landings on all 21.2 miles of Monument shoreline (see Table 70). Boat landings would continue to lead to rare, localized disturbance and occasional killing of fish utilizing nearshore habitats adjacent to Monument. The most likely individuals to be impacted would be fishes and lifeforms tied to nearshore habitat: eulachon, juvenile salmonids, and juvenile rockfishes.

Access to all Monument shoreline for recreational boat landing, would continue current disturbance levels of marine mammals and birds making use of nearshore habitat. Similarly, current potential for disturbance associated with designated site camping at Blind, Posey, and Patos Islands would continue. The BLM would also continue to allow dispersed camping on all Monument lands outside of the 503 acres included in the ACECs on the south end of Lopez Islands. If current trends continue, participation in dispersed camping would remain low. Under this alternative there would continue to be 10.2 miles of trail within 300 feet of the shoreline and 4 miles of trail located within 300 feet of documented marine mammal haulouts (see Table 70). Hikers are not currently required to remain on trail, although the majority do. The No Action Alternative would have less potential for disturbance from visitors hiking and camping in the Monument than the Alternative D, but more than all other alternatives.

There would continue to be the current level of disturbance to marine mammals and special status nearshore birds such as bald eagle, harlequin ducks, common loons, and rhinoceros auklet. Except for Alternative D, this alternative would have the greatest potential for disturbance to these species.

The BLM would continue to undertake shoreline stabilization on an as-needed basis to protect cultural resources. While the BLM has only undertaken a limited amount (<0.1 mile of shoreline) of soft stabilization in the past, there are no existing plan decisions prohibiting the use of hard shoreline stabilization. Where new stabilization projects occurred, the placement of materials could cause the disturbance and killing of fishes in nearshore habitats. The most likely individuals to be impacted would be fishes and lifeforms tied to nearshore habitat: eulachon, juvenile salmonids, and juvenile rockfishes.

Alternative A

Under Alternative A, the BLM would prohibit recreational boat landings along all 21.2 miles of Monument shoreline (see Table 70). While boat landing would continue in emergencies as well as for authorized and administrative purposes, this would dramatically reduce the rate of boat landing on Monument shoreline. Alternative A would have the least disturbance or killing of fishes from boat landing of any alternative. It would also have the least disturbance to nearshore birds and marine mammals using nearshore habitat of any alternative. Foraging and resting habitat for nearshore birds and marine mammals would improve due to the decline in disturbance.

Under this alternative, the BLM would only undertake soft stabilization to protect cultural resources. Where new stabilization projects occurred, the placement of materials could cause the disturbance and killing of fishes in nearshore habitats. The most likely individuals to be impacted would be fishes and

lifeforms tied to nearshore habitat: eulachon, juvenile salmonids, and juvenile rockfishes. Potential impacts from shoreline stabilization to fishes would be slightly less than under the No Action Alternative.

Alternative B

Under Alternative B, the BLM would continue to allow boat landings on 16.4 miles of Monument shoreline (see Table 70). The BLM would prohibit recreational use, including recreational boat landings, on all marine rocks and rock groupings and at Watmough Bay (see Appendix O for Category A Rocks, Category B Rocks, and Watmough Bay RMA frameworks). This would result in more boat-landing related disturbance or killing of fishes utilizing nearshore habitats than Alternative A, but less than other alternatives. Forage fishes would benefit from reduced impact in Watmough Bay, leading to improved salmonid foraging in nearshore areas.

Prohibiting recreational boat landing on 4.8 miles of Monument shoreline would minimize risk of disturbance to nearshore birds and marine mammals in those areas. Approximately 11 miles of trail would be located within 300 feet of the shoreline (0.8 miles more than currently exist) and 4.4 miles of trail would be located within 300 feet of documented marine mammal haulouts (0.4 miles more than currently exist) (see Table 70). Hikers would be required to remain on trail. The current potential for disturbance associated with designated site camping at Blind, Posey, and Patos Islands would continue. Alternative B would also allow dispersed camping by permit on 37 acres that are within 300 feet of designated marine mammal haulouts. Alternative B would have less potential for disturbance from visitors hiking and camping in the Monument than the No Action Alternative and Alternative D, but more than alternatives A and C.

Under this alternative, the BLM could undertake hard shoreline stabilization, in addition to soft stabilization, as needed to protect cultural resources. Where new stabilization projects occurred, the placement of materials could cause the disturbance and killing of fishes in nearshore habitats. The most likely individuals to be impacted would be fishes and lifeforms tied to nearshore habitat: eulachon, juvenile salmonids, and juvenile rockfishes. Potential impacts from shoreline stabilization to fishes would be the same as the No Action Alternative and slightly greater than under the other action alternatives because of the likelihood that more stabilization would take place over the life of the plan under alternatives that allow hard stabilization throughout the Monument.

Alternative C

Under Alternative C, the BLM would continue to allow recreational boat landings on 17.8 miles of Monument shoreline. The BLM would prohibit recreational use, including recreational boat landings, on smaller and/or more sensitive rocks and rock groupings; motorized boat landings would be prohibited at Watmough Bay (see Appendix O for Category B Rocks and Watmough Bay RMA frameworks). This would result in an intermediate level of disturbance or killing of fishes utilizing nearshore habitats. Fewer landings on smaller and/or more sensitive rocks could lead to reduced impact to fishes using deeper marine habitats, including rockfishes.

Prohibiting recreational boat landing on 3.4 miles of Monument shoreline would minimize risk of disturbance to nearshore birds and marine mammals in those areas (see Table 70). Approximately 7.3 miles of trail would be located within 300 feet of the shoreline (2.9 miles less than currently exist) and 3.2 miles of trail would be located within 300 feet of documented marine mammal haulouts (0.8 miles less than currently exist) (see Table 70). Hikers would be required to remain on trail. The current potential for disturbance associated with designated site camping at Blind, Posey, and Patos Islands would continue. The BLM would prohibit camping on all other Monument lands. Alternative C would have less potential for disturbance from visitors hiking and camping in the Monument than the No Action Alternative and alternatives B and D, but more than Alternative A.

Under this alternative, the BLM would only undertake soft stabilization to protect cultural or paleontological resources. Where new stabilization projects occurred, the placement of materials could cause the disturbance and killing of fishes in nearshore habitats. The most likely individuals to be

impacted would be fishes and lifeforms tied to nearshore habitat: eulachon, juvenile salmonids, and juvenile rockfishes. Potential impacts from shoreline stabilization to fishes would be slightly less than under the No Action Alternative and alternatives B and D.

Alternative D

Under Alternative D, the BLM would continue to allow recreational boat landings on all 21.2 miles of Monument shoreline; the BLM would also increase acres open to designated site camping for visitors arriving by non-motorized boat (see Table 70). The development of new campsites during plan implementation would lead to the increase of landings at these locations. This would lead to a slightly increased level of boat landing-related disturbance and occasional killing of fish compared to the No Action Alternative.

Potential for disturbance to marine mammals and nearshore birds would occur on all miles of the Monument shoreline. Approximately 14.3 miles of trail would be located within 300 feet of the shoreline (4.1 miles more than currently exist) and 6.1 miles of trail would be located within 300 feet of documented marine mammal haulouts (2.1 miles more than currently exist) (see Table 70). The current potential for disturbance associated with designated site camping at Blind, Posey, and Patos Islands would continue. Designated site camping would be allowed on an additional 117 acres within 30 feet of a documented marine mammal haulout. The BLM would identify new designated sites through implementation-level planning and NEPA compliance; it would not allow camping in these areas until sites are designated and analyzed for potential impacts to wildlife. Implementation-level planning would provide design features on a site-specific basis to avoid or minimize negative impacts associated with camping. Alternative D would also allow dispersed camping on 19 acres that are within 300 feet of designated marine mammal haulouts. If necessary seasonal closures or restrictions may be undertaken if human presence is observed to have negative impacts to wildlife. Alternative D would have the greatest potential for disturbance to marine mammals and nearshore birds of any alternative.

Under Alternative D, the BLM could undertake hard stabilization of shorelines, in addition to soft stabilization, as needed to protect cultural or paleontological resources outside of areas managed for their wilderness characteristics (see Wilderness Characteristics on page 231 for more information). Where new stabilization projects occurred, the placement of materials could cause the disturbance and killing of fishes in nearshore habitats. The most likely individuals to be impacted would be fishes and lifeforms tied to nearshore habitat: eulachon, juvenile salmonids, and juvenile rockfishes. Based on hard stabilization being allowed in only part of the Monument, the BLM assumes that these impacts would be less than under the No Action Alternative and Alternative B and more than under alternatives A and C.

Wetland Habitat Association

The alternatives would vary in the extent to which vegetation treatments and recreational opportunities would create the potential for wildlife disturbance in wetland habitats. See the Overview of Disturbance from Vegetation Treatments section for a description of the types of wildlife disturbance that could occur through implementation-level vegetation treatments. See the Overview of Disturbance from Vegetation Treatments section for a description of the types of disturbance that could occur through visitors participating in the opportunities provided under each alternative.

Wetland habitat is typically inaccessible to most recreationists. Wet soils and dense vegetation make off-trail use around wetlands difficult, thus deterring or preventing entrance by humans into most wetlands. Disturbance by human activity would be primarily limited to the margins of wetland habitats. Waterfowl and other migratory bird species could be flushed by Monument visitors that approach on trails in close proximity to wetlands. This could interrupt nesting behaviors resulting in decreased reproductive success, increased likelihood of nest predation or parasitism. Deer and other mammals may limit their use of wetland habitat during the busiest portions of the recreation season. Displacement from preferred habitat may occur, or the time of use may change (Ciuti et al. 2012). Animals may use wetlands as a water source during evening or night hours in order to avoid detection by humans.

No Action Alternative

If current management of the Monument continues, the BLM would expect recreation levels near wetland habitat to continue. There would continue to be 0.3 miles within 25 feet of a wetland and 0.9 miles of trail within 150 feet of a wetland, though these trail miles could expand through continued proliferation of user created trails.

All trail miles would continue to be open to all non-motorized uses, though non-hiking uses are likely to continue to be limited. The 0.1-mile road to the Watmough Bay trailhead, which is partially within 150 feet of Watmough Marsh, would remain open to all non-motorized uses in addition to public motorized use. Most research indicates that disturbance response for many wildlife species is greatest when wildlife are exposed to humans walking versus a vehicle or boat (Rodgers and Smith 1995, Miller et al 2001).

Under the No Action Alternative, there would continue to be little to no disturbance of wetland wildlife from vegetation treatments management within the Monument.

Alternative A

Disturbance to wetland wildlife would be lowest under Alternative A. There would be no recreation allowed within the Monument under this alternative. Thus, human disturbance to wetland species would be limited to administrative use by Monument staff and authorized use for scientific, educational, cultural, and spiritual reasons.

As under the No Action Alternative, under Alternative A there would continue to be little to no disturbance of wetland wildlife from vegetation treatments management within the Monument.

Alternative B

Under Alternative B, the BLM would designate 0.4 miles of trail within 25 feet of a wetland and 1.2 miles of trail within 150 feet of a wetland; this would be slightly higher than under the No Action Alternative and Alternative C and substantially higher than under Alternative A. They would be the same trails as those under Alternative D.

Unlike Alternative D, these trails would only be open to hiking under Alternative B. The 0.1-mile road to the Watmough Bay trailhead, which is partially within 150 feet of Watmough Marsh, would remain open to all non-motorized uses in addition to public motorized use.

Disturbance impacts to wetland wildlife from implementation of wetland restoration and expansion projects would be substantial under Alternative B. Human activity, machinery noise, and disturbance to areas that are typically undisturbed would displace some wildlife, forcing them find other freshwater resources, which are limited on Lopez Island (the only Monument lands with wetlands are on Lopez Island). These effects would be temporary, however, and the BLM would expect normal wildlife use to resume once project implementation and habitat recovery were complete.

Alternative C

Under Alternative C, the BLM would designate the existing 0.3 miles of trail within 25 feet of a wetland and 0.9 miles within 15 feet of a wetland. Unlike the No Action Alternative, visitors would be required to stay on trails except for authorized purposes. The effects of disturbance from trail use to wetland wildlife under Alternative C would be very similar to the No Action Alternative. There would be a slightly lower potential for disturbance to wildlife from trail use under this alternative compared to alternatives B and D.

The BLM would continue to allow equestrian use on 0.1 miles of trail within 25 feet of a wetland and 0.5 miles of trail within 150 feet of a wetland, in addition to continued equestrian and bicycle access on the 0.1-mile road to the Watmough Bay trailhead. While equestrian use does not inherently indicate a greater potential for disturbance, the explicit designation of these trails for that use may attract additional visitors. The potential for disturbance would increase if trail use increased over the life of the plan.

Under Alternative C, the BLM would manage existing wetlands to control invasive species and improve hydrology (e.g., by removing encroaching trees). While wetland projects would affect fewer acres than

under Alternative B, there would still be substantial disturbance to wetland wildlife during the restoration efforts proposed. These disturbance effects would be similar to those described in Alternative B.

Alternative D

Under Alternative D, the BLM would designate 0.4 miles and 1.2 miles of trail respectively within 25 and 150 feet of wetlands. This would be slightly higher than under the No Action Alternative and Alternative C and substantially higher than under Alternative A. They would be the same trails as those under Alternative B.

Unlike Alternative B, nearly all of these trails would be open to equestrian and bicycle use. The 0.1-mile road to the Watmough Bay trailhead, which is partially within 150 feet of Watmough Marsh, would also remain open to all non-motorized uses in addition to public motorized use. While equestrian and bicycle use do not inherently indicate a greater potential for disturbance to wetland wildlife, the explicit designation of these trails for these uses may attract additional visitors. The potential for disturbance would increase if trail use increased over the life of the plan.

Under Alternative D, the BLM would manage wetlands only to maintain current conditions. This would require slightly greater disturbance from vegetation treatments than under the No Action Alternative and Alternative A, but much less disturbance than under alternatives B and C.

Conclusion

Table 71 summarizes the relative impacts of human disturbance under each alternative on the various wildlife habitat associations. Potential impacts to wildlife include avoidance, displacement, decreased reproductive success, and energetic costs. In general, Alternative A would result in the lowest human disturbance to wildlife. The BLM would prohibit recreational use and undertake minimal vegetation treatments. Total human presence within the Monument would be lowest under Alternative A. With its lack of vegetation treatments and prohibition on recreational use, Alternative A would have the least impacts on wildlife from disturbance.

Conversely, Alternative D would increase some recreational opportunities compared to the No Action Alternative, which would result in more human disturbance in the Monument during high use seasons. There would be substantially more acres open to designated camping and a slightly higher acreage (535 acres compared to 516 acres) open to dispersed camping compared to the No Action Alternative. However, under Alternative D, the BLM would not implement the extensive vegetation treatments proposed in alternatives B and C, which would minimize project related disturbance to wildlife.

Under the No Action Alternative, disturbance from recreation and minimal vegetation treatments would continue at their current level. Acres available to dispersed camping would be similar to Alternative D but there would be far more areas open to designated camping under Alternative D. Under Alternative D, the level of disturbance to wildlife resulting from recreation would be the greatest of any alternative and would be least desirable in regards to wildlife exposure to disturbance.

The likelihood of direct impact to individual fishes under any of the alternatives would not be high. It is possible that implementation of some alternatives could lead to a temporary change in fish behavior for individual fishes using nearshore habitats, and perhaps very minor loss of individual nearshore fishes. It is very unlikely that any of the alternatives would lead to measurable changes in population or run sizes in any fish species in or adjacent to the Monument at any spatial scale.

Table 71: Summary of effects from disturbance due to vegetation treatments and recreational activities to wildlife under each alternative

Wildlife and Habitat Association	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Terrestrial	Moderate impacts to wildlife	Least impacts to wildlife	Moderate impacts to wildlife	Moderate impacts to wildlife	Greatest impacts to wildlife
Nearshore	Moderate impacts to nearshore wildlife	Least impacts	Moderate impacts to nearshore wildlife	Low impacts to nearshore wildlife	Most impacts to nearshore wildlife

Cumulative Effects of the Alternatives on Disturbance to Wildlife

Recreational activities with the potential to disturb wildlife (e.g., kayaking, hiking, camping, etc.) take place throughout the San Juan Islands on both private and public lands and waters. The intensity of visitor use varies by season and the accessibility of a given area. The Monument encompasses only 4 percent of the public land in the San Juan Islands; nearly 96 percent of the land accessed by visitors is outside of the Monument. All waters accessed by visitors for boating and other aquatic activities are outside of the Monument. Decisions made in this RMP are unlikely to have a notable effect on the level of outdoor recreation taking place in the San Juan Islands.

Because the acres of habitat that would be disturbed from recreation or vegetation management are small compared to the habitat available to wildlife in the San Juan Islands, the BLM does not expect substantial contributions to cumulative impacts from disturbance on wildlife species from any of the alternatives. While Alternative D would increase some recreational opportunities and alternatives B and C would result in large amounts of disturbance due to vegetation treatments, none of the alternatives would result in the need to federally list any species that are currently candidates for listing or are State or BLM special status species.

See Wildlife Issue 1 for more detailed analysis of the cumulative effects of the alternatives on wildlife in the San Juan Islands.

Wildlife Analytical Issue 3: *How would the alternatives address the primary threats to island marble butterflies identified in the U.S. FWS' 12 month finding for the species?*

See Appendix B for analytical methods used in this analysis.

Background

The U.S. FWS (2016) has identified the following threats to the island marble butterfly throughout the entirety of its range: (1) Habitat loss attributable to plant succession and competition with invasive species, herbivory by deer and European rabbits, and storm surges; (2) direct predation by spiders and wasps, and incidental predation by deer; (3) small population size and vulnerability to stochastic events; and (4) the cumulative effects of small population size and restricted range combined with any other stressor that removes individuals from the population or decreases the island marble butterfly's reproductive success.

The U.S. FWS announced a proposed rule to list the island marble butterfly, which is currently a candidate species, as an endangered species and designate critical habitat under the ESA (U.S. FWS 2018). Critical habitat would include the Monument land at Cattle Point (approximately 23 acres).

Affected Environment

The only known extant population of the rare island marble butterfly occurs primarily on National Park Service lands adjacent to Monument land at Cattle Point (San Juan Island) with some minor occurrences

documented on State, county, and private lands. The BLM has the potential to contribute to the recovery of this species by providing suitable habitat for its expansion and/or reintroduction. Expansion or reintroduction of the species onto Monument land would primarily address the threat of habitat loss by providing suitable habitat to aid in the recovery of the species. The BLM assumes that improvements in habitat quality and quantity, and the potential expansion of the population, would assist in reducing the cumulative effects of small population size.

Grassland habitat is of particular importance for the island marble butterfly; the Habitat and Vegetative Communities section includes a description of the current condition and trends for grasslands and shrublands on the Monument. Before its rediscovery on San Juan Island in 1998, the island marble was thought extinct for 90 years. Since 1998, the island marble butterfly has been documented in a few locations on San Juan Island and nearby Lopez Island (Schultz et al 2011, U.S. FWS 2014, U.S FWS 2018), but only one population remains today. This population is located adjacent to the Monument on land managed by the National Park Service. The majority of Monument land known to be suitable for the island marble butterfly is at Cattle Point on San Juan Island (though this habitat would currently be limited to patrolling, mate finding, and nectaring, unless host plants become established); however, suitable habitat may occur on other Monument lands on Lopez Island. The Monument land at Cattle Point encompasses approximately 23 acres.

The life cycle of the island marble butterfly is closely associated with its host plants (tumble and field mustard and Puget Sound peppergrass). The host plant on which the butterfly lays its eggs provides food for larvae in their early stages of development. The butterfly's lifecycle begins in early April shortly after the emergence of leaves and flowering stalks on the host plants at which time adults begin to emerge from pupae. Adults live for 6-9 days, during which they mate and lay eggs. Eggs hatch in May and by June larvae start searching for pupation sites where they wait until the following spring to emerge as adults (Lambert 2005).

The larval form of the island marble butterfly currently uses three species of host plants in the wild. Of these three host plants, only Puget Sound peppergrass (*Lepidium virginicum menziesii*) is native to the area. Records indicate that peppergrass was once present at Cattle Point (1974), but no recent surveys have documented its presence. The other two host plants (tumble mustard [*Sisymbrium altissimum*] and field mustard [*Brassica campestris*]) are non-native species (U.S. FWS 2016). Currently, there are no known parts of the Monument, at Cattle Point or elsewhere, with established host plant populations. They are, however, likely present in the seed bank at Cattle Point. While the BLM generally works to control or eliminate non-native species in native-dominated habitat, the dependence of the island marble on non-native mustards will require the BLM to consider the impact of such control on the butterfly. As a BLM sensitive species, during implementation the BLM will design projects to maximize potential benefits to species to avoid the need to list the species.

Effects of the Alternatives

No Action Alternative and Alternative A

Under these alternatives, potential future habitat for the island marble butterfly would continue to decrease within the Monument, primarily from encroachment from undesirable or invasive herbaceous species or trees, by an estimated 17 acres (see Table 7 on page 75). Because suitable habitat would decrease, these two alternatives would not address the island marble butterfly's "small population size and vulnerability to stochastic events."

Under the No Action Alternative and Alternative A, the BLM estimates that Monument grasslands and shrublands would decrease by approximately 13.5 percent over the next 20 years due to continued encroachment by forest species. This would reduce the potential Monument habitat available for expansion of the island marble butterfly population. Under these alternatives, the BLM would not treat grasslands to prevent this decline in acreage due to succession. Forest species and woody shrubs would continue to invade remaining grassland habitat, reducing its suitability for the butterfly.

Under both the continuation of the current custodial management approach and Alternative A's minimalist approach to management, the BLM would be unlikely to work with other agencies to reduce or eliminate non-native wildlife species, such as European rabbits, that may reduce the suitability of potential butterfly habitat through herbivory. While the island marble butterfly is not currently found within the Monument, in the event that they do re-occupy Monument habitat over the next 20 years, it is unlikely that the BLM would use actively manage grasslands to address predation by wasps and spiders, or incidental predation by deer.

These alternatives would be the least likely to meet the intent of the BLM's special status species policy, in that they would be unlikely to support the avoidance of the listing, or the eventual delisting, of the island marble butterfly under the ESA.

Alternative B

Under Alternative B, potential habitat for island marble butterfly would increase substantially compared to current conditions (from 126 acres to 520 acres). Approximately 50 percent of the Monument would be categorized as grassland and shrubland under Alternative B's objectives. Vegetation management would strive to enhance existing grasslands and the overall effect would be to improve and expand suitable habitat for the butterfly. The BLM would likely work with agencies to augment, translocate, or reintroduce butterflies on Monument lands and could partner with other agencies to reduce populations of non-native wildlife that negatively affect the Monument's ecological values, including potentially European rabbits.

Under Alternative B, habitat for the island marble butterfly would increase in acreage and in suitability. The BLM would work with the U.S. Fish and Wildlife Service on vegetation management projects to enhance habitat conditions for federally listed or candidate wildlife species that are primarily using non-native host plants, such as the island marble butterfly. Under this alternative, the BLM could maintain or establish non-native host plants for the butterfly (this would not include noxious weed species designated by Washington State for mandatory eradication or control). The BLM could also work with other agencies to address increases in non-native wildlife populations if monitoring demonstrates that they are damaging the Monument's ecological values, which could reduce herbivory of important habitat, as well as incidental predation.

This alternative would best meet the intent of the BLM's special status species policy, in that it would be most likely to result in the species not being listed, or eventually being delisted, under the ESA.

Alternative C

The effects of Alternative C on island marble butterfly would be similar to under Alternative B, except that the BLM would not establish or enhance populations of non-native host plants. The total potential habitat for island marble butterfly would be slightly smaller under this alternative than Alternative B (487 acres compared to 520 acres), but much larger than under the No Action Alternative (109 acres) and alternatives A (109 acres) and D (126 acres). However, potential habitat would not include habitat for larval island marble butterfly, unless non-native host species become established incidentally or through the re-introduction of native Puget Sound peppergrass. As a result, benefits to the butterfly would be low under this alternative.

This alternative would restore native grassland habitat, which could provide the non-larval island marble butterflies some additional habitat suitable for patrolling, mate finding, and nectaring. However, habitat for the larval form, which is the primary limiting factor for the butterfly, may not increase or have limited suitability. Of three known larval stage host plants, two are non-native and thus would not be managed for in this alternative, though they would likely continue to persist in the seed bank in some locations. The lone native host plant, Puget Sound peppergrass, is believed to be extirpated from Cattle Point and surrounding islands. The extent to which Puget Sound peppergrass could be re-introduced is not known at this time.

The partial closure of 612 acres of the Monument to the discharge of firearms under this alternative would reduce the number of deer removed from the landscape through hunting. Hunting with the discharge of firearms would continue to be allowed throughout the Monument for half of hunting season. As a result, the reduction in the number of deer removed would be less than under Sub-Alternative C. Any substantial increase in deer in or near butterfly habitat would potentially increase incidental predation of butterflies and decrease the quality of habitat available (U.S. FWS 2018). The BLM could work with other agencies to address increases in non-native wildlife populations if monitoring demonstrates that they are damaging the Monument's ecological values, which could reduce herbivory of important habitat, as well as incidental predation.

Sub-Alternative C

The primary difference between Alternative C and Sub-Alternative C is the prohibition of firearms and pesticide use for control of encroaching forest species and woody shrubs in grasslands. The overall benefit to the island marble butterfly would be negligible under this alternative, even less than under Alternative C. This is because it is unlikely that the BLM would achieve historic conditions and successfully control invasive and unwanted plants without the application of herbicides.

The closure of the Monument to the discharge of firearms under this alternative would reduce the number of deer removed from the landscape through hunting. Any substantial increase in deer in or near butterfly habitat would potentially increase incidental predation of butterflies and decrease the quality of habitat available (U.S. FWS 2018).

Alternative D

There would be no increase or decrease in Monument acres of potential island marble butterfly habitat under Alternative D. However, the suitability of existing acres for non-larval island marble butterflies for patrolling, mate finding, and nectaring could increase if non-native plants (other than those used by the butterfly) are treated. The BLM estimates that it would do less vegetation treatment for invasive plants under this alternative than alternatives B and C, but more than under the No Action Alternative and Alternative A. In addition, the BLM could work with other agencies to address increases in non-native wildlife populations if monitoring demonstrates that they are damaging the Monument's ecological values, which could reduce herbivory of important habitat, as well as incidental predation.

This alternative would maintain the current condition of existing grasslands, which could provide the non-larval island marble butterflies some habitat suitable for patrolling, mate finding, and nectaring. However, habitat for the larval form, which is the primary limiting factor for the butterfly, may not increase or have limited suitability.

Conclusion

Alternatives B would result in the greatest benefit to the island marble butterfly. Restoration effort within existing grasslands, coupled with work to establish host plants, would improve and increase suitable habitat for this species within the Monument. This alternative would best meet the intent of the BLM's special status species policy, in that it would be the alternative most likely to result in the species not being listed, or eventually being delisted, under the ESA.

Alternative C would expand and improve habitat for non-larval island marble butterflies, but would only support larval butterflies if non-native host plants are established incidentally or native pepper grass is reintroduced. The No Action Alternative and Alternative A would have the greatest negative impacts on potential habitat for the butterfly. Over the life of the plan, the BLM estimates that colonization of trees into existing grasslands would result in 17 fewer acres of potential habitat available to the island marble butterfly. Under Alternative D, the BLM would maintain the current condition and extent of grasslands and so the extent and suitability of potential island marble butterfly habitat would not change.

Cumulative Effects of the Changes to Habitat Quantity and Quality on the Primary Threats to Island Marble Butterfly

Throughout the Puget Lowland Ecoregion, which includes the San Juan Islands, both native and non-native grassland habitat covers an estimated 9 percent of the pre-Euro-American settlement extent of native grassland (Chappell et al. 2000). The Monument currently includes only 1.3 percent of the grasslands and shrubland vegetation within the San Juan Islands. This analysis assumes that all grassland and shrubland plant communities within the San Juan Islands are potential habitat for the island marble butterfly. Under all alternatives, the Monument includes only a small percent of this potential habitat. However, the close proximity of existing island marble butterfly populations to Monument grassland at Cattle Point (approximately 23 acres) make it potentially important habitat for expanding the butterfly population. The protected status of the Monument and its administration by a Federal agency also make it important to the potential expansion of the island marble butterfly throughout the San Juan Islands.

The contribution of the Monument to potential island marble butterfly habitat varies by alternative. Alternative B would result in the greatest benefit to the island marble butterfly. Restoration effort within existing grasslands, coupled with work to establish host plants, would improve and increase suitable habitat for this species within the Monument. This alternative would best meet the intent of the BLM's special status species policy, in that it would be the alternative most likely to result in the species not being listed, or eventually being delisted, under the ESA. Under the No Action Alternative and Alternative A, the decreasing acreage of Monument grasslands and shrublands would cause the overall acreage of potential habitat in the San Juan Islands to decrease by less than 0.1 percent (a decrease of 17 acres). Under alternatives B and C, the overall potential habitat in the San Juan Islands would increase by 3.7 percent (an increase of 394 acres) and 3.4 percent (an increase of 361 acres) respectively, though, as noted above, only under Alternative B would the BLM establish populations of non-native host plants. There would be no change in the overall potential habitat in the San Juan Islands under Alternative D.

On June 5, 2012, the National Park Service published a notice of intent to prepare a Prairie Stewardship Plan and Environmental Impact Statement for the San Juan Island National Historical Park (National Park Service 2012). This plan would address island marble butterfly habitat near Monument land at Cattle Point on San Juan Island. Island marble butterfly currently occupy this nearby National Park Service land. It is reasonably foreseeable that some form of restoration will be carried out on this nearby land over the next 20 years. Management of Monument land in the grassland and shrubland class would likely be most consistent with this restoration effort under alternatives B and C. The limited management of invasive plant species under the No Action Alternative and Alternative A may hinder the effectiveness of this restoration effort due to limited management of invasive plants and non-native wildlife populations.

Wildlife Analytical Issue 4: *How would variations in the control of wildlife of management concern (i.e., potentially harmful wildlife) and opportunities for hunting using firearms impact wildlife habitat?*

See Appendix B for analytical methods used in this analysis.

Affected Environment

There are native, introduced, and domesticated and/or feral wildlife species within the San Juan Islands that may pose a threat to the diversity of habitats and wildlife for which the Monument was partially designated. For example, due to lack of predation and hunting pressure, black-tailed deer populations within the San Juan Islands have expanded and are influencing vegetative cover and wildlife habitat. Arcese et al (2014) found that the cover, richness, and diversity of native and culturally important shrubs were 52–85 percent lower at sites in the Salish Sea region with abundant deer. Martin et al (2011) found that islands in the San Juan archipelago with no deer have the more abundant and diverse bird populations than those with high deer densities. Another study, undertaken on a Canadian island near the San Juan Islands, suggests that herbivore browsing can have a greater influence on grassland native plant species

than competition from non-native plants (Gonzales and Arcese 2008). Similar issues may arise in the Monument with Canada goose, non-native European rabbits, or other species. While the BLM does not have jurisdictional authority to manage these species directly, the BLM could collaborate with the WDFW, U.S. FWS, or APHIS to aid in regional planning efforts for wildlife of management concern. There is currently no management of potentially harmful wildlife within the Monument.

The WDFW and tribes manage hunting, which includes both bow and firearm seasons. While participation numbers are unknown, the BLM is aware that hunters participate in the hunting seasons on Monument land. The BLM is aware of hunting occurring on approximately 590 acres of Monument land. The BLM and partners have observed hunting (with or without firearms) on Lopez Island at the contiguous Chadwick Hill, Point Colville, and Watmough Bay and Iceberg Point. Hunting has also occasionally been observed on Cattle Point (on San Juan Island) and at Turn Point (on Stuart Island). Based on BLM and partner observations, hunting for deer is the primary hunting activity, though there have been rare instances of waterfowl hunting at Chadwick Marsh on Lopez Island. Other species that could be harvested within the Monument include California quail, wild turkey, and ring-necked pheasant, all three of which are introduced species to the San Juan Islands.

Residents of Lopez Island have raised safety concerns about conflicts between deer hunting using firearms and visitors participating in hiking and volunteer activities (BLM 2015b,c, BLM 2016a,b). The BLM has also received comments from members of the public and partner agencies asking that hunting opportunities be maintained (BLM 2015b,c, BLM 2016a,b). Monument lands are one of two areas where hunting is allowed on publically accessible lands on Lopez Island.

Effects of the Alternatives

No Action Alternative

Under the No Action Alternative, there would continue to be opportunities to hunt with a firearm on Monument lands outside of developed recreation areas (e.g., parking lots, areas with picnic tables and designated campsites, etc.). As under all alternatives, opportunities for non-firearm-based hunting (e.g., bow hunting) would also continue. It is not possible to predict what level of harvest might take place over the next 20 years, but overall trends in participation in hunting with a firearm in Washington State are declining (U.S. FWS and U.S. Census Bureau 2011). If hunting use on the Monument did not change from current levels, populations for black-tail deer would be unlikely to decrease substantially.

Assuming continuation of current management, the BLM would not work directly with agencies to control or eradicate species that are adversely affecting Monument objects and values (e.g., wildlife over-consuming native plant communities). Potentially harmful impacts include herbivory by European rabbits degrading potential habitat for the island marble butterfly and predation by eastern red foxes (which occur only on San Juan Island) on native wildlife such as ground nesting birds and the Shaw Island Townsend's vole.

Alternative A

Under Alternative A, all Monument acres would continue to be open to firearms discharge. However, since no recreation would be allowed under Alternative A, there would be limited access to Monument lands for hunting. The BLM assumes that this would cause a reduction in harvest levels for black-tail deer populations. Assuming current deer harvest on the Monument is influencing the deer population, this reduction in harvest could lead to an increase in impacts from deer on habitat and wildlife both within the Monument and on nearby public and private land.

Under Alternative A, as under the No Action Alternative, there would remain no direction for the BLM to work with agencies to control or eradicate species that are adversely affecting Monument objects and values. There would be no opportunity to address any adverse impacts from wildlife species identified during plan implementation. See the No Action Alternative for examples of potential adverse impacts.

Alternative B

Under Alternative B, the use of firearms for hunting would continue to be allowed across the Monument. As a result, in regards to impacts to habitat from changes to deer populations, Alternative B would have similar impacts to the No Action Alternative and Alternative D.

Under Alternative B, the BLM would work with wildlife agencies to control or eradicate wildlife species that are affecting Monument objects and values. This may include coordinating with APHIS, WDFW, and/or other agencies to control or eradicate potentially harmful wildlife.

This alternative would allow for implementation of measures to reduce the impacts of species such as European rabbits and eastern red foxes, both non-native game species, on wildlife and habitats within the Monument. Reductions in European rabbit would lesson herbivory on native grasses and forbs, which would benefit potential habitat for important native wildlife, including the island marble butterfly. Similarly, reducing introduced eastern red foxes would help restore a more historically natural predator to prey relationship on San Juan Island. Less predation by foxes would increase survival and reproduction of native prey species like the BLM sensitive Shaw Island Townsend's vole, as well as reduce parent or egg consumption of ground nesting or near-ground birds. Restoration of grasslands impacted by European rabbits would also make habitat more suitable for the Taylor's checkerspot butterfly, and other grassland wildlife like the short-eared owl, streaked horned lark, and Shaw Island Townsend's vole.

Alternative C

Under Alternative C, discharge of firearms would be allowed on portions of the Monument during approximately half of regular deer hunting seasons. This would allow for some continued harvest of game species, such as black tailed deer, using firearms. As under all alternatives, tribal hunting and non-firearm-based hunting (e.g., bow hunting) would continue. Given that there would be restrictions that would affect hunting that do not currently exist, the BLM assumes there would be some reduction in the current rate of harvest under this alternative. Assuming that current harvest is having an effect on the black tail deer population, this would lead to a slight increase in local black-tailed deer numbers and a commensurate increase in impacts to habitat and wildlife.

Under Alternative C, as under Alternative B and D, the BLM would work with wildlife agencies to control or eradicate wildlife species that are negatively affecting Monument objects and values. The effects would be the same as those described under Alternative B.

Sub-Alternative C

Under Sub-Alternative C, the Monument would be closed to discharge of firearms (it is otherwise identical to Alternative C for the purposes of this issue). As under all alternatives, tribal hunting and non-firearm-based hunting (e.g., bow hunting) would continue. Prohibiting the use of firearms would reduce hunter harvest rates of black-tailed deer. Assuming that current harvest is having an effect on the black tail deer population, this would lead to a slight increase in local black-tailed deer numbers and a commensurate increase in impacts to habitat and wildlife.

Alternative D

In regards to hunting with firearms, Alternative D would have similar impacts to the No Action Alternative and Alternative B. All acreage would continue to be open to firearms discharge.

Under Alternative D, as with Alternative B and C, the BLM would work with wildlife agencies to control or eradicate wildlife species that are negatively affecting Monument objects and values. The effects would be the same as those described under Alternative B.

Conclusion

Because of restrictions on access or discharge of firearms closures, alternatives A, C, and Sub-C would reduce the level of hunting within the Monument. This would reduce the rate of harvest of game animal

populations and could result in an increase in local deer populations in and around Monument lands where hunting is currently taking place (see affected environment).

Under the No Action Alternative, Alternative B, and Alternative D, which would not have firearms closures, the BLM assumes that current harvest rates would continue. Current harvest rates on Monument lands are unknown but are unlikely to be substantial enough to have population-level effects. However, local deer numbers could potentially decline if harvest levels were to increase. It is possible that local deer populations would be reduced enough to have indirect impacts on habitat by reducing herbivory.

Lastly, alternatives B, C, and D would direct the BLM to work with wildlife agencies to control or eradicate wildlife species that are negatively affecting Monument objects and values. Under all alternatives, the specifics of any of projects to control species, including species addressed and modes of control, would be determined during implementation and would be subject to public comment and review. Native species, such as Columbia black-tail deer, in addition to non-native species, could be controlled under these alternatives if they are adversely affecting Monument objects and values.

Cumulative Effects of the alternatives on control of wildlife of management concern and access to firearm-based hunting opportunities impact wildlife and wildlife habitat

In the San Juan Islands as a whole, hunting on publically accessible lands is extremely limited (see Table 36 on page 153). Publically accessible lands available to hunting in the San Juan Islands are described on page 177. On Lopez Island, there is one area of non-Monument public land that currently allows hunting.

Under Alternative A and Sub-Alternative C, limitations on access and discharge of firearms within the Monument would reduce the level of harvest of deer from public lands compared to what is currently taking place. Given the scarcity of public lands open to hunting in the San Juan Islands, hunters using firearms would have few alternative locations to hunt without the permission of a private landowner. This could lead to an overall decline in deer harvest in the San Juan Islands.

There is limited effort to control of wildlife that adversely affect natural resources on public lands in the San Juan Islands. The National Park Service is in the early stages of planning for prairie restoration near Monument land at Cattle Point (National Park Service 2012). While a draft plan has not been released, this effort will consider control of nonnative wildlife. If the National Park Service undertakes control, a coordinated approach on nearby public lands would be beneficial; this could occur under alternatives B, C, and D, but would not occur under Alternative A. Given that there has been no wildlife control within the Monument in the past, the BLM assumes it would not occur under the No Action Alternative.

None of the alternatives would have direct impacts on special status or federally listed species because legal harvest of these species would not be allowed within the Monument regardless of which alternative is selected. As described above, deer harvest and control of certain wildlife could improve the condition of potential habitat for the island marble butterfly. This could lead to an increase in overall suitable habitat in the San Juan Islands. The BLM does not expect there would be a contribution to negative cumulative effects on special status wildlife from hunting or wildlife control.

Chapter 4 – Consultation and Coordination

Introduction

Partnerships are an essential component to the successful management of the Monument. The Monument's many locations are dispersed throughout the San Juan Islands and share boundaries with lands and waters managed by Federal, State, and local governments, in addition to private individuals and organizations. The San Juan Islands are part of the ancestral territories of the Coast Salish peoples. Active participation by tribal partners in Monument management honors their long-standing relationship with the landscape and helps the BLM more effectively manage sensitive values and relate the Coast Salish people's history and culture to the wider public.

This chapter describes public involvement and agency consultation and coordination for this Draft RMP/EIS. The list of the preparers of this RMP/EIS can be found in Appendix M.

The NEPA and associated regulations and policies require the BLM to seek public involvement throughout the planning process to develop a reasonable range of alternatives and to prepare environmental documents that disclose the potential significant impacts.

Public involvement and agency consultation and coordination were achieved through Federal Register notices, one-on-one and multi-agency meetings, public meetings and workshops, individual contacts, media releases, newsletters, and the San Juan Islands National Monument RMP website. The BLM also has the benefit of working with the Monument Advisory Committee.

Public Involvement

Public scoping for the RMP began with the publication of a Notice of Intent to Prepare a Resource Management Plan in the Federal Register on March 2, 2015. During scoping, the BLM widely distributed press releases and sent 191 hard copy letters and 102 emails to potentially interested parties announcing the initiation of the scoping process and describing how to participate. The BLM also held five public meetings, one at each of the following locations: Lopez Island, Friday Harbor (San Juan Island), Eastsound (Orcas Island), Anacortes (the city from which the ferry departs), and on the interisland ferry. The BLM received 88 comments during the scoping period. The scoping report summarizes these comments and provides the planning issues and revised planning criteria.

During the winter and spring of 2016, the BLM solicited public comments on human use (i.e., recreation) management in the Monument. During this time, the BLM held four workshops, in addition to one Monument Advisory Committee meeting, at which members of the public were invited to use large-scale maps to provide information on recreational uses they would like to see facilitated, limited, or prohibited. They also provided feedback on trails they would like to see maintained, closed, or developed and the uses the BLM should allow on each trail. The BLM used the feedback from these meetings to develop the RMA Frameworks in Appendix O and the Draft Travel and Transportation Plan in Appendix H. The BLM received 554 comments from 91 individuals during this time.

During the development of the Draft RMP/EIS, the BLM has sent 17 newsletters to the RMP interested parties email list, which includes over 350 subscribers. These newsletters provide updates on the planning effort, as well as other Monument-related news.

The scoping report and the summary of input from the 2016 workshops are available on the RMP website: https://go.usa.gov/xRphc

Monument Advisory Committee

Proclamation 8947 required that the BLM "shall prepare and maintain a management plan for the monument and shall establish an advisory committee under the Federal Advisory Committee Act (5 USC App.) to provide information and advice regarding the development of such plan." The Monument

Advisory Committee is composed of twelve members: two representing recreation and tourism interests, two representing wildlife and ecological interests, two representing cultural and heritage interests, two representing the public-at-large, one representing tribal interests, one representing local government, one representing education and interpretation interests, and one representing private landowners.

The Monument Advisor Committee has provided invaluable guidance to the BLM on the Monument's values, the human uses of the Monument, and on how the BLM can best incorporate the public into the planning effort. The committee met with the BLM 11 times during the development of the Draft RMP/EIS. All committee meetings are open to the public and include a public comment period. The BLM will continue to meet with the committee throughout the planning process.

Government-to-Government Relationships

Federally recognized tribes have a unique relationship with the Federal government, because they are sovereign nations and retain inherent powers of self-government. The BLM consults with tribes on a government-to-government basis. Numerous laws, regulations, and policies describe the requirement of Federal agencies to notify and consult with Native American tribes and to consider their rights and interests when planning and implementing Federal undertakings. In recognition of its responsibility to federally recognized tribes, the BLM conducts government-to-government consultation with tribes to identify areas of mutual interest and concern and to consider the potential effects of Federal undertakings and actions on tribal rights and interests.

The San Juan Islands are part of the ancestral territories of the Coast Salish peoples. The BLM invited potentially affected tribes—listed below—to participate in government-to-government consultation in the development of this RMP. Consulting tribes have provided invaluable information on the relationship of the Coast Salish peoples with the San Juan Islands and approaches to managing the Monument.

Twelve federally recognized Native American tribes are known to have interests in the Monument:

Jamestown S'Klallam Tribe	Skokomish Indian Tribe
Lower Elwha Tribe	Stillaguamish Tribe of Indians
Lummi Nation	Suquamish Tribe
Nooksack Tribe	Swinomish Indian Tribal Community
Port Gamble S'Klallam Tribe	Tulalip Tribes of Washington
Samish Indian Nation	Upper Skagit Tribe

The BLM sent pre-scoping letters to potentially interested tribes to notify them of the planning effort. The BLM formally initiated government-to-government consultation via letters from the BLM Oregon/Washington State Director in April of 2015. The BLM has solicited input from tribal governments throughout the planning process. This included opportunities to review and provide comments on preliminary drafts of Chapter 2 and 3 of this document, as well as a pre-publication draft of the full Draft RMP/EIS. The BLM has met in person with representatives of individual tribes throughout the planning process. The BLM has also met with representatives of multiple tribes on two occasions to discuss the range of alternatives and the analysis.

The BLM will continue government-to-government consultation with the federally recognized Coast Salish tribes throughout the planning process. The BLM continues to seek opportunities to deepen cooperative partnerships with tribes.

Cooperating Agencies

The FLPMA and NEPA provide direction regarding the coordination and cooperation of Federal agencies with other Federal agencies and Tribal, State, and local governments. Cooperating agency status provides a formal framework for governmental units (including Tribal, Federal, State, and local) to engage in active collaboration with a lead Federal agency to implement requirements of the NEPA. For this RMP,

the BLM has worked with cooperators from many agencies. With all formal cooperators, the BLM has signed a memorandum of understanding, identifying the roles and responsibilities of the BLM and the cooperating agency in the planning process.

Thirteen Tribal, Federal, State, and local governments/agencies have signed MOUs to participate in the development of the RMP/EIS as cooperating agencies:

- City of Anacortes
- National Park Service, San Juan Island National Historical Park
- Port Gamble S'Klallam Tribe
- Samish Indian Nation
- San Juan County
- Skokomish Indian Tribe
- State of Washington
- Stillaguamish Tribe of Indians
- Town of Friday Harbor
- Tulalip Tribes of Washington
- U.S. Coast Guard
- U.S. Fish and Wildlife Service
- U.S. Navy, Naval Air Station Whidbey Island

The Jamestown S'Klallam Tribe, U.S. EPA, NOAA Fisheries, Skagit County, and Whatcom County formally declined the BLM's invitation to participate as cooperating agencies.

The BLM invited agencies with jurisdiction by law and/or special expertise to participate as cooperating agencies in April of 2015. The BLM has solicited input from cooperating agencies throughout the planning process. This included opportunities to review and provide comments on preliminary drafts of Chapter 2 and 3 of this document, as well as a pre-publication draft of the full Draft RMP/EIS. The BLM has met with the cooperating agencies as a group on five occasions during the development of the Draft RMP/EIS, in addition to engaging with sub-sets of the cooperating agency group through calls focused on specific topics. The BLM will continue to engage with cooperating agencies throughout the planning process.

Regulatory Agency Consultation

In addition to the coordination and cooperating mentioned above, the BLM consults with specific agencies that have regulatory duties under the Endangered Species Act and the National Historic Preservation Act. These consultations can be formal or informal and are ongoing throughout the planning process. The BLM will complete consultation before issuing a Record of Decision.

The BLM will consult with the U.S. FWS and NOAA Fisheries on the Proposed RMP under Section 7 (a)(2) of the Endangered Species Act. As part of this consultation, the BLM will prepare biological assessments that describe the impacts of implementing the Proposed RMP. In these biological assessments, the BLM will describe the Proposed RMP, the geographic area it will address, and the way it would affect threatened, endangered, and proposed species and their designated and proposed critical habitats. The BLM will submit these biological assessments to the U.S. FWS and NOAA Fisheries.

The U.S. FWS and NOAA Fisheries will issue biological opinions. These evaluate whether the proposed RMP would be likely to jeopardize the continued existence of any threatened, endangered, or proposed species or if it would adversely modify their critical habitats.

The BLM notified the Washington SHPO in March of 2015 that the BLM was preparing an RMP for management of the Monument. The State of Washington signed on as a cooperating agency in January of 2016 with the Deputy SHPO identified as an agency representative. The BLM has received input from SHPO at several stages of the planning process, including on the range of alternatives and the preliminary analysis of the effects of the alternatives. The BLM will solicit comments from the SHPO on the development of the Proposed RMP/Final EIS and will continue to consult about undertakings pursued in accordance with an approved RMP.

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