



GRASI

Gulf Regional Airspace Strategic Initiative



Eglin Air Force Base, Florida



LANDSCAPE INITIATIVE ENVIRONMENTAL IMPACT STATEMENT

1 **COVER SHEET**

2 **GULF REGIONAL AIRSPACE STRATEGIC INITIATIVE (GRASI) LANDSCAPE**
3 **INITIATIVE DRAFT ENVIRONMENTAL IMPACT STATEMENT**

4 **a. Responsible Agency:** U.S. Air Force, 96th Test Wing (96 TW) – Eglin Air Force Base (AFB),
5 Florida, in coordination with the Florida Forest Service (FFS).

6 **b. Cooperating Agencies:** Not Applicable

7 **c. Proposals and Actions:** This Draft Environmental Impact Statement (EIS) describes the
8 potential consequences to the human and natural environment that would result from the
9 implementation of the Proposed Action, which is the Gulf Regional Airspace Strategic
10 Initiative (GRASI) Landscape Initiative (GLI) in the region of northwest Florida. The GRASI is a
11 United States (U.S.) Air Force-led partnership with state and federal agencies to expand the
12 capacity of the region to safely host military test and training operations. The GLI is a
13 component of GRASI that is evaluated in this EIS. The GLI involves a partnership with the
14 State of Florida in this regard to utilize state lands for training activities. Specifically, this EIS
15 addresses locations in the Blackwater River and Tate’s Hell State Forests for general training
16 operations and small, noncontiguous land areas throughout the region for permanent and
17 mobile radar emitter sites.

18 **d. Comments and Inquiries:** Written comments on this document should be directed to
19 Mr. Mike Spaits, Eglin AFB Public Affairs Office, 96 TW/PA, 101 West D Avenue, Room 238,
20 Eglin AFB, FL 32542-5499, (850) 882-2836, or michael.spaits@us.af.mil. Comments may also be
21 submitted electronically at <http://grasieis.leidoseemg.com>; additional information on the GLI
22 EIS may also be found at this website. To ensure the Air Force has sufficient time to include
23 public input in the preparation of the Final EIS, written comments from the public should be
24 submitted by June 23, 2014.

25 **e. Designation:** Draft Environmental Impact Statement

26 **f. Abstract:** This Draft EIS has been prepared in accordance with the National Environmental
27 Policy Act (NEPA) to analyze the potential environmental consequences of the proposed GLI
28 at Eglin AFB, Florida, and the No Action Alternative. The Proposed Action consists of two
29 main components: obtaining necessary permits to use emitter training sites and areas of
30 northwest Florida state forests for nonhazardous training activities. Training activities would
31 involve some minor land disturbance (no land development), use of wheeled vehicles on
32 established roads only, cross-country troop movements, helicopter and light aviation
33 landings on established landing zones (existing roads and cleared areas), and use of blank
34 ammunition in select areas. Use of the forests would be accomplished through lease
35 agreements with the FFS, and would initially occur a few times annually, with frequency
36 increasing as the program becomes more established. All training would be conducted in
37 conformance with FFS forest management plans. This EIS analyzes potential impacts
38 associated with airspace, noise, land use, socioeconomics and environmental justice,
39 transportation, utilities, air quality, safety, solid waste, hazardous materials and hazardous
40 waste, physical resources, biological resources, and cultural resources. This EIS also identifies
41 mitigations and best management practices (BMPs) that the proponent could implement to
42 minimize or offset potential adverse impacts.

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1 HOW TO USE THIS DOCUMENT

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7 pressing the “left-arrow” key on the keyboard.



- 8
- 9 • **The [Executive Summary](#)** provides a summary of information in this EIS.
 - 10 • **Chapter [1](#), Purpose and Need**, explains why the proposed action is needed.
 - 11 • **Chapter [2](#), Description of the Proposed Action and Alternatives**, describes what
12 activities and alternatives are involved.
 - 13 • **Chapter [3](#), Affected Resource Assessment**, identifies what could be affected by the
14 proposed action and talks about regulations and how we assess impacts.
 - 15 • **Chapter [4](#), Emitter Sites Affected Environment/Environmental Consequences**,
16 describes the possible effects near proposed emitter sites.
 - 17 • **Chapter [5](#), Blackwater River State Forest Affected Environment/Environmental
18 Consequences**, focuses on activities within Blackwater River State Forest.
 - 19 • **Chapter [6](#), Tate’s Hell State Forest Affected Environment/Environmental
20 Consequences**, focuses on activities within Tate’s Hell State Forest.
 - 21 • **Chapter [7](#), Cumulative Impacts**, talks about potential cumulative impacts when
22 combining the proposed action with past, present, and reasonably foreseeable future
23 actions.
 - 24 • **Chapter [8](#), No Action Alternative Impact Analysis**, describes the potential impacts
25 from not implementing the proposed action.
 - 26 • **Chapter [9](#), Other NEPA Considerations**, compares the proposed short-term use of
27 the environment and resources with their long-term productivity, and describes the
28 commitment of nonrenewable resources, energy requirements and conservation
29 potential of proposed alternatives and mitigation measures, as well as requirements
30 for natural or depletable resources and the potential to conserve environmental
31 resources.
 - 32 • Chapter [10](#) includes a bibliography; Chapter [11](#) has a list of preparers; Chapter [12](#) is an
33 index, and Chapter [13](#) provides a short glossary.

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1 EXECUTIVE SUMMARY

2 The Gulf Regional Airspace Strategic Initiative (GRASI) region (Figure ES-1) consists of the
3 eastern Gulf of Mexico region, which includes northwest Florida, southern Mississippi, lower
4 Alabama, southern Georgia, and the eastern Gulf of Mexico. The GRASI is a collaborative
5 planning effort between military and civilian leaders designed to ensure the future availability
6 and capacity of regional airspace and training lands for military use and the continued
7 economic prosperity of the Gulf coast. The entire GRASI planning process, goals, objectives,
8 and strategies are in the *GRASI Strategic Plan*, at <http://grasi.leidoseemg.com>.

9 This Draft Environmental Impact Statement (EIS) examines the potential environmental
10 impacts resulting from the implementation of the Proposed Action, which is the GRASI
11 Landscape Initiative (GLI) in the region of northwest Florida. The GLI is a U.S. Air Force-led
12 partnership with the State of Florida and federal agencies to expand the capacity of the
13 region to safely host military test and training operations. Specifically, this EIS addresses
14 locations in the Blackwater River State Forest (BRSF) and Tate's Hell State Forest (THSF) (Figure
15 ES-2) for general training operations, as well as small, noncontiguous land areas throughout
16 the region for permanent and mobile radar emitter sites.

17 ES.1. ENVIRONMENTAL IMPACT ANALYSIS PROCESS (EIAP)

18 The proposed activities addressed within this document constitute a federal action and,
19 therefore, must be assessed in accordance with the National Environmental Policy Act (NEPA).
20 NEPA requires federal agencies to consider the environmental consequences of proposed
21 actions in the decision-making process (42 United States Code [USC] 4321, et seq.). The
22 Council on Environmental Quality (CEQ) was established under NEPA, 42 USC 4342, et seq., to
23 implement and oversee federal policy in this process. In 1978, the CEQ issued regulations
24 implementing the NEPA process under Title 40, Code of Federal Regulations (CFR), Parts
25 1500–1508. The Air Force EIAP for meeting CEQ requirements is accomplished via procedures
26 set forth in CEQ regulations and 32 CFR Part 989. This EIS has been prepared in accordance
27 with NEPA and 32 CFR Part 989.

Figure ES-1. GRASI Regional Airspace

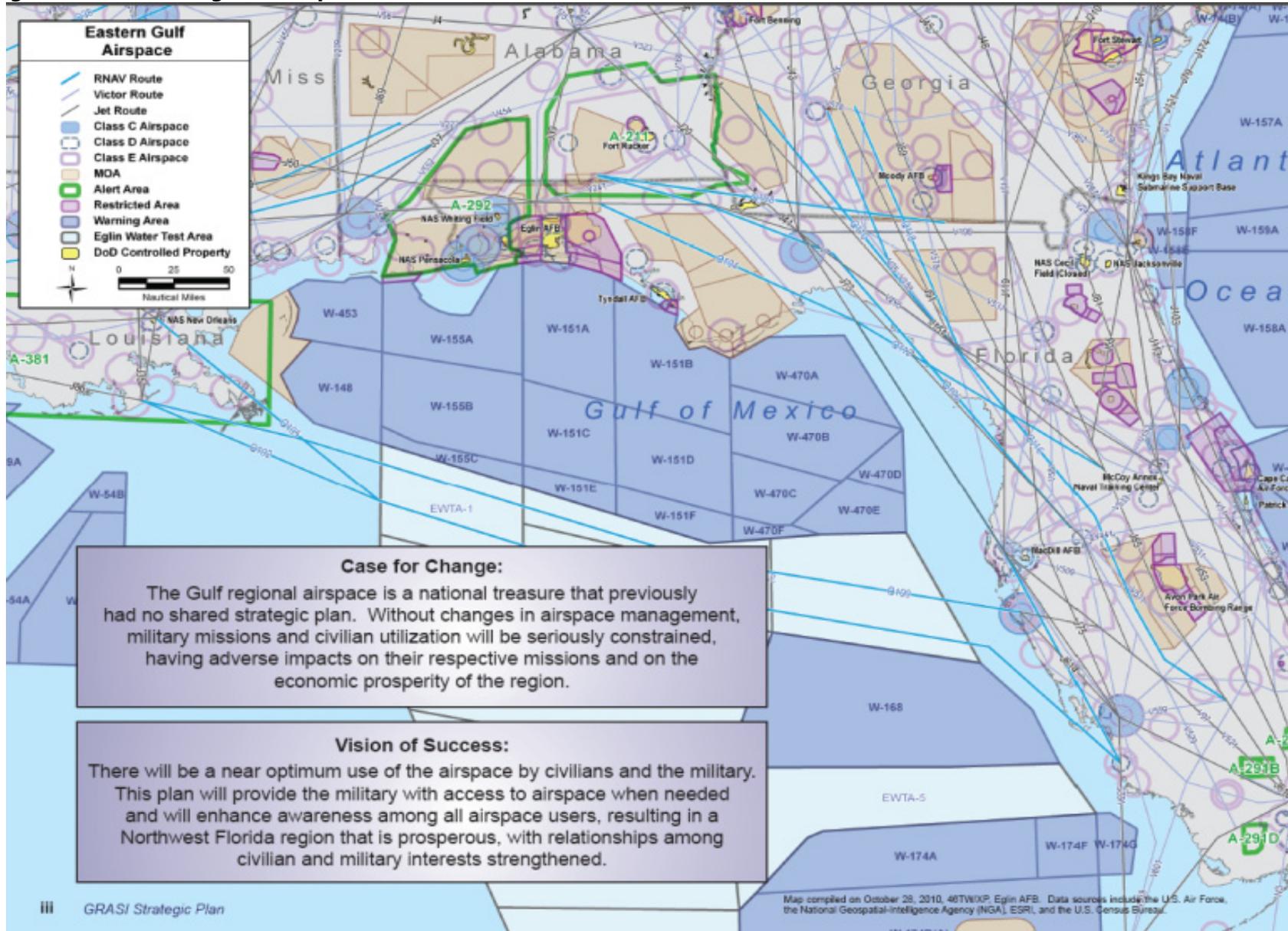
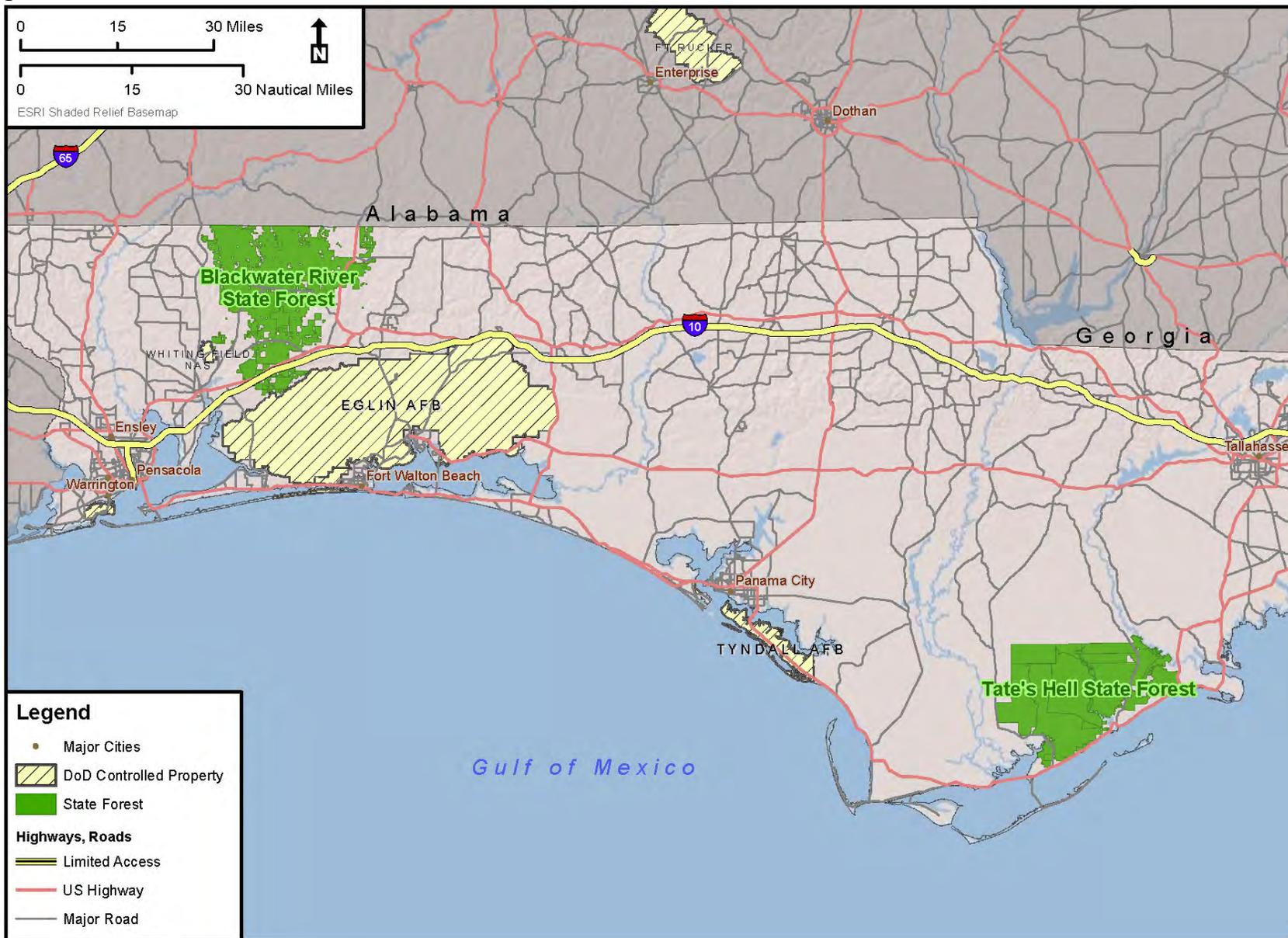


Figure ES-2. Location of Blackwater River and Tate's Hell State Forests



1 **ES.2. PURPOSE AND NEED**

2 **ES.2.1 Purpose**

3 The purpose of the Proposed Action is to analyze the suitability of state lands already
4 identified by state agencies, pursuant to memorandums of agreement under the *GRASI*
5 *Strategic Plan*, as potentially available for conducting a variety of nonhazardous military
6 training activities. The intent of the GLI is not to establish new, dedicated-use military ranges
7 but rather to develop additional training flexibility and diversity potentially available through
8 established partnerships and agreements for use when training flexibility at existing military
9 bases is not available. The intent of the GLI, therefore, is to provide military units with
10 compatible locations that can serve as an outlet for training activities when they are
11 otherwise unable to meet their requirements using current military training areas.

12 Specifically, this Proposed Action (the GLI, a component of the GRASI) is designed to develop
13 additional regional training flexibility for nonhazardous military operations. This would be
14 accomplished through two types of partnerships. The Air Force would partner with the State
15 of Florida to obtain permits to use lands that the state has already identified as potentially
16 available for training: BRSF and THSF (Figure ES-2). In addition, the Air Force would partner
17 with the Florida Forest Service (FFS) and Florida Fish and Wildlife Conservation Commission
18 (FWC) for use of associated lands for placement of temporary and mobile training radar
19 emitters.

20 **ES.2.2 Need**

21 The Proposed Action is needed because there is a projected regional shortfall of military
22 training and testing land and airspace in the GRASI region. The demand for the land range
23 and use of restricted areas (RAs) over the Eglin Range Complex creates scheduling conflicts
24 for nonhazardous training. Obtaining the necessary permits to use new areas for
25 nonhazardous training and placing training emitters in remote locations would create
26 flexibility, improving training outcomes through better scheduling and reducing the
27 competing demands on RA. Eglin Air Force Base's (AFB's) primary mission is test and
28 evaluation, and training activities sometimes have a lower priority.

29 These measures would allow some mission activities a place to operate when the airspace is
30 already being used by other mission activities. Emitter sites create realistic threat scenarios for
31 pilots and more realistic training scenarios by simulating an integrated air defense system
32 (IADS), which helps with identifying and countering enemy missile or artillery threats from
33 land or sea.

1 **ES.3. DECISION TO BE MADE**

2 For purposes of this EIS, the decision to be made is whether to implement the Proposed
3 Action (create flexibility by obtaining necessary permits/leases to use emitter sites in
4 northwest Florida and conduct training activities as another permitted user of BRSF and THSF)
5 or the No Action Alternative. The decision to be made also includes how to implement
6 elements of the Proposed Action and the frequency of training activities. Implementation of
7 the No Action Alternative would mean continuing all current training activities at the Eglin
8 Range Complex using training workarounds to try to meet units' training needs to the
9 maximum extent possible. Using training workarounds are not anticipated to meet all unit
10 training requirements, particularly as the GRASI region becomes subject to greater demands.

11 **ES.4. PROPOSED ACTION AND ALTERNATIVES**

12 The Proposed Action consists of two main components: establishment and use of emitter
13 training sites on GRASI partner lands and applying to the FFS and FWC to be a permitted user
14 of the northwest Florida state forests for nonhazardous training activities. This Proposed
15 Action may not provide the most comprehensive solution for all training needs, as described
16 in Sections 2.1 and 2.2. Should other partnerships identify additional training locations, they
17 will be considered in conjunction with the appropriate level of additional NEPA analysis. At
18 this time, no other suitable training locations have been identified as potentially available for
19 use and no other elements of the GLI proposal have adequate project definition to warrant
20 inclusion in this EIS.

21 **ES.4.1 Proposed Action**

22 **ES.4.1.1 Emitter Sites**

23 A component of the Proposed Action is to establish up to 12 radar, telemetry, and emitter
24 training sites throughout northwest Florida to support development of a simulated IADS to
25 be used for air training. Radar and telemetry emitters are used for tracking aircraft and
26 navigation; training emitters are radar simulator systems designed to help train military
27 personnel to identify and counter enemy missile or artillery threats from land or sea. Types of
28 emitters would vary depending on need, and their use would be determined by constraints
29 associated with the site and respective operational parameters of the specific system. As an
30 example, use of high-powered systems with large safety hazard distances may be restricted at
31 sites in close proximity to populated areas.

32 Emitter training sites identified would utilize FFS and FWC lands via leasing agreements.
33 These sites would accommodate mobile and temporary use; mobile use means that the site
34 would be used for a day with operators on-site, while temporary use may last for several days.
35 Proposed locations are shown in Figure ES-3. The majority of sites identified as part of the
36 screening process are associated with FFS fire spotting towers, while two sites are owned by
37 FWC and one site by Eglin AFB. All sites are either "improved" or "semi-improved." Not all
38 proposed sites may be used, and only several at any one time would be operational.

1 **ES.4.1.2 Training Activities in Northwest Florida State Forests**

2 Training activities associated with the Proposed Action consist of utilizing existing areas
3 cleared by the FFS as part of regular forest management activities for helicopter landing and
4 drop zones, use of existing airfields and roadways for aircraft landings, and a number of
5 different land and air training activities. These activities currently occur in the areas between
6 designated test/training sites on the Eglin Range. Specifically, two state forests in northwest
7 Florida, BRSF and THSF, would be leased through agreements with FFS.

8 For the purposes of this EIS, each state forest has been divided into “tactical areas” (TAs),
9 which correlate to each state forest recreational area as shown in Figures ES-4 and ES-5.
10 Training activities may occur in any of the TAs, with consideration of restrictions identified via
11 coordination with the FFS during the planning process, as well as any constraints or
12 mitigations identified in this EIS. Training in the TAs would provide flexibility for those
13 test/training units that are unable to schedule time on the Eglin Range or in the RA due to
14 other higher-priority activities or range congestion.

15 All training activities in the state forests would be conducted per the requirements of Eglin
16 AFB Instruction (EAFBI) 13-212, *Range Planning and Operations*, Chapter 7 – Environmental
17 Management (December 2010, Interim Change on 9 September 2011), as applicable, and in
18 accordance with the respective state forest management plans. EAFBI 13-212, Chapter 7, is
19 available at <http://grasieis.leidoseemg.com/documentation.aspx>.

20 The following subsections summarize proposed training activities; more detailed information
21 can be found in Section 2.3.2 of the GLI EIS. These activities would be carried out by units of
22 Air Force Special Operations Command located at Hurlburt Field, units of the 7th Special
23 Forces Group (Airborne) located at Eglin AFB, F-35 Joint Strike Fighter and support units, and
24 other Department of Defense units.

25 Training activities described under the Proposed Action are not mutually exclusive, and some
26 training activities would occur in support of other activities or subsequent to other training
27 activities. An example would be a training mission involving several helicopters flying from
28 Eglin AFB to a BRSF tactical area Helicopter Landing Zone/Drop Zone (HLZ/DZ) where
29 personnel and equipment would be dropped via an Airdrop or a low-level
30 insertion/extraction. Personnel may then conduct Cross-Country Dismounted Movement
31 (CCDM) training to hardened camp site location or another helicopter landing zone, while
32 along the way bivouacking, Conducting Communications and Surveillance Operations
33 (CCSO), and utilizing expendables. Once reaching their objective, they would be extracted
34 either via another low-level insertion/extraction or Cross-Country Vehicle Movement (CCVM).
35 Aircraft would use existing military operations areas and controlled airspace, as is currently
36 done, to maneuver between Eglin AFB and the state forests.

Figure ES-3. Location Overview of Proposed Emitter Sites

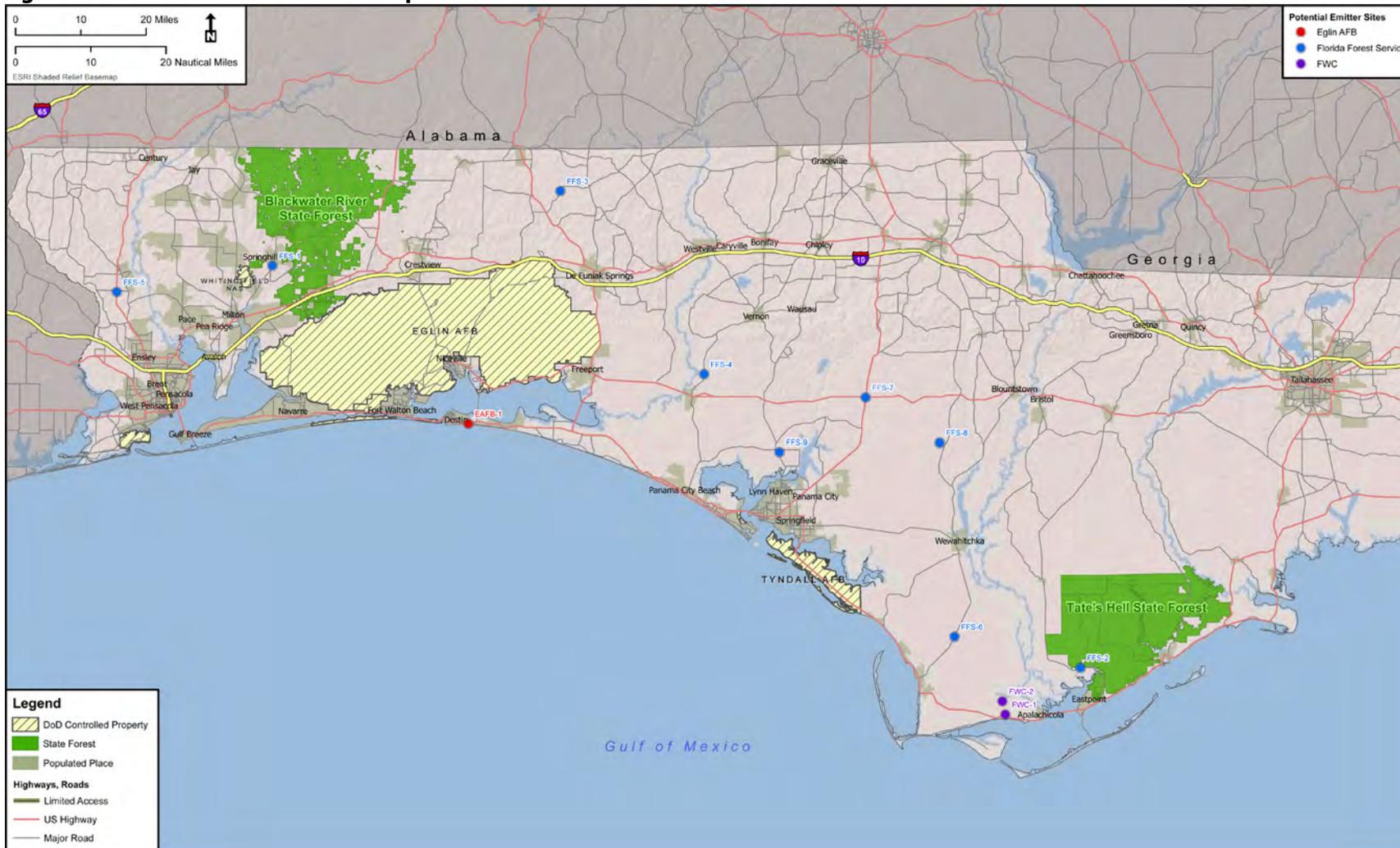


Figure ES-4. BRSF Tactical Areas

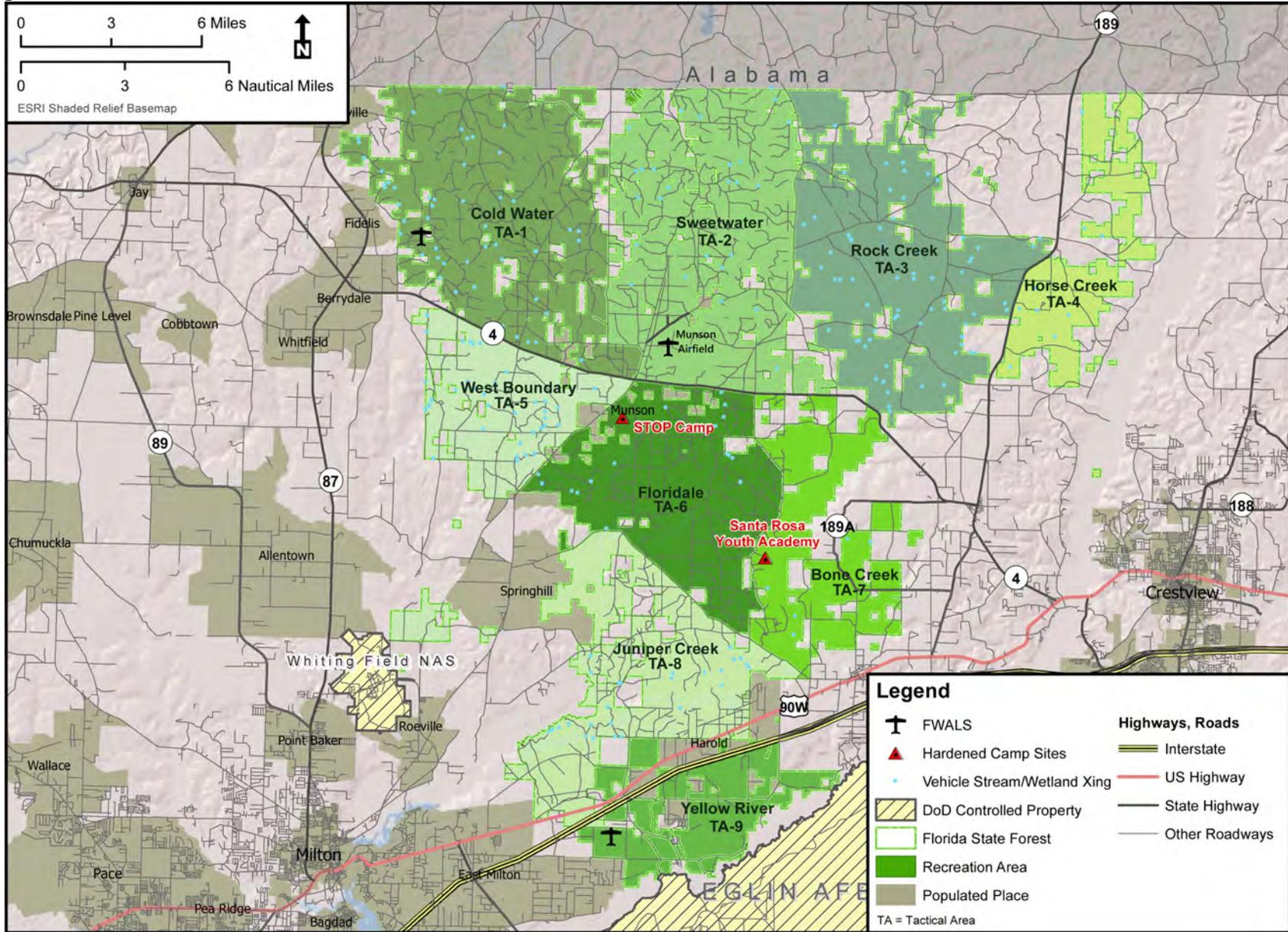
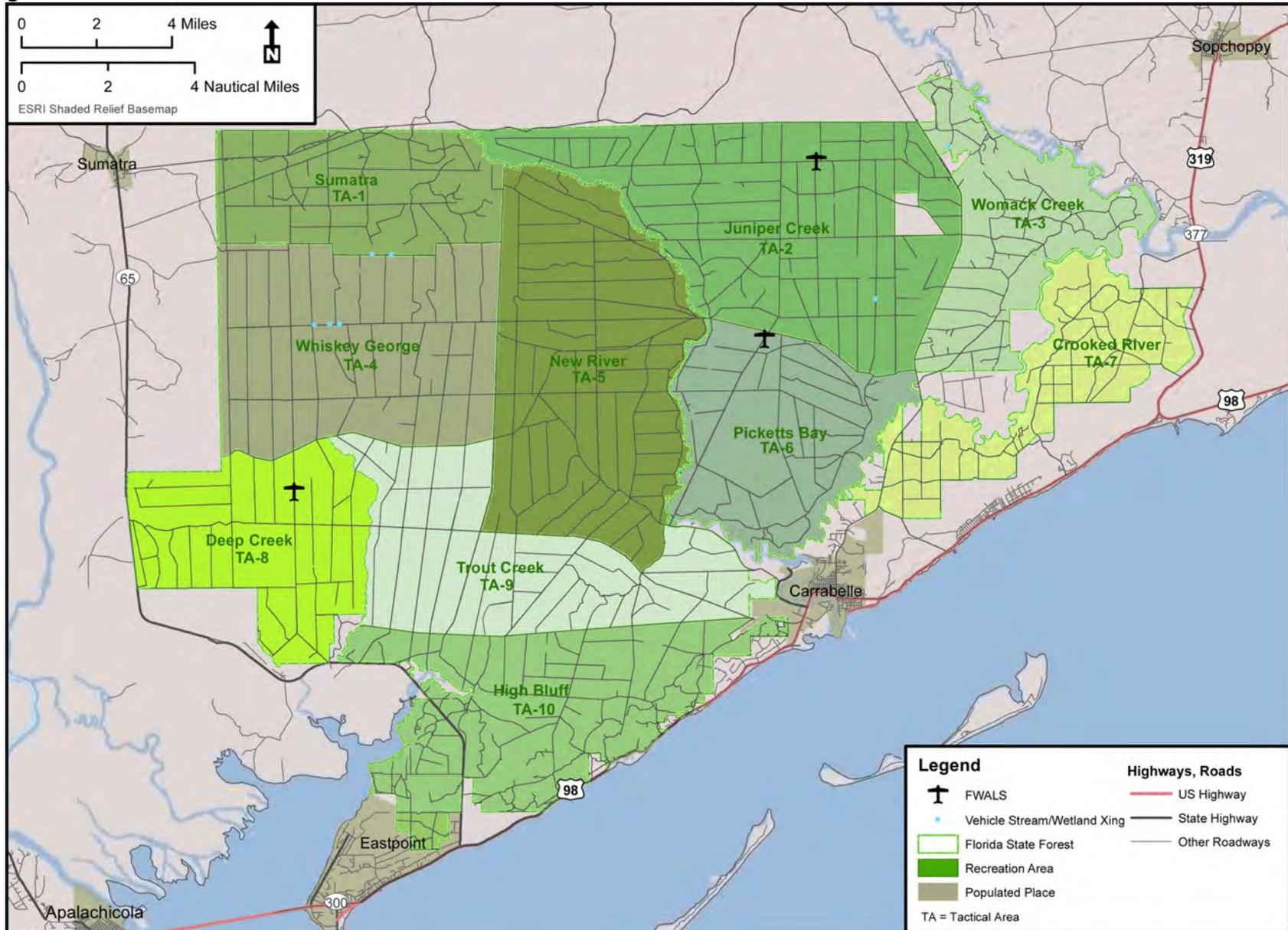


Figure ES-5. THSF Tactical Areas



1 **ES.4.1.2.1 Helicopter Landing Zones/Drop Zones**



Typical HLZ/DZ

Existing cleared areas within the state forests would be utilized as HLZs/DZs for personnel and equipment from various aircraft (either fixed or rotary wing). Several sites located throughout the state forests may be established and utilized at any one time. These sites would be open areas that have already been cleared of tall vegetation by the FFS through regular forest management activities. Table ES-1 details HLZ/DZ activities.

11 **Table ES-1. HLZ/DZ Details**

Vehicles / Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
Construction equipment ¹	Varies depending on size and location of HLZ/DZ.				Only utilize locations previously cleared by the FFS as part of regular forest activities. No land disturbance in wetlands or floodplains; no new impervious surfaces.

HLZ = Helicopter Landing Zone; DZ = Drop Zone; FFS = Florida Forest Service

1. Establishment, operations, and maintenance as part of regular FFS activities.

12 **ES.4.1.2.2 Fixed-Wing Aircraft Landing Sites**

13 Fixed-Wing Aircraft Landing Sites (FWALS) involve the use of existing airstrips and dirt
 14 roadways for fixed-wing aircraft landings, takeoffs, and touchdowns in support of other
 15 training activities. At BRSF, one existing airfield would be utilized (Munson Airfield, currently
 16 designated for public use with no restrictions) and two dirt roadways (one in TA-1 and one in
 17 TA-9) are proposed for aircraft operations. At THSF, three dirt roadways are proposed in
 18 support of aircraft operations. These roadways are located in TA-2, -6, and -8. Table ES-2
 19 details FWALS.

20 **Table ES-2. FWALS Details**

Vehicles/Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
Construction equipment ¹	Varies depending on size and location of landing site.				Only utilize locations previously approved by the FFS. No land disturbance in wetlands or floodplains; no new impervious surfaces.

FWALS = Fixed-Wing Aircraft Landing Sites; FFS = Florida Forest Service

1. Establishment, operations, and maintenance as part of regular FFS activities.

ES.4.1.2.3 Use of Expendables

Use of Expendables (UoEX) involves use of various training munitions and pyrotechnics, including simulated munitions (consisting of plastic pellets or paintballs, which produce little or no noise) and smoke grenades during training activities. At BRSF, noise-generating expendables (e.g., blanks) would only be used at hardened camp site locations. At THSF, noise-generating expendables could be used anywhere (pending results of analysis and consideration of use restrictions as identified in this EIS). Table ES-3 details UoEX activities.



Smoke Grenade

Table ES-3. UoEX Details

Expendable Type	Estimated Maximum Quantity Per Year	Estimated Average Per Event	Restrictions
5.56-millimeter blank	576,000	~10,000	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Police brass/expendable waste, avoid public use areas when using blanks. At Blackwater River State Forest, noise-generating expendable use only at hardened camp sites.
7.62-millimeter blank	196,200	~8,000	
Ground burst simulators	5,172	~2 to 5	
M-18 smoke grenades	4,038	~2 to 5	
Paintballs/plastic pellets	50,000	~5,000	
Flares	Emergency use only – not associated with training activities		

ES.4.1.2.4 Light Aviation Proficiency Training

Light Aviation Proficiency Training (LAPT) involves use of established FWALS identified previously for fixed-wing aircraft takeoff and landing training. Table ES-4 details LAPT activities.

Table ES-4. LAPT Details per Event

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
One aircraft per event, combination of Casa-212, PC-12, C-145	N/A	Paintballs/plastic pellets, M-18 smoke grenades	2 hours Day and night	5 times/day, 232 days/year (spread out among landing sites)	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of noise impacts to private landowners and inhabited recreational sites during approach and departure.

LAPT = Light Aviation Proficiency Training

1 **ES.4.1.2.5 Low-Level Helicopter Insertions/Extractions**

2 Low-Level Helicopter Insertions/Extractions (LLHI/E) involve flying helicopters near treetop
 3 level and above to an HLZ/DZ and inserting or extracting
 4 personnel. Insertion/extraction of personnel is conducted via
 5 fast rope, rappel, ladder, hoist or other means. Aircraft would
 6 fly between just above the surface to 3,000 feet above ground
 7 level (AGL). Table ES-5 details LLHI/E activities.



LLHI/E Activity

8 **Table ES-5. LLHI/E Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of UH-60, CH-47, MH-47 There would be no more than two CV-22s used per event.	Up to 50 inserted/extracted	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	2 hours Day and night	2 times/month (spread out among HLZs/DZs)	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of inhabited recreational sites.

DZ = Drop Zone; GBS = ground burst simulator; HLZ = Helicopter Landing Zone; mm = millimeter; LAPT = Light Aviation Proficiency Training; LLHI/E = Low-Level Helicopter Insertions/Extractions; THSF = Tate's Hell State Forest

9 **ES.4.1.2.6 Temporary Combat Support Areas**



TCSA Activity 15

Temporary Combat Support Areas (TCSAs) involve set up of logistical and medical tents and equipment around HLZs/DZs and FWALS in support of training activities. Table ES-6 details TCSA activities.

16 **Table ES-6. TCSA Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
May arrive at location via various aircraft or land vehicles	Up to 50	Paintballs/plastic pellets, M-18 smoke grenades, tents, generators THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day and night	5 times/month	During hunting season night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of inhabited recreational sites.

GBS = ground burst simulator; mm = millimeter; TCSA = Temporary Combat Support Area; THSF = Tate's Hell State Forest

1 ES.4.1.2.7 Airdrops

2 Airdrops (ADs) involve the insertion and/or resupply of
3 personnel via release of troops or equipment over land-
4 based DZs or over water. This activity would be in support of
5 training activities. Table ES-7 details AD activities.



Static Line Personnel Drop

6 **Table ES-7. Airdrop Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of UH-60, CH-47, C-130, C-17, C-145; CV-22 There would be no more than two CV-22s used per event.	Up to 72 depending on associated training activity and aircraft.	Land drops: approximately 15 cubic foot container of water (~300 pounds); containerized delivery system (~500 pounds); paintballs/plastic pellets, M-18 smoke grenades Water drops: two Zodiacs	24 hours Day and night	4 times/day, 232days/year (spread out among HLZs/DZs) C-17 used 2-3 times/year	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoid inhabited recreational sites and public boaters. No power motors in Bear Lake (BRSF). Avoidance of noise impacts to private landowners and inhabited recreational sites during approach and departure.

BRSF = Blackwater River State Forest; DZ = Drop Zone; HLZ = Helicopter Landing Zone

7 ES.4.1.2.8 Air/Land Vertical Lift

8 Air/Land Vertical Lift (A/LVL) involves the insertion and/or
9 resupply of personnel and/or equipment via landing an aircraft
10 directly into an HLZ or on a fixed-wing aircraft landing site. Table
11 ES-8 details A/LVL activities.



A/LVL Activity

12 **Table ES-8. A/LVL Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of CV-22, UH-60, CH-47, C-130, C-145. There would be no more than two CV-22s used per event.	Up to 72 depending on associated training activity and aircraft.	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	4x/day 232 days/year (spread out among HLZs/DZs/ FWALS)	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of noise impacts to private landowners and inhabited recreational sites during approach and departure.

A/LVL = Air/Land Vertical Lift; DZ = drop zone; GBS = ground burst simulator; HLZ = helicopter landing zone; mm = millimeter; THSF = Tate's Hell State Forest; FWALS = Fixed-Wing Aircraft Landing Sites

ES.4.1.2.9 Forward Air Refueling Point/Hot Gas Operations

Forward Air Refueling Point/Hot Gas Operations (FARP/HGO) involves the transfer of fuel during refueling operations from aircraft to aircraft or refueling truck to aircraft with aircraft engines running. It is not likely that this activity would occur at BRSF because it is so close to Eglin AFB. Additionally, because of the requirement within EAFBI 13-212 (Chapter 8) to only conduct this activity on hardened surfaces, and because there would be no hardened surface development at either forest, this activity would likely only occur at local airports in the vicinity of the forests. FARP/HGO activity is included in the EIS as the Air force might need to conduct this activity at BRSF under emergency circumstances. The Air Force currently conducts these activities on Eglin AFB airfields and at other airports local to THSF. Table ES-9 details FARP/HGO activities.

Table ES-9. FARP/HGO Details per Event

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of CV-22, UH-60, CH-47, C-130 There would be no more than two CV-22s used per event. Fuel trucks (250 to 2,500 gallons)	4 to 8 personnel	None	24 hours Day or night	2 times/year	May only occur on hardened surfaces (i.e., concrete or asphalt).

FARP/HGO = Forward Air Refueling Point/Hot Gas Operations

ES.4.1.2.10 Cross-Country Dismounted Movements

CCDMs involve the movement of operators (i.e., personnel) on foot across land areas from one location to another as part of simulated assault and reconnaissance training activities. CCDM may occur on or off roads or on unimproved trails. CCDM may also include crossing of streams and wetland areas. Table ES-10 details CCDM activities.



Table ES-10. CCDM Details per Event

CCDM Activity

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
None	Up to 72 depending on associated training activity	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSS	24 hours Day or night	2 times/quarter	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoid inhabited recreational sites.

CCDM = Cross-Country Dismounted Movement; GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

1 ES.4.1.2.11 Cross-Country Vehicle Movement



CCVM Activity

CCVM involves the movement of personnel transport vehicles (ranging from high-mobility multipurpose wheeled vehicles [HMMWVs] to 2.5-ton trucks) and all-terrain vehicles (ATVs) across established roads from one location to another in support of resupply, logistics, and troop transport. CCVM would utilize established roadways and associated easements. Table ES-11 details CCVM activities.

9 **Table ES-11. CCVM Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
HMMWVs, 2.5-ton trucks, motorcycles, minibikes, lightweight tactical ATVs	Up to 5/vehicle Up to 10 vehicles	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	3 times/quarter	Vehicles are restricted to forest roads, designated roads only. During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise.

ATV = all-terrain vehicle; CCVM = Cross-Country Vehicle Movement; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate's Hell State Forest

10 ES.4.1.2.12 Vehicle Stream and Wetland Crossing

11 Vehicle Stream and Wetland Crossing (VSWC) involves
12 fording of intermittent and perennial streams and wetlands
13 by military vehicles at crossing points currently established
14 and utilized by the FFS. Table ES-12 details VSWC activities.



VSWC Activity

16 **Table ES-12. VSWC Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, 2.5-ton trucks, motorcycles, minibikes, lightweight tactical ATVs (quad runners)	Up to 5/vehicle Up to 10 vehicles	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	3 times/quarter	Designated roads only at designated stream crossings.

ATV = all-terrain vehicle; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate's Hell State Forest; VSWC = Vehicle Stream and Wetland Crossing

ES.4.1.2.13 Blackout Driving

Blackout Driving (BD) involves nighttime driving of ATV-type vehicles and HMMWVs without full headlights. Headlights would be diminished to “cat eyes,” which are essentially small slits placed over the headlights; this provides enough light to utilize night vision goggles while driving. Roads used for this activity would be temporarily closed (likely in concert with emplacement of obstacles) to the public to prevent safety mishaps. Table ES-13 details BD activities.

Table ES-13. Blackout Driving Details per Event

Vehicles/Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Motorcycles, lightweight tactical ATVs (quad runners), HMMWVs	Up to 5/vehicle Up to 10 vehicles	None	8 hours	3 times/quarter	Only on closed/designated roads, thus no public conflict.

ATV = all-terrain vehicle; HMMWV = high-mobility multipurpose wheeled vehicle

ES.4.1.2.14 Emplacement of Obstacles

Emplacement of Obstacles (EoO) involves placement of concertina wire along unpaved roads and hardened camp sites. The ground surface may be slightly disturbed (within 6 inches of ground surface) from placement of stakes and pickets. All wire, stakes, and/or pickets would be recovered at completion of the training exercise. Table ES-14 details EoO activities.



EoO Activity

Table ES-14. EoO Details per Event

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
N/A	N/A	Concertina wire and barbed wire Stakes/pickets	Length of associated training exercise Day or night	10 times/year	Removal of all obstacles after exercise. During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise.

EoO = Emplacement of Obstacles

1 ES.4.1.2.15 Bivouacking/Assembly Areas



B/AA Activity 8

Bivouacking/Assembly Areas (B/AA) involve the use of an area, mainly tented, where troops eat and rest overnight in support of training activities. There may be slight surface ground disturbance (within 6 inches of ground surface) from placement of tent stakes and pickets. All expendables/equipment would be recovered prior to leaving the site. Table ES-15 details B/AA activities.

9 **Table ES-15. B/AA Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Three ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Tents and other supplies. Stakes/pickets	Length of associated training exercise. Day or night	10 times/year	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise.

ATV = all-terrain vehicle; B/AA = Bivouacking/Assembly Areas

10 ES.4.1.2.16 Communications and Surveillance Operations

11 Communications and Surveillance Operations (C&SO) involve the use of sites to coordinate
12 communications and/or conduct surveillance of “enemy forces” in support of training
13 activities. The ground surface may be slightly disturbed from placement of tent stakes and
14 pickets. Table ES-16 details C&SO activities.

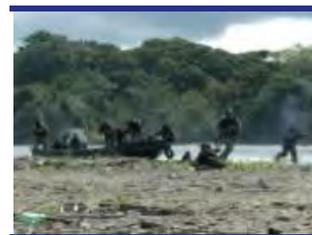
15 **Table ES-16. C&SO Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
HMMWVs, rental vehicles (trucks), ATVs, and trailers to haul equipment	Up to 72 depending on associated mission activity.	Communication equipment, radio antennas, tents, radar equipment, camouflage nets, generators	Length of associated training exercise Day or night	Monthly	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of inhabited recreational sites.

ATV = all-terrain vehicle; C&SO = Communications and Surveillance Operations; HMMWV = high-mobility multipurpose wheeled vehicle

1 **ES.4.1.2.17 Amphibious Operations**

2 Amphibious operations involve boat operations on the water,
 3 loading/unloading of personnel to and from boats, and movement
 4 in streams, rivers, and lakes as part of egress/ingress operations.
 5 Table ES-17 details amphibious operations activities.



Amphibious Operations

6 **Table ES-17. Amphibious Operations Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Up to six various inflatable and rigid powered watercraft per event; engines 35 to 200 hp. Watercraft may consist of Zodiacs and aluminum boats up to 28 feet with or without outboard motors.	Up to 6/watercraft	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	12 hours Day and night	10 times/year	Avoid inhabited recreational sites and public boaters. No power motors in Bear Lake (BRSF).

BRSF = Blackwater River State Forest; hp = horsepower; mm = millimeter; THSF = Tate’s Hell State Forest

7 **ES.4.1.2.18 Natural Resource Consumption**

8 Natural Resource Consumption (NRC) involves the procurement of natural food sources, such
 9 as small game and rodents (utilizing survival techniques such as trapping/snaring) and eating
 10 of vegetation. Locations of avoidance areas (e.g., sensitive habitat areas and species) would
 11 be communicated to participants prior to implementation of the activity. Table ES-18 details
 12 NRC activities.

13 **Table ES-18. NRC Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
N/A	20 (10 teams at 2/team)	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	7 days Day and night	2 times/quarter	Avoid protected wildlife and plants.

GBS = ground burst simulator; mm = millimeter; NRC = Natural Resource Consumption; THSF = Tate’s Hell State Forest

1 **ES.4.1.2.19 Overwater Hoist Operations**

2 Overwater Hoist Operations (OHO) involve hoist rescue and
 3 recovery of personnel and watercraft over water. Aircraft would
 4 conduct operations from just above the surface of the water to
 5 a height of about 150 feet. Aircraft would hover about 10 feet
 6 over the surface for drops and about 80 feet above the surface
 7 for retrievals. Table ES-19 details OHO activities.



OHO Activity

8 **Table ES-19. OHO Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Watercraft (see Table) Four total aircraft, combination of CV-22, HH-60, CH-47 There would be no more than 2 CV-22s used per event.	Up to 6/watercraft, including one safety swimmer, coxswain, medic, and assistant coxswain	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	4 to 6 hours Day and night	1/month	No power motors in Bear Lake (BRSF). Avoid fishermen and boaters.

BRSF = Blackwater River State Forest; GBS = ground burst simulator; mm = millimeter; OHO = Overwater Hoist Operations; THSF = Tate's Hell State Forest

9 **ES.4.1.2.20 Opposing Forces Vehicle Operations**

10 During Opposing Forces Vehicle Operations (OFVO), two teams (one "Red," the other "Blue")
 11 compete to locate each other on established roads in a simulated urban environment.
 12 Personnel may exit vehicles to conduct "search activities." Aircraft may be used as a "spotter"
 13 to direct one of the teams; the aircraft would fly at between 16,000 and 23,000 feet AGL. Table
 14 ES-20 details OFVO activities.

15 **Table ES-20. OFVO Details per Event**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
HMMWV Cessna 172 aircraft	Up to 5/vehicle Up to 10 vehicles	M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	Day and night	5 times/week	Vehicles are restricted to forest roads, designated roads only. During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoid inhabited recreational sites.

GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; OFVO = Opposing Forces Vehicle Operations; THSF = Tate's Hell State Forest

1 **ES.4.1.2.21 Hardened Camp Site Use**



9 **Urban Combat Training**
10

Hardened Camp Site Use (HCSU) involves use of two hardened camp facilities located at BRSF. Both camps were established by the Florida State Department of Juvenile Justice (DJJ); one is identified as the Short-Term Offender Program (STOP) Camp, the other is the Santa Rosa Youth Academy. The STOP Camp was leased by the DJJ from FFS and returned after the program was shut down. These sites consist of buildings and infrastructure, such as utilities and roadways, and may be used as insertion/extraction points,

11 HLZs/DZs, command and control centers, training areas for combat in urban environment
12 training, or other training activity support. Table ES-21 details HCSU activities.

13 **Table ES-21. HCSU Details per Event (BRSF)**

Vehicles / Aircraft	# Personnel	Expendables / Equipment	Duration	Frequency	Restrictions
Aircraft: CV-22, HH-60, CH-47 There would be no more than two CV-22s used per event. Vehicles: ATV-types, HMMWVs	Up to 50	5.56-mm blanks, 7.62-mm blanks, GBSs, paintballs/plastic pellets, M-18 smoke grenades; simunitions	24 hours Day and night	5 times/week 232 days/year	Upkeep and maintenance of facility.

ATV = all-terrain vehicle; BRSF = Blackwater River State Forest; HCSU = Hardened Camp Site Use; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter

14 **ES.4.2 Operational Constraints**

15 Section 2.5 of the EIS outlines more than 100 operational constraints associated with the
16 Proposed Action. The operational constraints are components of the Proposed Action and
17 would be implemented as part of the GLI proposal. The constraints serve to minimize or
18 alleviate adverse impacts to the human and natural environment.

19 In order to ensure that all General Operational Constraints are identified and adhered to by
20 training units, Eglin AFB's environmental management program has developed "Protection
21 Levels" for areas on the Eglin Range that are utilized for ground training activities. These levels
22 are based on General Operational Constraints and are integral to environmental resource
23 protection. Under the Proposed Action, the Air Force would utilize a similar system tailored
24 for BRSF and THSF; protection levels for the Proposed Action for both ground operations and
25 noise are described in Tables ES-22 and ES-23, respectively, and are applicable to all training
26 locations within the boundaries of the state forests. Activity outside the boundaries of the
27 state forests is limited to use of public roadways for transportation.

1 **Table ES-22. General Protection Levels for Proposed Action Ground Operations**

Protection Level	Restrictions	Area Covered
Prohibited	No access is permitted.	Camp/recreational sites, any cultural resource "prohibited areas," piping plover critical habitat (THSF).
Restricted	All activities must remain on roadbeds of established roads, including troop movements, vehicle operations, digging, and any type of ground surface disturbance. No refueling of vehicles or aircraft allowed.	1,500 feet around flatwoods salamander habitat; apiaries; sensitive species point locations and associated FNAI sensitive habitats: pitcher plant bogs, rare plants, rare animals, invasive species.
RCW Buffer	Follow <i>Management Guidelines for the Red-Cockaded Woodpecker on Army Installations</i> (U.S. Army, 2007) and <i>Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion</i> (U.S. Air Force, 2013), Table 4-2.	200-foot buffer around RCW cavity trees for ground operations.
Bald Eagle Nest Buffer	During nesting season (October 1 to May 15), follow <i>National Bald Eagle Management Guidelines</i> (USFWS, 2007)	1,000-foot buffer around nest for aircraft operations; 330-foot buffer for ground training operations. Currently there are no GIS data for eagle nests at either forest. However, should a nest be identified, these protections would be applied.
Wood Stork Habitat Buffer	Follow <i>Habitat Management Guidelines for the Wood Stork in the Southeast Region</i> (USFWS, 1990).	500-foot buffer around wood stork feeding/roosting habitat. Currently there are no GIS data for habitat at either forest. However, should habitat be identified these protections would be applied.
Limited Use-1 (LU-1)	<u>Approved Activities:</u> use of star cluster pyrotechnics (hand-held slap flares) only for emergency purposes; use of nonlethal small arms ammunition such as blanks and paintballs (at BRSF approved for paintballs only); see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver and incidental and consumptive land disturbance. <u>Not Approved:</u> use of smokes, flares, or simulators; off-road vehicle use – all vehicles must remain on established roads; land development and point land disturbance outside of previously disturbed roadbeds and road shoulders. LZ/DZ use except on approved FFS sites not requiring additional land development; see Noise Protection Levels Map for further restrictions on LZ/DZ use. No refueling of vehicles or aircraft allowed.	100 feet around wetlands, water bodies and floodplains; areas exhibiting very limiting soil characteristics (e.g., susceptible to erosion) for HLZ and/or bivouacking; cultural resource areas with inadequate surveys and/or "not cleared" areas; Tate's Hell Camp Gordon Johnson Historic District.
Limited Use-2 (LU-2)	<u>Approved Activities:</u> use of pyrotechnics (e.g., smoke grenades and GBSs) and nonlethal small arms ammunition such as blanks and paintballs (at BRSF approved for smoke grenades and paintballs only, with GBSs permitted only at hardened camp sites); see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver. Incidental, point, and consumptive land disturbance (includes catholes) outside of previously disturbed roadbeds and road shoulders if approved by FFS. LZ/DZ use only on approved FFS sites with FFS coordination required for any additional land disturbance; see Noise Protection Levels Map for further restrictions on LZ/DZ use. Refueling of vehicles or aircraft allowed only on asphalt or concrete surfaces. <u>Not Approved:</u> off-road vehicle use – all vehicles must remain on established roads.	All areas not covered by other protection levels.

BRSF = Blackwater River State Forest; DZ = drop zone; FFS = Florida Forest Service; FNAI = Florida Natural Areas Inventory; GBS = ground burst simulator; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative; HLZ = helicopter landing zone; LU-1 = Limited Use-1; LU-2 = Limited Use-2; LZ = landing zone; RCW = red-cockaded woodpecker; THSF = Tate's Hell State Forest

1

Table ES-23. Noise Protection Levels for Proposed Action Operations

Vehicles / Aircraft	Restrictions	Area Covered
Not Approved for HLZs/DZs	No HLZs or DZs permitted.	2,200-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.
RCW Air Operations Buffer	No aircraft operations permitted.	500-foot buffer around RCW trees.
Not Approved for Overflights below 500 feet AGL	No overflights below 500 feet AGL	200-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.
Not Approved for Noise Generating Expendables	No noise generating expendable use allowed; includes blanks and GBSs.	4,000-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.

AGL = above ground level; DZ = drop zone; HLZ = helicopter landing zone; RCW = red-cockaded woodpecker

2 As stated previously, General Operational Constraints are inherent to the Proposed Action, in
 3 that they are considered components of the Proposed Action’s implementation. As an
 4 example, a 200-foot activity buffer around identified red-cockaded woodpecker (RCW) cavity
 5 trees is a requirement of EAFBI 13-212. Just as CCDM at BRSF and THSF is a component of the
 6 Proposed Action, so too is the requirement to maintain a 200-foot activity buffer around RCW
 7 trees at either BRSF or THSF, since EAFBI 13-212 would be a component of the Proposed
 8 Action. Impact analysis in this EIS considers these requirements as part of the initial impact
 9 assessment. Thus, analysis of impacts to the RCW considers the implementation of the 200-
 10 foot activity buffer in the initial impact assessment; if potentially adverse impacts are
 11 identified, then Proposed Resource-Specific Mitigations were developed to minimize or avoid
 12 this potential.

13 **ES.4.3 No Action Alternative**

14 Under the No Action Alternative, the training activities identified under the Proposed Action
 15 would continue to occur on Eglin AFB as described and assessed in the *Interstitial Area Range*
 16 *Final Environmental Assessment Revision 2* and *Eglin AFB Riverine/Estuarine Environmental*
 17 *Assessment*. BRSF and THSF would not be utilized, and no new emitter sites would be used.

18 The No Action Alternative would not meet the purpose and need for the Proposed Action, in
 19 that there would be continued stress on the Eglin AFB user environment due to conflicts with
 20 hazardous and nonhazardous training activities. As use of the Eglin Range increases, these
 21 conflicts would become more frequent and problematic. Activities at BRSF, THSF, and the
 22 various proposed emitter sites would continue as described in the respective state forest
 23 management plans.

24 **ES.5. ALTERNATIVE IMPACT ANALYSIS SUMMARY**

25 The following provides an impact summary of the analyses presented in the Draft EIS
 26 Chapters 3, 4, 5, and 6. Details on each specific action and the potential impacts as related to
 27 the respective location can be found in these chapters. The significance of impacts was
 28 determined by evaluating the context, intensity, and duration of the action (40 CFR 1508.27)
 29 and the relative effect on individual resources; context, intensity, and duration factors used in
 30 the analyses are described in each respective Chapter 3 resource area discussion. The impact

1 analyses considers direct, indirect and cumulative impacts on resource along with how both
2 beneficial and adverse impacts affect public safety, the characteristics of the geographic area
3 and proximity of the Proposed Action to sensitive resources, the potential controversial
4 nature of the potential impact, whether possible effects are highly uncertain or involve
5 unique or unknown risks, whether the action may establish a precedent for future actions
6 with significant effects, cumulative impacts, impacts to cultural resources or endangered
7 species, and whether the Proposed Action threatens to violate Federal, State, or local laws or
8 environmental protection requirements. Each of these aspects are addressed as appropriate
9 in the applicable resource area sections and chapters in this EIS.. General criteria for impacts
10 to resource/issue areas are summarized below and are presented relative to individual
11 resource/issue areas at each proposed location in Table ES-24:

- 12 • **Beneficial** – Beneficial impacts may occur under any context, intensity, or duration.
13 These generally result in some benefit or overall improvement to the resource
14 impacted by the action. Such impacts may include a reduction in air emissions or
15 restoration of habitats; the scope of the impact directly related to the context,
16 intensity and duration of the impact. Elimination of baseline air emissions, or
17 restoration of large areas of disturbed wetland may be considered significant
18 beneficial impacts, while a small reduction in baseline air emissions or restoration of a
19 small pocket of wetlands may be considered beneficial but relatively insignificant.
20 Other than providing benefits to Air Force training capabilities, the Air Force has not
21 identified any significant or insignificant beneficial impacts under the Proposed
22 Action.
- 23 • **Adverse** – Adverse impacts generally result in detriment or degradation of the
24 impacted resource, the degree or level of impact directly related to the context,
25 intensity, and duration of the impact. The Air Force has identified the potential for
26 adverse impacts for several resource areas; resources experiencing potential adverse
27 impacts are shaded yellow in Table ES-24. Adverse impacts can either be significant or
28 insignificant.
 - 29 ○ **Significant** – Physical aspects are easily perceptible, and typically endure over
30 the medium-to-long term, with a regional context and a high intensity;
31 however, significant impacts can occur potentially over the short term under
32 any context given a high intensity. Significant adverse impacts are typically not
33 recoverable over the short term, and require long term recovery processes with
34 extensive mitigation or revision of Proposed Action to avoid or minimize
35 impacts. An example of a significant adverse impact would be destruction of
36 large percentages of wetland areas or degradation of water quality that may
37 affect human health and the environment.
 - 38 ○ **Insignificant** – These impacts are typically short- to medium-term impacts
39 under any context or intensity. Beneficial impacts that are not significant in
40 nature may include restoration of small pockets of wetlands. Adverse but not
41 significant impacts are typically recoverable over the short-to-medium term
42 with mitigations required to minimize level of impact or potential for impact,
43 the extent of mitigation dependent on the identified context and intensity of

1 the impact. Examples of adverse impacts that are not significant may be short,
2 intermittent increases in noise to transient recreational users that do not affect
3 overall usability of the forest, or the potential for localized, intermittent soil
4 erosion on stream banks due to troop movement over the land-water interface
5 during dismounted movements and amphibious operations. These are
6 recoverable impacts over the short-term through Proposed Resource-Specific
7 Mitigations to avoid noise sensitive areas for training in the case of noise
8 impacts, and for soil impacts minimizing the size of troop units conducting
9 ground training activities, rotating land-water interface ingress/egress points,
10 and not using ingress/egress points that show signs of erosion.

- 11 • **Neutral or No Effect** – These are impacts that are typically of a low-intensity, such that
12 they are imperceptible regardless of context or duration. Such impacts, whether
13 beneficial or otherwise, are recoverable over the short term without mitigation and
14 result in no overall perceptible change to the resource. Resources experiencing
15 neutral or no effects are identified as “green” in Table ES-24.

16 Impacts were evaluated with consideration of implementation of General Operational
17 Constraints inherent to the Proposed Action associated with EAFBI operational procedures
18 and other NEPA-related documents for similar actions occurring on the Eglin Range on similar
19 resources. General Operational Constraints are a prerequisite for implementing the Proposed
20 Action. Once analyses were completed, additional Proposed Resource-Specific Mitigations
21 were identified to avoid or minimize adverse impacts to relatively impacted resources.

22 Overall, the Air Force has not identified any significant beneficial or adverse impacts
23 associated with the Proposed Action. While the Air Force has identified the potential for
24 adverse impacts to various resources, these impacts would be insignificant based on the
25 context, intensity and duration of the identified impacts as described throughout Chapters 3,
26 4, 5, and 6. Impacts to public health and safety would be either avoided or minimized
27 through implementation of operational constraints and mitigations. Any unique geographic
28 characteristics (e.g., sensitive habitats, areas prone to erosion, etc.) associated with the
29 proposed emitter or training sites would be avoided, and any potential adverse impacts to
30 the quality of the human environment would be minimal (mainly the potential for occasional
31 annoyance to recreational users from noise). There are no unknown risks or impacts that may
32 be considered controversial in nature associated with emitter site use or training activities
33 (such actions have been extensively analyzed in this EIS and other Air Force documents as
34 referenced in this EIS), and the Proposed Action is not precedent setting because the DoD
35 utilizes public lands throughout the United States for both emitter sites and military training.
36 Adverse impacts to cultural resources and endangered species have been identified;
37 however, these impacts would also be minimized/mitigated through implementation of
38 operational constraints and mitigations as identified through consultation under the National
39 Historic Preservation Act and the Endangered Species Act, respectively. Additionally, the use
40 of emitter sites and conduct of training activities would comply with all Federal, State, and
41 local laws. Finally, the Air Force has not identified any significant potential for cumulative
42 impacts (as discussed in Chapter 7). Therefore, based on the context, intensity, and duration
43 of impacts identified in this EIS the Air Force has not identified significant beneficial or
44 adverse impacts under the Proposed Action.

- 1 More detail on impacts can be found in the respective resource-specific discussions provided
 2 in the associated EIS sections identified in Table ES-24.

3 **Table ES-24. Summary of Impacts and Associated Location in EIS**

	Proposed Action			No Action
	Emitter Sites	Blackwater River State Forest	Tate's Hell State Forest	
Airspace	Sections 3.2/4.2	Sections 3.2/5.2	Sections 3.2/6.2	Chapter 8
Noise	Sections 3.3/4.3	Sections 3.3/5.3	Sections 3.3/6.3	
Safety	Sections 3.4/4.4	Sections 3.4/5.4	Sections 3.4/6.4	
Air Quality	Sections 3.5/4.5	Sections 3.5/5.5	Sections 3.5/6.5	
Earth Resources	Sections 3.6/4.6	Sections 3.6/5.6	Sections 3.6/6.6	
Water Resources	Sections 3.7/4.7	Sections 3.7/5.7	Sections 3.7/6.7	
Biological Resources	Sections 3.8/4.8	Sections 3.8/5.8	Sections 3.8/6.8	
Cultural Resources	Sections 3.9/4.9	Sections 3.9/5.9	Sections 3.9/6.9	
Land Use	Sections 3.10/4.10	Sections 3.10/5.10	Sections 3.10/6.10	
Socioeconomics/ Environmental Justice	Sections 3.11/4.11	Sections 3.11/5.11	Sections 3.11/6.11	
Hazardous & Solid Materials/Waste	Sections 3.12/4.12	Sections 3.12/5.12	Sections 3.12/6.12	
Infrastructure/ Transportation	Sections 3.13/4.13	Sections 3.13/5.13	Sections 3.13/6.13	

- 4 The Air Force completed consultation with the United States Fish and Wildlife Service
 5 (USFWS) in accordance with Section 7 of the Endangered Species Act (ESA) on April 8, 2014
 6 and has received concurrence on a finding of Not Likely to Adversely Affect sensitive species
 7 or habitat (USFWS, 2014). The Air Force has notified the Florida State Historic Preservation
 8 Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Native American tribes
 9 in accordance with Section 106 of the National Historic Preservation Act (NHPA). A list of
 10 agencies and tribes contacted is provided in the Draft EIS Appendix B, *Public and Agency*
 11 *Involvement*, while ESA and NHPA consultation documentation is provided in the Draft EIS
 12 Appendix C, *Consultation Documentation*. All completed NHPA consultation documents,
 13 including responses and findings from cultural resource consultation agencies, will be
 14 provided in the Final EIS.

15 **ES.6. NO ACTION ALTERNATIVE IMPACT ANALYSIS**

- 16 Implementation of the No Action Alternative means that none of the Proposed Action
 17 components as described in Sections 4.1.1 and 4.1.2 would occur at the respective locations
 18 (emitter sites, BRSF, and THSF). All activities would remain on Eglin AFB, and no new emitter
 19 sites would be established. There would be no impacts to the proposed emitter sites, BRSF, or
 20 THSF beyond those resulting from normal activities at these locations, such as recreational
 21 use and typical forest management activities conducted by the FFS as identified in the
 22 respective state forest management plans. Evaluation of the impacts of these activities on the
 23 affected environment is beyond the scope of this EIS.

1 Impacts to the Eglin Range and associated airspace would be as described in the *Eglin AFB*
2 *Final Interstitial Range Environmental Assessment Revision 2* (U.S. Air Force, 2013c), the *Eglin AFB*
3 *Riverine/Estuarine Final Programmatic Environmental Assessment* (U.S. Air Force, 2004), and the
4 *Eglin AFB Final Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force,
5 2006).

6 **ES.7. PROPOSED RESOURCE-SPECIFIC MITIGATIONS**

7 Based on the scope of activities associated with the Proposed Action, the inherent General
8 Operational Constraints identified in Section 2.5 of the EIS, and related impact analyses
9 detailed in the EIS, there are no identified Resource-Specific Mitigation impact minimization
10 procedures necessary for the following resource areas: air quality, solid/hazardous materials
11 and waste, and infrastructure and transportation.

12 Impact analysis of the Proposed Action has identified Proposed Resource-Specific Mitigations
13 that would be implemented, in addition to General Operational Constraints in EIS Section 2.5,
14 to further minimize or avoid adverse impacts for the following resources: airspace
15 management, noise, earth resources, water resources, biological resources, safety, and land
16 use. These Proposed Resource-Specific Mitigations are detailed in Section 2.7 of the EIS. In
17 most cases impacts would be minimized such that impact significance levels would be
18 reduced from “adverse” (yellow) to “neutral” or “no effect” (green) in Table ES-24.

19 **ES.8. CUMULATIVE IMPACTS**

20 Cumulative effects analysis considers the potential environmental impacts resulting from “the
21 incremental impacts of the action when added to other past, present, and reasonably
22 foreseeable future actions regardless of what agency or person undertakes such other
23 actions” (40 CFR 1508.7). In this EIS, the Air Force has made an effort to identify actions on or
24 near the action areas associated with the Proposed Action that are under consideration and in
25 the planning stage at this time.

26 The Air Force evaluated the potential for significant cumulative impacts associated with the
27 Proposed Action. No unmitigatable adverse impacts have been identified for use of emitter
28 sites, thus the Air Force has not identified any correlating potential for cumulative impacts
29 from emitter site use. Although the Proposed Action would result in incremental impacts
30 when associated with identified past, present, and reasonably foreseeable future actions at
31 BRSF and THSF, the Air Force does not expect the Proposed Action to result in any significant
32 adverse cumulative impacts.

33 **ES.9. OTHER NEPA CONSIDERATIONS**

34 **ES.9.1 Relationship Between Short-term Use and Long-term Productivity**

35 ***Short-Term Uses***

36 The Proposed Action would have minor short-term effects related to use of resources during
37 land improvements in support of FWALS and HLZs, consumptive use, traveling, use of
38 produced materials, fuels, etc. As a mitigating component of short-term uses of the

1 environment, the Proposed Action would create economic benefits during training activities
2 in the form of some jobs and the direct and indirect demand for goods and services.

3 ***Long-Term Productivity***

4 Based on analysis of the Proposed Action, the Air Force has not identified any long-term
5 adverse impacts to productivity as a result of unmitigated short-term impacts. The Proposed
6 Action would result in short-term increases in direct and indirect demand for goods and
7 services while training activities occur. Impacts would be intermittent over the long term as
8 the GLI program is established and implemented. Long-term benefits to the FFS associated
9 with lease fees would be realized through leasing agreements.

10 ***Short-Term Uses Versus Long-Term Productivity***

11 The assessment of effects on long-term productivity is related to whether the project is
12 consistent with long-term regional and local planning objectives. Under the Proposed Action,
13 there would be minor increases in employment, income, and net fiscal benefits and revenues
14 to the FFS and surrounding communities during training activities. Training activities at the
15 state forests would be scheduled to avoid conflict with hunters and other recreational users,
16 thus avoiding impacts to long-term productivity associated with recreational use of the
17 forests.

18 **ES.9.2 Irreversible and Irretrievable Commitment of Resources**

19 NEPA requires that environmental analysis identify any irreversible and irretrievable
20 commitments of resources involved in the implementation of the Proposed Action or
21 alternatives. Irreversible and irretrievable resource commitments are related to the use of
22 nonrenewable resources and the effects that the use of these resources could have on future
23 generations. Irreversible effects primarily result from the use or destruction of a specific
24 resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame.
25 Irretrievable resource commitments involve the loss in value of an affected resource that
26 cannot be restored as a result of the action (e.g., extinction of a threatened or endangered
27 species or the disturbance of a cultural site).

28 Implementing the Proposed Action would require a commitment of natural, physical, human,
29 and fiscal resources. In all of these categories, irreversible and irretrievable commitments of
30 resources would occur in the form of utilization of energy resources such as fossil fuels (for
31 transportation, associated with utility use, etc.). While none of the proposed activities involve
32 direct habitat alteration, some biological resources would be directly lost as a result of
33 consumptive use during training activities; however, no sensitive species would be impacted,
34 and the amount of general wildlife species taken would be insignificant when compared with
35 the amount of hunting taking place at each proposed location. Incidental contact (such as a
36 vehicle strike) may also result in incidental mortality to some species; while this cannot be
37 completely avoided, the potential can be minimized by implementation of the General
38 Operational Constraints and Proposed Resource-Specific Mitigations identified in the EIS.

39 **ES.9.3 Energy Requirements and Conservation Potential of Alternatives and 40 Mitigation Measures**

41 Energy requirements associated with the Proposed Action are limited to use of fossil fuels in
42 support of transportation and utility use. Conservation potential for this resource is limited to

1 general energy conservation techniques, such as making sure no lights remain on at
2 hardened camp sites, transportation pooling, etc.

3 **ES.9.4 Natural or Depletable Resource Requirements and Conservation Potential**

4 While use of natural resources as a component of the training environment would occur at
5 each forest (e.g., consumption training), use of natural resources for the Proposed Action is
6 expected to be “nonintrusive,” in the sense that the goal of the Air Force in implementing the
7 Proposed Action is to avoid to the greatest extent possible adverse impacts to natural and
8 anthropogenic resources and to be compatible with FFS forest management plans. To this
9 end, the Air Force has developed General Operational Constraints and Proposed Resource-
10 Specific Mitigations to avoid or minimize impacts on the environment. Consequently, the Air
11 Force would support conservation measures of the FFS through implementation of these
12 requirements. Other than use of fossil fuels as discussed previously, there are no requirements
13 for depletable resources associated with the Proposed Action.

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ACRONYMS AND ABBREVIATIONS

1 SOG/OGO	1st Special Operations Group/Current Operations Office
7 SFG(A)	7th Special Forces Group (Airborne)
96 CEG/CEIEA	96th Civil Engineer Group/Environmental Assets
96 CEG/CEIEC	96th Civil Engineer Group/Compliance Branch
A/C	aircraft
A/LVL	Air/Land Vertical Lift
AACI	Air Armament Center Instruction
ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
AD	Airdrop
AFB	Air Force Base
AFDT	Air Force Development Test
AFDTC	Air Force Development Test Center
AFI	Air Force Instruction
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFSOC	Air Force Special Operations Command
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
Air Force	United States Air Force
Amph	Amphibious
AO	Amphibious Operations
AOC	area of concern
APE	Area of Potential Effects
AQCR	Air Quality Control Region
ARTCC	air route traffic control center
ATC	air traffic control
ATV	all-terrain vehicle
B.C.	before Christ
B/AA	Bivouacking/Assembly Areas
BD	Blackout Driving
BEPA	Bald Eagle Protection Act
BFC	Blackwater Forestry Center
BMP	best management practice
BNOISE2™	large arms noise assessment model
BRSF	Blackwater River State Forest
C	candidate species
C&SO	Communications and Surveillance Operations
C2U	command and control unit
CAA	Clean Air Act
CCDM	Cross-Country Dismounted Movement
CCVM	Cross-Country Vehicle Movement
CDNL	C-weighted day–night average sound level

CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH₄	methane
CO	carbon monoxide
CO₂	carbon dioxide
CO₂e	carbon dioxide equivalent
COC	community of comparison
CTIT	turbine inlet temperature in degrees Celsius
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
dBC	C-weighted decibels
DHR	Division of Historical Resources
DJJ	Department of Juvenile Justice
DM	Dismounted Maneuvers
DNL	day-night average sound level
DNL_{mr}	onset rate-adjusted monthly DNL
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOF	Division of Forestry
DZ	drop zone
DZC	drop zone controller
EAFBI	Eglin Air Force Base Instruction
EED	electro explosive device
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EMF	Electro-Magnetic Frequency
EMR	electromagnetic radiation
EO	Executive Order
EoO	Emplacement of Obstacles
EPCRA	Emergency Planning and Community Right-to-Know Act
ERCF	Eglin Radar Control Facility
ERPL	Environmental Restrictions Planning Level
ERTT	Environmental Restrictions Tracking Tool
ESA	Endangered Species Act
ETR	engine thrust request
°F	degrees Fahrenheit
F.S.	Florida Statutes
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FACSFAC	Fleet Area Control and Surveillance Facility
FARP/HGO	Forward Air Refueling Point/Hot Gas Operations
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDI	Fire Danger Index

FDOF	Florida Division of Forestry
FFS	Florida Forest Service
FHWA	Federal Highway Administration
FNAI	Florida Natural Areas Inventory
FPPA	Farmland Protection Policy Act
FS	Forestry Site
FWALS	Fixed-Wing Aircraft Landing Sites
FWC	Florida Fish and Wildlife Conservation Commission
FWPCA	Federal Water Pollution Control Act
GBS	ground burst simulator
GHG	greenhouse gas
GLI	GRASI Landscape Initiative
GPS	global positioning system
GRASI	Gulf Regional Airspace Strategic Initiative
GWP	global warming potential
HCSU	Hardened Camp Site Use
HFC	hydrofluorocarbon
HLZ	helicopter landing zone
HMMWV	high-mobility multipurpose wheeled vehicle
hp	horsepower
IADS	integrated air defense system
IFF	Identification, Friend or Foe
IFR	instrument flight rule
IICEP	Intergovernmental Coordination for Environmental Planning
IR	instrument route
ISD	incidental surface disturbance
JO	Job Order
JTE	joint threat emitter
KBDI	Keetch-Byrum Drought Index
KIAS	knots indicated airspeed
KTM	Kineto Tracking Mount
kts	knots
LAPT	Light Aviation Proficiency Training
LD	Land Development
LE	listed endangered
LFO Lite	helicopter in level flight
L.I.T.	Landscape Implementation Team
LLHI/E	Low-Level Helicopter Insertions/Extractions
LOS	line of sight
LT	listed threatened
LU-1	Limited Use-1
LU-2	Limited Use-2
LZ	landing zone
LZC	Landing Zone Controller
MACA	Mid-Air Collision Avoidance
MCM	Mobile Cinetheodolite Mount

mm	millimeter
MMPA	Marine Mammal Protection Act
MOA	military operations area
mph	miles per hour
MSL	mean sea level
MTR	military training route
mW/cm²	milliwatt per square centimeter
N	not federal status
N/A	not applicable
N₂O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	Naval Air Station
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NF	fan speed
NHPA	National Historic Preservation Act
NM	nautical miles
NOISEMAP	environmental noise mapping software
NOLF	Naval Outlying Landing Field
NOTAM	Notice to Airmen
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRC	Natural Resource Consumption
NRHP	National Register of Historic Places
NVG	night vision goggle
NWFWMD	Northwest Florida Water Management District
O/Eq.	Other/Equipment
OFVO	opposing forces vehicle operations
OFW	Outstanding Florida Water
OHO	Overwater Hoist Operations
OLF	outlying landing field
Ops	operations
OSA	Occupational Safety and Health Act
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PFC	perfluorocarbons
PI	point impacts
PK 15(met)	peak level exceeded only 15 percent of the time
PK(met)	peak noise levels
PM	particulate matter
PM₁₀	particulate matter with a diameter of 10 microns or less
PM_{2.5}	particulate matter with a diameter of 2.5 microns or less
POC	point of contact
POL	petroleum, oil, and lubricants
RA	restricted area

RAPCON	radar approach control
RCRA	Resource Conservation and Recovery Act
RCW	red-cockaded woodpecker
REA	Range Environmental Assessment
RF	radio frequency
RNM	Rotorcraft Noise Model
ROCC	Range Operations Control Center
ROI	region of influence
RPM	revolutions per minute
RUSLE	Revised Universal Soil Loss Equation
SARNAM	Small Arms Range Noise Assessment Model
SATB	simulated airdrop training bundle
SEL	sound exposure level
SHD	safety hazard distance
SHPO	State Historic Preservation Officer
SO₂	sulfur dioxide
SOH	Safety and Occupational Health
SOP	standard operating procedure
SPCC	Spill Prevention, Control, and Countermeasures
SR	State Road
SRYA	Santa Rosa Youth Academy
SS	sacred sites
SSC	species of special concern
SSHA	systems safety hazard analysis
ST	state population listed as threatened by Florida Fish and Wildlife Conservation Commission
STOP	Short-Term Offender Program
SUA	special use airspace
SUV	sport utility vehicle
TA	tactical area
TCP	traditional cultural properties
TCSA	Temporary Combat Support Area
TEU	threat emitter unit
TFC	Tallahassee Forestry Center
THSF	Tate's Hell State Forest
TRACON	traffic control
TRI	Toxics Release Inventory
U.S.	United States
UoEX	use of expendables
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
Ut.	Utilities

UTBNI	up to, but not including
UXO	unexploded ordnance
VFD	volunteer fire department
VFR	visual flight rule
VOC	volatile organic compound
VORTAC	Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid
VSWC	vehicle stream and wetland crossing
WFPM	Wildland Fire Program Manager
WMA	Wildlife Management Area

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1. PURPOSE AND NEED

Click on [hyperlinks](#) to jump to an element, and hold down the "Alt" key while pressing the "left-arrow" key to GO BACK.



1.1 INTRODUCTION

This Environmental Impact Statement (EIS) has been prepared in accordance with the National Environmental Policy Act (NEPA) to analyze the potential environmental consequences of the proposed Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative (GLI) at Eglin Air Force Base (AFB), Florida. NOTE: This document is meant to be an electronic, interactive document, and all maps are identified as thumbnails within the text; clicking on the image will enlarge it for screen viewing. Those wishing to print the document will find full page maps in Appendix A.

This chapter provides background information on the GRASI planning process. It also discusses the purpose and need for the Proposed Action, the Environmental Impact Analysis Process (EIAP), cooperating agencies, consultations and coordination, decisions to be made, and the scope and format of the EIS.

1.2 BACKGROUND, SCOPE, AND HISTORY OF GRASI PLANNING

The GRASI region consists of the eastern Gulf of Mexico region, which includes northwest Florida, southern Mississippi, lower Alabama, southern Georgia, and the eastern Gulf of Mexico. The region's major industries include defense and tourism. Six major Department of Defense (DoD) installations call the area home: Eglin AFB, Tyndall AFB, Naval Air Station (NAS) Pensacola, Fort Rucker, Hurlburt Field, and NAS Whiting Field. The 2005 Base Realignment and Closure Act recommendations (which became law on November 9, 2005) assigned F-35 Joint Strike Fighters to Eglin AFB, realigned the 7th Special Forces Group (Airborne) (7 SFG[A]) to Eglin AFB, moved additional aviation training to NAS Pensacola, relocated the Defense Threat Reduction Agency National Command Region conventional armament research from Fort Belvoir, Virginia, and created an Air Integrated Weapons and Armaments Research, Development and Acquisition, Test and Evaluation Center at Eglin AFB. Further, installations across the region expect growth of preexisting missions and an increase in student populations and training readiness activities.

Each base has a need to fly around its airfields and within special use airspace (SUA), as well as transit regularly between both areas to accomplish its mission ([Figure 1-1](#)). SUA is a designated volume of airspace that segregates incompatible military operations from civilian air traffic by limiting access for aircraft not participating in the military operations. SUA includes restricted areas (RA), military



Figure 1-1. GRASI Regional Airspace

1 operations areas (MOAs), alert areas, and warning areas, each characterized by unique
2 requirements for “nonparticipating” aircraft. RA that extends to the ground over a military
3 range allows for the release of munitions from an aircraft for testing and training.

4 Regional growth is not limited to the military; since 1990, the population of the Florida
5 panhandle has increased dramatically. Traffic counts at airports across the region have also
6 steadily risen, and Bay County recently saw the opening of the first international airport
7 (Panama City–Bay County International Airport) built in the last decade. Because civilian
8 flights require access to safe and navigable airspace, commercial carriers could decide to
9 relocate or reduce operations if the airspace over the region becomes too congested.
10 Businesses that rely on general aviation and business aviation traffic could compete with
11 increased military use.

12 Military planners at Eglin AFB realized that the region needed a strategic vision and a
13 coordinated approach to optimize use of the airspace to better support regional and civilian
14 needs. The GRASI is a collaborative planning effort between military and civilian leaders
15 designed to ensure the future availability and capacity of regional airspace and training lands
16 for military use and the continued economic prosperity of the Gulf Coast. Beginning in March
17 2008, the Department of Defense (DoD) began to discuss plans to address regional training
18 constraints and capacity shortfalls. Eglin AFB initially brought together military stakeholders
19 to conduct a requirements analysis of current and future projected training requirements.
20 Participants in this requirements analysis included members of the 7 SFG(A), Air Force Special
21 Operations Command (AFSOC), the Navy, and representatives familiar with training needs of
22 the F-35 Joint Strike Fighter. DoD stakeholders documented their training requirements,
23 established a strategic vision, modeled all the airspace in the region, and recorded objectives,
24 which were developed in conjunction with civilian community leadership, for stakeholders to
25 implement.

26 The requirements analysis showed that additional airspace capacity is needed to support
27 greater levels of military training and testing, which are expected to increase through 2017.
28 Without better management and use of airspace to provide additional capacity, the military
29 mission will not be sustainable in the Gulf Coast region. The GRASI established multiple
30 objectives, including adding high-altitude military airspace, rerouting traffic during busy
31 periods, improving management facilities and communication, and expanding the military
32 capacity of the region. The entire GRASI planning process, goals, objectives, and strategies
33 are in the *GRASI Strategic Plan*, at <http://grasi.leidoseemg.com>.

34 The GRASI airspace model showed that demand on the military RA is the limiting factor on
35 the growth of testing and training activity. Further, many of the activities planned or
36 conducted in the RA are tied to nonhazardous ground activities that need not occur on a
37 range. These activities could be safely conducted outside of range property and SUA. These
38 nonhazardous activities require only a small ground party or equipment, but without
39 permission to access other areas, DoD has had to conduct these activities in range and
40 airspace reserved for hazardous missions. To alleviate congestion in RA, the United States Air
41 Force (Air Force) decided to partner with willing public and private owners of large land
42 parcels (over 10,000 acres) to investigate the potential for military use.

43 DoD began the GLI with two strategies: partner with nongovernmental organizations, states,
44 and federal agencies to gain access to new working lands and partner with owners of existing
45 working lands to investigate the potential for military use. DoD began by reviewing all

1 activities conducted in the limiting RA and documented the numbers and types of operations
2 that are or will be overtaxing the airspace.

3 In 2012, military planners began to identify potential civilian partner organizations that might
4 have the capability and interest in supporting the military mission. In February 2012, military
5 planners began reaching out to state and local organizations. Several state agencies, such as
6 the Florida Forest Service (FFS), Florida Fish and Wildlife Conservation Commission (FWC),
7 Florida Department of Environmental Protection (FDEP), and Northwest Florida Water
8 Management District (NFWFMD) expressed interest in supporting the DoD's need to
9 augment training and testing capabilities. Between October 2012 and March 2013, each of
10 these organizations signed a Memorandum of Agreement (MOA) with the Air Force
11 committing to explore solutions and alternatives for meeting the DoD's requirements for
12 additional training land and airspace (see Appendix I, *Memoranda of Agreement*).

13 The MOA between the Air Force and FFS is consistent with the recent legislative amendment
14 to the Cooperative Forestry Assistance Act, which authorizes funding for state forestry
15 agencies. In February 2014, 16 United States Code (USC) Section 2101a(c) was amended by
16 Public Law 113-79, Section 8101. Under this amendment, state foresters develop or update
17 statewide assessments and strategies in coordination, as feasible, with military installations to
18 support, promote, and contribute to their mission activities. In the planning and
19 implementation of the GLI, the Air Force will work with FFS to accomplish this coordination
20 requirement by evaluating the potential participation and management of state-owned
21 forestlands to support compatible military training activities for Eglin AFB. The Proposed
22 Action in this EIS demonstrates the initiative taken by FFS to support, promote, and
23 contribute to the mission of Eglin AFB.

24 The scope of this EIS addresses the Proposed Action that could be pursued under the current
25 GRASI planning process within the construct of the established agreements. This GLI EIS,
26 therefore, evaluates the environmental impacts of the Proposed Action that is ready for
27 decision on FFS, FWC, FDEP, or NFWFMD lands that meet the military's GRASI training needs,
28 namely, establishment and use of emitter training sites and training activities in Blackwater
29 River State Forest (BRSF) and Tate's Hell State Forest (THSF).

30 While the overarching goals of the GLI address increased flexibility for both hazardous
31 (e.g., air-to-ground live fire testing and training) and nonhazardous test and training activities
32 (e.g., ground maneuvers, helicopter landing zones [HLZs]) throughout the GRASI region,
33 increased flexibility for hazardous activities is in the initial planning stages at this time and, if
34 pursued, would be addressed in separate NEPA documentation. In other words, this EIS does
35 not address proposed actions for hazardous training activity. It should also be noted that
36 Emerald Warrior (AFSOC training in urban and irregular warfare settings currently occurring in
37 northwest Florida) is not included as part of this Proposed Action.

38 **1.3 PURPOSE**

39 The purpose of the Proposed Action is to analyze the suitability of state lands already
40 identified by state agencies, pursuant to memorandums of agreement under the *GRASI*
41 *Strategic Plan*, as potentially available for conducting a variety of nonhazardous military
42 training activities. The intent of the GLI is not to establish new, dedicated-use military ranges

1 but rather to develop additional training flexibility and diversity potentially available through
2 established partnerships and agreements for use when training flexibility at existing military
3 bases is not available. The intent of the GLI, therefore, is to provide military units with
4 compatible locations that can serve as an outlet for training activities when they are
5 otherwise unable to meet their requirements using current military training areas. The Air
6 Force proposes to pursue this increased flexibility through the GRASI planning process and
7 the partnership agreements with state agencies established in 2012 and 2013. It is hoped
8 that additional partnerships may be established and other areas identified as potential
9 training sites in the future.

10 Specifically, this Proposed Action (the GLI, a component of the GRASI) is designed to develop
11 additional regional training flexibility for nonhazardous military operations. This would be
12 accomplished through two types of partnerships. The Air Force would partner with the State
13 of Florida to obtain permits to use lands that the state has already identified as potentially
14 available for training: BRSF and THSF (Figure 1-2). In addition, the Air Force would partner
15 with FFS and FWC for use of associated lands for placement of temporary and mobile
16 training radar emitters. Because complete implementation of these two partnerships may
17 not add sufficient regional flexibility, other partnerships and areas are in the initial
18 planning stages but are not defined enough to be evaluated at this time. Such future actions,
19 if and when agreed to and defined in sufficient detail for NEPA analysis, would be evaluated at
20 the appropriate level under separate NEPA documentation.

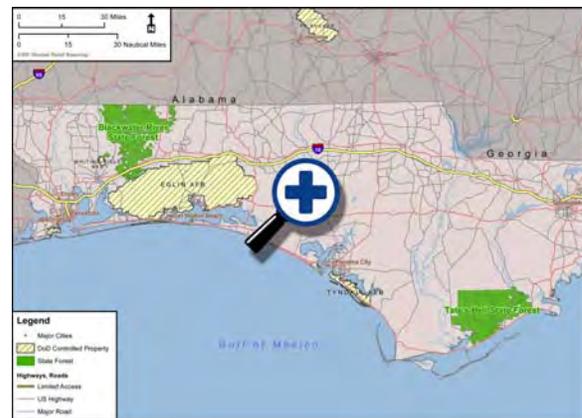


Figure 1-2. Location of BRSF and THSF

28 1.4 NEED

29 The Proposed Action is needed because there is a projected regional shortfall of military
30 training and testing land and airspace in the GRASI region. The demand for the land range
31 and use of RA over the Eglin Range Complex creates scheduling conflicts for nonhazardous
32 training. Obtaining the necessary permits to use new areas for nonhazardous training and
33 placing training emitters in remote locations would create flexibility, improving training
34 outcomes through better scheduling and reducing the competing demands on RA. Eglin
35 AFB's primary mission is test and evaluation, and training activities sometimes have a lower
36 priority. From time to time, training units are unable to obtain the necessary time on the
37 range or in the RA to complete their requirements. As a result, the Air Force needs additional
38 flexibility in the GRASI region to accommodate the increasing levels of testing and training
39 activity required by the current mission. More specifically, additional flexibility for training
40 activities outside Eglin AFB would allow test and training units to accomplish their missions
41 when time on the range or in the RA is not available.

42 As a result, the Air Force needs additional land areas in the GRASI region to accommodate the
43 increasing levels of testing and training activity required by the current mission. More

1 specifically, additional capacity for training activities outside of the Eglin Range Complex
2 would allow all testing and training units at Eglin AFB to accomplish their missions. Obtaining
3 the necessary permits to use new areas for nonhazardous training that are in proximity to
4 units currently training on Eglin's Range Complex, as well as placing training emitters in
5 additional locations, would create flexibility and reduce the demand on RA. These measures
6 would allow some mission activities a place to operate when the airspace is already being
7 used by other mission activities. Emitter sites create realistic threat scenarios for pilots and
8 more realistic training scenarios by simulating an integrated air defense system (IADS), which
9 helps with identifying and countering enemy missile or artillery threats from land or sea.

10 In summary, by gaining permitted access to the GRASI landscape (i.e., implementing the GLI),
11 military units would gain much needed flexibility when the land range and RA are not
12 available. Furthermore, they would be able to train in a realistic threat environment that
13 would resemble actual combat scenarios.

14 **1.5 DECISION TO BE MADE**

15 For purposes of this EIS, the decision to be made is whether to implement the Proposed
16 Action (create flexibility by obtaining necessary permits/leases to use emitter sites in
17 northwest Florida and conduct training activities as another permitted user of BRSF and THSF)
18 or the No Action Alternative. The decision to be made also includes how to implement
19 elements of the Proposed Action and the frequency of training activities. Implementation of
20 the No Action Alternative would mean continuing all current training activities at the Eglin
21 Range Complex using training workarounds to try to meet units' training needs to the
22 maximum extent possible. Using training workarounds are not anticipated to meet all unit
23 training requirements, particularly as the GRASI region becomes subject to greater demands.

24 **1.6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS**

25 The proposed activities addressed within this document constitute a federal action and,
26 therefore, must be assessed in accordance with NEPA, which requires federal agencies to
27 consider the environmental consequences of proposed actions in the decision-making
28 process (42 USC 4321, et seq.). The intent of NEPA is to protect, restore, or enhance the
29 environment through well-informed decisions by the federal decision maker. The Council on
30 Environmental Quality (CEQ) was established under NEPA, 42 USC 4342, et seq., to implement
31 and oversee federal policy in this process. In 1978, the CEQ issued regulations implementing
32 the NEPA process under Title 40, Code of Federal Regulations (CFR), Parts 1500–1508. The Air
33 Force EIAP for meeting CEQ requirements is accomplished via procedures set forth in CEQ
34 regulations and 32 CFR Part 989. This EIS has been prepared in accordance with NEPA and 32
35 CFR Part 989.

36 **1.6.1 Summary of Public Scoping Process**

37 NEPA and the Air Force's implementing regulations require the lead agency (in this case, the
38 Air Force) to seek public participation throughout the EIAP. "Scoping" identifies potential
39 issues and alternatives early in an EIS development process. A detailed discussion of the

1 public scoping process, as well as public scoping materials presented at meetings and
2 distributed to the public, is provided in Appendix B, *Public and Agency Involvement*.

3 The initiation of the scoping process began with the Air Force's publication of a Notice of
4 Intent (NOI) in the Federal Register on 12 August 2013. This notice announced the Air Force's
5 intent to prepare the GLI EIS. The publication of the NOI officially marked the beginning of
6 the scoping period, during which time the Air Force accepted public comments on the scope,
7 or range of issues, to be considered during the preparation of the draft EIS. The scoping
8 period ended on 12 September 2013.

9 Approximately two weeks prior to the scoping meetings, the Air Force distributed newspaper
10 advertisements in areas potentially impacted by the GLI to announce its intent to prepare an
11 EIS and the associated scoping meetings.

12 The Air Force also established a project website, <http://grasieis.leidoseemg.com>, to notify the
13 general public of the scoping meetings and EIAP via the Internet. The website also accepted
14 public scoping comments. The scoping brochure, developed for the scoping meetings, was
15 posted to the project website prior to the scoping meetings and the scoping presentation
16 was posted shortly after the scoping meetings. A project announcements tab announced the
17 scoping meeting dates and locations, as well as the close of the scoping period and informed
18 the public that the Draft EIS was anticipated to be available for public and agency review early
19 in 2014. The website also linked to the GRASI website as well as other relevant Air Force
20 websites.

21 The Air Force held three scoping meetings, near BRSF and THSF. The dates and locations for
22 those meetings are included in [Table 1-1](#), along with the number of meeting attendees, and
23 verbal and written comments received.

24 **Table 1-1. Scoping Meeting Dates, Locations, Attendance, Comment Submittals**

Date	Location	Number of Persons Signing In	Number of Written Comments Received	Number of Speakers
August 27, 2013	Milton Community Center, Gracie Room 5629 Byrom St. Milton, Florida	23	1	5
August 28, 2013	Blountstown Civic Center 17773 Ne Pear St. Blountstown, Florida	9	0	0
August 29, 2013	Apalachicola Community Center 1 Bay Ave Apalachicola, Florida	91	2	11

25 [Table 1-2](#) summarizes by resource area or EIS topic the public comments provided during the
26 public scoping period at the scoping meetings or in writing to the Air Force. The table also
27 identifies where in the EIS these issue areas are addressed.

28 Development of the comment summaries began with a review of each comment for content;
29 key issues were identified and the comments categorized by EIS topic, such as Purpose and
30 Need, Proposed Action and Alternatives, Suggested New Alternative, or resource area, such as
31 Socioeconomics, Noise, Transportation, Biological Resources, etc.

1 Many of the comments concerned more than one topic and/or resource area. These
 2 comments were categorized in all relevant actions/topics to ensure their full consideration
 3 during the EIS preparation. In addition, some commenters provided written as well verbal
 4 comments. Accordingly, the number of comments received is greater than the number of
 5 individuals and organizations commenting. For the GLI EIS, 167 individuals and organizations
 6 submitted 1,306 comments.

7 **Table 1-2. Scoping Comment Synopsis**

Category	EIS Location	Number of Comments
Airspace Management and Use	Sections 3.2/4.2/5.2/6.2	53
Air Quality	Sections 3.5/4.5/5.5/6.5	0
Biological Resources	Sections 3.8/4.8/5.8/6.8	318
Cultural Resources	Sections 3.9/4.9/5.9/6.9	3
Cumulative Impacts	Chapter 7	6
Environmental Justice	Sections 3.11/4.11/5.11/6.11	8
General	N/A	34
General Opposition (Opposed to proposed action)/No-Action Alternative should be chosen	N/A	38
General Support (In support of proposed actions)	N/A	4
Solid and Hazardous Materials/Waste	Sections 3.12/4.12/5.12/6.12	14
Infrastructure and Transportation	Sections 3.13/4.13/5.13/6.13	5
Land Use and Recreation	Sections 3.10/4.10/5.10/6.10	177
National Environmental Policy Act (NEPA)	Chapter 1	59
Noise	Sections 3.3/4.3/5.3/6.3	68
Proposed Action	Chapter 2	230
Purpose and Need	Chapter 1	12
Earth Resources (Soils)	Sections 3.6/4.6/5.6/6.6	16
Safety	Sections 3.4/4.4/5.4/6.4	36
Subsistence	Sections 3.10/4.10/5.10/6.10	23
Socioeconomics	Sections 3.11/4.11/5.11/6.11	115
Water Resources	Sections 3.7/4.7/5.7/6.7	87
	Total	1,306

8 Additionally, to further inform the public of the Proposed Action and to allow for the public to
 9 further express concerns, the Air Force held town hall meetings in Milton and Apalachicola,
 10 Florida in December 2013. The Milton meeting, held on December 11, was attended by
 11 131 persons and the Apalachicola meeting, held on December 12, was attended by 52
 12 persons.

13 **1.7 COOPERATING AGENCY AND INTERGOVERNMENTAL** 14 **COORDINATION/CONSULTATIONS**

15 There are no cooperating agencies associated with this action. This EIS has been developed
 16 by the U.S. Air Force in coordination with other DoD services and GRASI partner organizations,
 17 including the FFS and FWC.

18 In August, the Air Force distributed Interagency and Intergovernmental Coordination for
 19 Environmental Planning (IICEP) letters to potentially interested Federal, state, and local

1 agencies and government representatives. Included as an attachment to the IICEP letter was
2 a map of the proposed emitter sites and BRSF and THSF and a flyer advertising the scoping
3 meetings. The IICEP letter, attachments and distribution list are located in Appendix B, *Public*
4 *and Agency Involvement*.

5 The Air Force completed consultation with the U.S. Fish and Wildlife Service (USFWS) in
6 accordance with Section 7 of the Endangered Species Act (ESA) on April 8, 2014, and has
7 received concurrence on a finding of “Not Likely to Adversely Affect” sensitive species or
8 habitat (USFWS, 2014). The Air Force has notified the Florida State Historic Preservation
9 Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Native American tribes
10 in accordance with Section 106 of the National Historic Preservation Act (NHPA). A list of
11 agencies and tribes contacted is provided in Appendix B, *Public and Agency Involvement*, while
12 ESA and NHPA consultation documentation is provided in Appendix C, *Consultation*
13 *Documentation*. All completed NHPA consultation documents, including responses and
14 findings from cultural resource consultation agencies, will be provided in the Final EIS.

15 1.8 DOCUMENT FORMAT

16 This document consists of 13 chapters and nine appendices:

- 17 • **The Executive Summary** provides a summary of information in this EIS.
- 18 • **Chapter 1, Purpose and Need**, provides background information and identifies the
19 purpose and need for the Proposed Action.
- 20 • **Chapter 2, Description of the Proposed Action and Alternatives**, details the
21 Proposed Action and alternatives, discusses the alternative development process, and
22 summarizes the potential environmental impacts associated with the Proposed Action
23 and alternatives.
- 24 • **Chapter 3, Affected Resource Assessment**, identifies the resources potentially
25 affected by the different components of the Proposed Action, discusses regulatory
26 drivers and impact assessment methodologies associated with each resource area,
27 and provides a general analysis of impacts to each resource area resulting from
28 Proposed Action components.
- 29 • **Chapter 4, Emitter Sites Affected Environment/Environmental Consequences**,
30 provides site-specific resource inventories and impact analyses associated with use of
31 emitters under the Proposed Action.
- 32 • **Chapter 5, Blackwater River State Forest Affected Environment/Environmental**
33 **Consequences**, provides site-specific resource inventories and impact analyses of
34 potential impacts associated with proposed training activities at BRSF.
- 35 • **Chapter 6, Tate’s Hell State Forest Affected Environment/Environmental**
36 **Consequences**, provides site-specific resource inventories and impact analyses of
37 potential impacts associated with proposed training activities at THSF.
- 38 • **Chapter 7, Cumulative Impacts**, discusses the potential cumulative impacts
39 associated with the Proposed Action and past, present, and reasonably foreseeable
40 future actions at BRSF, THSF, and within a regional context.

- 1 • **Chapter 8, No Action Alternative Impact Analysis**, assesses potential impacts
2 associated with implementation of the No Action Alternative.
- 3 • **Chapter 9, Other NEPA Considerations**, discusses the relationship between short-
4 term use and long-term productivity, irreversible and irretrievable commitment of
5 resources, energy requirements and conservation potential of alternatives and
6 mitigation measures, and natural or depletable resource requirements and
7 conservation potential.
- 8 • **Chapter 10, References**
- 9 • **Chapter 11, List of Preparers**
- 10 • **Chapter 12, Index**
- 11 • **Chapter 13, Glossary**
- 12 • **Appendices**
 - 13 ○ Appendix A, Printable Maps
 - 14 ○ Appendix B, Public and Agency Involvement
 - 15 ○ Appendix C, Consultation Documentation
 - 16 ○ Appendix D, Air Quality
 - 17 ○ Appendix E, Earth Resources
 - 18 ○ Appendix F, Cultural Resources
 - 19 ○ Appendix G, NEPA Disclosure Statement
 - 20 ○ Appendix H, Noise
 - 21 ○ Appendix I, Memoranda of Agreement

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2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The Proposed Action consists of two main components: establishment and use of emitter training sites on GRASI partner lands and applying to the FFS and FWC to be a permitted user of the northwest Florida state forests for nonhazardous training activities. This Proposed Action may not provide the most comprehensive solution for all training needs, as described in Sections 1.3 and 1.4. Should other partnerships identify additional training locations, they will be considered in conjunction with the appropriate level of additional NEPA analysis. At this time, no other suitable training locations have been identified as potentially available for use and no other elements of the GLI proposal have adequate project definition to warrant inclusion in this EIS. This chapter describes the alternative development/screening process and alternatives considered but not carried forward, details the Proposed Action and No Action Alternative, and summarizes impacts to the human and natural environment associated with the Proposed Action as identified in Chapters 3 through 6.

2.2 ALTERNATIVE SCREENING PROCESS/ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The process for identifying potential locations for emitter sites and training involved three steps: (1) identifying requirements, (2) coordination with state agencies, and (3) evaluation of locations.

2.2.1 Identifying Requirements with Selection Standards

To optimize use of public lands, land considered for the GLI must consist of existing state lands that would be compatible with military training. The military use proposed as part of the initiative would not require full-time dedicated military land use nor would it warrant the public cost of funding a new military land acquisition.

Throughout 2011 and 2012, staff from the 96th Test Wing met with military operators (primarily AFSOC, the Joint Strike Fighter operators, and the 7 SFG) to identify basic requirements for conducting nonhazardous operations off the Eglin Range. User groups identified the types of training that would be potentially conducted under the Proposed Action, based on current operations on the Eglin Range and the requirements needed to conduct the training. The following requirements for training sites were identified: (a) sites must be located within a 1.5-hour drive (100 nautical miles) or 1-hour flight time (150 nautical miles) from Eglin AFB/Hurlburt Field to allow for day-trip training missions; (b) land area must be large enough to conduct DoD training events (preferably 15 square kilometers); (c) land must have available roads and infrastructure for access; (d) training sites should require minimal to no improvements; (e) area must have available aircraft landing areas that require minimal to no improvements.

1 For radar emitters (see Section [2.3.1](#)), the following requirements (in order of importance)
2 were identified: (a) must be within 2.5 to 3 hours driving distance from Eglin AFB to allow for
3 day-trip mission activity and maintenance; (b) must be at least 0.75 acre in size to
4 accommodate equipment; (c) must be accessible via improved roadways; (d) must be able to
5 accommodate adequate line of sight (LOS) (e.g., not surrounded by tall trees or utility
6 poles/wires) with minimal improvements; (e) must be able to accommodate utility,
7 communication, and security infrastructure (e.g., power, landlines/fiber optics) with minimal
8 improvements; (f) should not be in close proximity to populated areas to minimize safety
9 concerns and disturbance.

10 **2.2.2 Coordination with State Agencies**

11 After site/training requirements were identified, the Air Force met with state land owners and
12 managers, including the Northwest Florida Water Management District (NFWFMD), Florida
13 Department of Environmental Protection (FDEP), Florida Park Service, FFS, and the FWC.
14 Through an iterative process consisting of several meetings and discussions with GRASI
15 partners, the agencies identified particular state lands suitable for training areas and more
16 than 70 potential emitter training sites, which met the minimum DoD requirements for
17 training. GRASI partner sites that met the DoD training criteria included the BRSF and THSF.
18 In the future, partner organizations and locations would be considered if they are determined
19 to be capable of supporting DoD's training needs. Use of any additional areas in the future
20 would be subject to the appropriate level of additional NEPA analysis.

21 **2.2.3 Evaluation of Locations**

22 The 70 potential emitter training sites (shown in [Figure 2-1](#)) were evaluated by the Air Force
23 on a site-specific basis to determine the "best fit" based on the previously discussed emitter
24 requirements. Sites were ranked based on their compatibility with the requirements
25 identified; and these 70 sites were narrowed down to the 12 sites identified and assessed in
26 this EIS. The remaining sites were not carried forward as alternatives because they did not
27 meet one or more of the requirements.

28 With regard to nonhazardous training sites, BRSF and THSF were the only potential sites
29 identified by state agencies currently in a partnership agreement under GRASI with the Air
30 Force that met the selection standards. Both locations meet all of the identified
31 requirements, with the exception of THSF exceeding the 1.5-hour drive time from Eglin
32 AFB/Hurlburt Field. However, the location is within the 1-hour flight time, so it has been
33 carried forward as an alternative. Due to driving distance, THSF would be used infrequently
34 for ground training. [Figure 2-2](#) shows a map of lands managed by GRASI partners, as well as
35 other state and federal lands that fall within 150 nautical miles of Eglin AFB and Hurlburt
36 Field. As the map shows, the only GRASI partner lands of suitable size for training currently
37 available to support DoD's training needs are located within THSF and BRSF. No other viable
38 alternatives for auxiliary training sites were available that met the requirements identified
39 previously; thus, no other alternatives were carried forward for consideration in this EIS.



Figure 2-1. Potential Emitter Sites



Figure 2-2. Federal and State Lands Within 150-Nautical Mile Radius of Eglin AFB

1 **2.2.4 Alternatives Considered but Not Carried Forward for Full Analysis**

2 The Air Force initially considered a wide array of alternatives for supporting DoD training land
 3 and airspace needs. Alternatives that did not meet the selection standards or minimum
 4 criteria for meeting DoD mission requirements were not carried forward for analysis. These
 5 alternatives included the following:

- 6 • A) Reducing the amount of testing activity on military ranges to accommodate more
 7 training on existing DoD lands. Testing activities at the Eglin Range Complex and
 8 other DoD installations in the GRASI region are critical activities needed to determine
 9 combat effectiveness and capability of DoD systems and equipment. A reduction in
 10 testing could jeopardize the effectiveness of military weapons systems and
 11 equipment, as well as the safety and well-being of DoD military members. This
 12 alternative was, therefore, not carried forward for consideration, as it would not allow
 13 the military to fully meet its training and testing needs.
- 14 • B) Establishing partnerships with federal landowners to support the GLI. A national
 15 agreement exists between the Department of Agriculture and DoD regarding general
 16 use of national forest land for military training. However, the U.S. Forest Service (USFS)
 17 and the Air Force have not developed an agreement under the *GRASI Strategic Plan* to
 18 develop suitable training areas at this time. While this may be an option for future
 19 training proposals, it is not within the timing and scope of the current proposal. The
 20 Air Force would have to review all of the training requirements and develop a
 21 proposal designed for national forest land in light of the legal requirements applicable
 22 under all federal laws to those lands. Then it would still need to work with USFS to
 23 identify areas that might be suitable in terms of meeting appropriate selection
 24 standards tailored to all of those requirements. This process would require additional
 25 time and resources to develop a proposal that could be meaningfully evaluated. If and
 26 when the USFS and the Air Force are able to identify national forest lands that may be
 27 available for conducting nonhazardous training, such a proposal would be
 28 appropriately evaluated and considered, including a full evaluation of the potential
 29 environmental impacts.

- 1 • C) Purchasing additional dedicated DoD range lands. The purchase of new lands to
2 support the Proposed Action does not meet the purpose and need for the GLI
3 proposal. Under the GLI, the Air Force does not require a constantly available, fully
4 dedicated, exclusive military use range. The nonhazardous training requirements do
5 not justify such an acquisition, in part because there is no need for permanent
6 construction. Since this training would be compatible with other land use activity, it
7 can be conducted on the lands managed by state agencies that have developed
8 agreements under GRASI with the Air Force.

9 DoD and Air Force policy requires the Air Force to pursue a lesser interest in land
10 rather than absolute ownership (fee simple title) when the requirement for the use of
11 land would be limited in time or intermittent, as is the case with the Air Force's GLI
12 proposal (DoDI 4165.71; AFI 32-9001). Prior to pursuing any purchase of land for
13 training purposes, the Air Force would have to determine that the requirement cannot
14 be satisfied by securing permission to use state or other lands through a long-term,
15 nominal, or low-cost lease or to periodically use such lands under a license or permit.
16

17 In addition to being unnecessary, acquiring ownership of the property would be too
18 expensive. The process to acquire and establish a new military training range is
19 typically lengthy (5 to 7 years) and resource intensive. Additionally, any land areas
20 purchased would require a significant amount of overhead funding for management,
21 in terms of administration, security, and infrastructure development. To support
22 nonhazardous training that is compatible with other land use, the purchase of land for
23 a new, dedicated military range would not be an efficient use of resources, consistent
24 with the *GRASI Strategic Plan*, or cost-effective, particularly during a period of drastic
25 federal budget reductions.

- 26 • D) Develop additional GRASI partnerships and conduct training outside of the 100- to
27 150-nautical mile geographic range established by the DoD training community.
28 While there are certainly additional existing GRASI partner lands across the region that
29 could be utilized to support training, if such lands are too remote, then too much
30 training time would be lost in transit to access these areas. Time is a precious
31 commodity for military trainers. The requirement to spend more than a few hours to
32 get to and from a training area would limit the overall utility of the training location
33 and would not support the DoD training objectives to provide trained and ready
34 forces. Too much training time would be lost transporting units and equipment to the
35 training site. Additionally, the further sites are from a unit's primary basing location,
36 the higher the day-to-day operational costs to train and provide logistical support. As
37 was stated in Chapter 1, additional GRASI partnerships will be pursued. If additional
38 partnerships are established that meet the purpose and need in light of DoD selection
39 standards to implement training, then alternatives for GRASI may be developed and
40 evaluated. At this time, no other GRASI partner organizations have entered into an
41 agreement with DoD to identify suitable training areas on lands managed by such
42 organizations.
- 43 • E) The training capacity of each state forest individually, and in fact, both state forests
44 together still does not fully meet the training requirements identified as part of the
45 GRASI planning process. Therefore, while the operating flexibility of having both

1 forests helps reduce scheduling issues and provides more flexibility for conducting
 2 ground training, it still does not completely resolve the anticipated future capacity
 3 issues identified by the GRASI airspace model. Therefore, utilization of each forest as
 4 its own alternative was considered but not carried forward, because one forest alone
 5 would not support the purpose and need of the Proposed Action.

6 2.3 PROPOSED ACTION

7 2.3.1 Emitter Sites



Kineto Tracking Mount Emitter



Mobile Cinetheodolite Mount (MCM) Emitter

A component of the Proposed Action is to establish up to 12 radar, telemetry, and emitter training sites throughout northwest Florida to support development of a simulated IADS to be used for air training. Under this training scenario, aircrew would be operating in already-established military SUA, normally at high altitudes. Radar and telemetry emitters are used for tracking aircraft and navigation; training emitters are radar simulator systems designed to help train military personnel to identify and counter enemy missile or artillery threats from land or sea. The simulated IADS would utilize land, air, and sea space across the Florida panhandle, southern Alabama, and the waters of the Gulf of Mexico to provide a training venue that could be tailored to specific training scenarios. The Eglin Range simulated IADS would provide a well-designed, mutually supporting simulated training capable of providing balanced air defense coverage for detection and engagement across the northwest Florida airspace for all altitudes. One system would provide coverage for another where gaps in coverage are determined. The simulated IADS would provide a unique, viable, and robust training challenge for United States (U.S.) and coalition assets seeking to assess system and aircrew performance.

32

33

34 Types of emitters would vary depending on need, and
 35 their use would be determined by constraints associated
 36 with the site and respective operational parameters of
 37 the specific system; as an example, use of high-powered
 38 systems with large safety hazard distances (SHDs) may
 39 be restricted at sites in close proximity to populated
 40 areas. Typical radar and telemetry units would consist of
 41 Kineto Tracking Mount (KTM) and Mobile Cinetheodolite
 42 Mount (MCM) systems. Typical training emitters used
 43 would include emitters such as the joint threat emitter
 44 (JTE).



Joint Threat Emitter

- 1 Emitter training sites identified would utilize FFS and FWC lands via leasing agreements.
- 2 These sites would accommodate mobile and temporary use; mobile use means that the site
- 3 would be used for a day with operators on-site, while temporary use may last for several days.
- 4 Proposed locations are shown in [Figure 2-3](#) through [Figure 2-5](#).



Figure 2-3. Location Overview of Proposed Emitter Sites



Figure 2-4. Regional View (West) of Proposed Emitter Sites



Figure 2-5. Regional View (East) of Proposed Emitter Sites



Typical Semi-improved Emitter Site

The majority of sites identified as part of the screening process are associated with FFS fire-spotting towers, while two sites are owned by FWC and one site by Eglin AFB. All sites are either “improved” or “semi-improved.”

Most can accommodate LOS requirements without improvements; however, at two sites (FFS-8, FFS-9) some minor tree clearing/topping (less than 0.5 acres) would improve LOS.

Power generation at each site would be provided either by generator or connection to available utilities. Some sites have available fencing, while others do not and may require fencing if used as a “temporary” site. Any improvements would need to be coordinated with the land owners and identified as part of the lease agreements.

1 Not all proposed sites may be used, and only several at any one time would be operational.
 2 [Table 2-1](#) summarizes the proposed emitter locations and their associated details. In the
 3 future, additional potential emitter sites may be proposed at sites required to enhance
 4 training in support of new and emerging training requirements. Potential new sites would be
 5 evaluated in the same fashion as those identified in Section [2.2](#) and would be subject to
 6 additional NEPA analyses.

7 **Table 2-1. Summary of Emitter Types and Proposed Locations**

Site Identifier	Description	Adequate LOS	Available Utilities	Security	Proximity of Residences
FWC-1	Semi-improved, cleared area – both sites adjacent to each other.	360 degrees	Power; no water/fiber optics/telephone	Fencing required for temporary use.	N/A
FWC-2		270 degrees	Power w/in 0.5 mile; No water/fiber optics/telephone		N/A
EAFB-1	Henderson Beach location – owned and operated by Air Force.	360 degrees	Power; Water; Telephone; Fiber Optics	Security available.	Adjacent recreation area.
FFS-1	Coldwater Forestry Site (FS)– improved site with paved areas, buildings, and watch tower.	270 degrees	Power; Water; Telephone; No fiber optics		FFS Resident Staff
FFS-2	East Bay FS – improved site with paved areas, buildings, and watch tower.	270 degrees	Power; Water; Telephone; No fiber optics		FFS Resident Staff
FFS-3	Semi-improved area near Jackson Still FFS tower site.	180 degrees	Power; Water; Telephone; No fiber optics	Fencing required for temporary use.	Residence w/in 80 meters.
FFS-4	Semi-improved area near Moddy FFS tower site.	180 degrees	Power; Water; Telephone; No fiber optics		N/A
FFS-5	Molino FS – improved site with paved areas, buildings, and watch tower.	270 degrees	Power; Water; Telephone; Fiber Optics	Security available.	FFS Resident Staff
FFS-6	White City FS – improved site with paved areas, buildings, and watch tower.	180 degrees	Power; Water; Telephone; Fiber Optics		FFS Daily Staff
FFS-7	Youngstown FS – improved site with paved areas, buildings, and watch tower.	180 degrees	Power; Water; Telephone; Fiber Optics		Daily FFS and Sheriff Dpt. Staff.
FFS-8	Semi-improved area near Smith FFS tower site.	90 degrees	Power; Water; Telephone; No fiber optics	Fencing required for temporary use.	Residence w/in 51 meters.
FFS-9	Vicksburg FS – improved site with paved areas, buildings, and watch tower.	90 degrees	Power; Water; Telephone; No fiber optics	Security available.	FFS Resident Staff.

FFS = Florida Forest Service; FS = Forestry Site; LOS = line of sight

8 **2.3.2 Training Activities in Northwest Florida State Forests**

9 Training activities associated with the Proposed Action consist of utilizing existing areas
 10 cleared by the FFS as part of regular forest management activities for helicopter landing and

1 drop zones, use of existing airfields and roadways for aircraft landings, and a number of
 2 different land and air training activities. These activities currently occur in the areas between
 3 designated test/training sites on the Eglin Range and are evaluated in detail in the *Interstitial*
 4 *Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c). The Air Force
 5 proposes to create flexibility by obtaining the necessary permits and leases to use public
 6 lands when available for these activities. Specifically, two state forests in northwest Florida,
 7 BRSF and THSF, would be leased through agreements with FFS ([Figure 1-2](#)). For the purposes
 8 of this EIS, each state forest has been divided into “tactical areas” (TAs), which correlate to
 9 each state forest recreational area as shown in [Figure 2-6](#) and [Figure 2-7](#). While the FFS
 10 further segments each recreational area into smaller management units, this EIS uses the TA
 11 level to provide a cohesive, holistic overview of training and associated impacts. This
 12 information can be used for TA and management unit scheduling, as well as future planning
 13 and tiering as training locations change over time. Training activities may occur in any of the
 14 TAs, with consideration of restrictions identified via coordination with the FFS during the
 15 planning process, as well as any constraints or mitigations identified in this EIS.

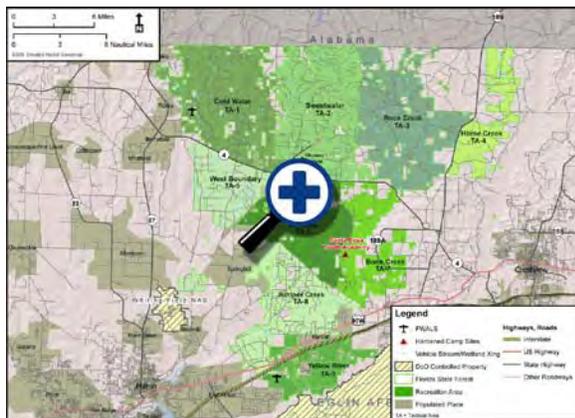


Figure 2-6. BRSF Tactical Areas

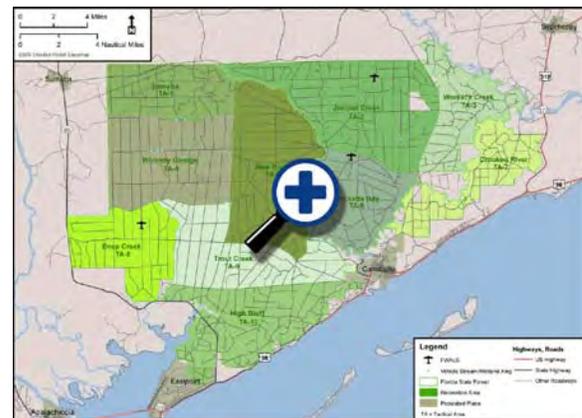


Figure 2-7. THSF Tactical Areas

16 Training in the TAs would provide flexibility for those test/training units that are unable to
 17 schedule time on the Eglin Range or in the RA due to other higher-priority activities or range
 18 congestion. As anticipated growth in military missions continues, training in the TAs could
 19 occur at frequencies described in [Table 2-2](#) through [Table 2-23](#). All training activities in the
 20 state forests would be conducted per the requirements of Eglin AFB Instruction
 21 (EAFBI) 13-212, *Range Planning and Operations*, Chapter 7 – Environmental Management
 22 (December 2010, Interim Change on 9 September 2011), as applicable, and in accordance
 23 with the respective state forest management plans. EAFBI 13-212, Chapter 7 available at
 24 <http://grasieis.leidoseemg.com/documentation.aspx>.

25 EAFBI 13-212, Chapter 7 identifies requirements for protection of natural and cultural
 26 resources and waste management. Additionally, training activities would implement, as
 27 appropriate, the terms and conditions identified in the following documents (also available at
 28 the above website):

- 29 • Eglin AFB Interstitial Range Area Biological Assessment (U.S. Air Force, 2012)
- 30 • USFWS Interstitial Range Area Biological Opinion (USFWS, 2012)
- 31 • Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion (USFWS, 2013)

1 • Eglin AFB Riverine/Estuarine Programmatic Environmental Assessment (U.S. Air Force,
2 2004)

3 • Eglin AFB Riverine/Estuarine Biological Assessment (U.S. Air Force, 2004)

4 As part of the Proposed Action, Eglin AFB would establish a Landscape Implementation Team
5 (L.I.T.) and a GLI Liaison to coordinate with the FFS in the following capacities:

6 • Developing real property leases/agreements

7 • Developing and implementing a methodology for scheduling training activities

8 • Identifying and implementing funding/reimbursement mechanisms to pay for
9 leases/agreements

10 • Identifying specific operating requirements (e.g., number and sizes of HLZs/drop
11 zones [DZs] needed for a particular year)

12 • Updating and revising training directives and safety procedures to make them
13 applicable to each GLI training site to provide the same level of protections for these
14 resources and their users as if these sites were subject to Eglin Range Complex
15 requirements

16 • Developing addendums/attachments to EAFBI 13-212 Chapter 7 for BRSF and THSF to
17 identify environmental considerations detailed in this EIS

18 • Ensuring compliance with EAFBI 13-212 Chapter 7, and appropriate environmental
19 requirements

20 All mitigations identified in the final Mitigation Plan would be incorporated into an operating
21 agreement with the FFS.

22 For all training activities, operators must adhere to respective state forest management plan
23 requirements. Such requirements include contacting the respective forest dispatch to
24 identify campground activity for avoidance of inhabited recreational areas. In addition, no
25 substantive land disturbance (e.g., land clearing, construction, digging of pits) would be
26 allowed, and personnel must collect all waste/used expendables. These requirements are
27 further detailed in Chapter 3 under the associated resource sections. Minor road
28 improvements may be made to allow for austere aircraft operations in support of Fixed-Wing
29 Aircraft Landing Sites (FWALS); however, these activities would occur in coordination with the
30 FFS and follow FFS requirements.

31 The main groups conducting training in the two state forests consist of multiple units
32 organized under the AFSOC located at Hurlburt Field and the 7 SFG(A) located at Eglin AFB.
33 Other groups may also utilize the BRSF and THSF intermittently as needed. However,
34 regardless of which groups use these areas for training, the activities, restrictions on use, and
35 associated expendables would be the same.

36 Training activities described under the Proposed Action are not mutually exclusive, and some
37 training activities would occur in support of other activities or subsequent to other training
38 activities. An example would be a training mission involving several helicopters flying from
39 Eglin AFB to a BRSF tactical area HLZ/DZ where personnel and equipment would be dropped
40 via an Airdrop (AD) or a low-level insertion/extraction. Personnel may then conduct cross-
41 country dismounted movement training to the Short-Term Offender Program (STOP) Camp or
42 another HLZ, while along the way bivouacking, conducting communications and surveillance

1 operations, and utilizing expendables. Once reaching their objective they would be extracted
2 either via another low-level insertion/extraction or cross-country vehicle movement. Aircraft
3 would use existing MOAs and controlled airspace, as is currently done, to maneuver between
4 Eglin AFB and the state forests.

5 As discussed in Sections [1.3](#) and [1.4](#), the goal of the GLI is to increase the military flexibility of
6 the region. Use of the forests would take a phased approach, the frequency of use increasing
7 gradually from minimal use up to higher use scenarios as outlined in this document as the
8 administrative procedures for scheduling, control, and monitoring are implemented and the
9 other mission activities at Eglin AFB increases. The intent for implementing GLI training
10 would be to start slowly and increase nonhazardous training utilization of THSF or BRSF to
11 acceptable levels that are compatible with and can be supported by the FFS. Training would
12 only be implemented to the extent that DoD units need the additional off-base training
13 capacity to support nonhazardous activities. It is important to remember that new lands
14 would not support full training utilization like dedicated military training ranges at Eglin AFB.
15 Because of safety limitations and existing policy, activities using live fire and duded
16 munitions would not be conducted in proposed GLI training areas. Because of these
17 limitations and increased travel times required to access BRSF and THSF, total use of THSF or
18 BRSF is anticipated to be well below the utilization rates of dedicated military ranges, which
19 are utilized up to 232 days per year. Training utilization rates would be further reduced
20 during hunting season and other times when military use would not be compatible with
21 existing land uses.

22 While training utilization projections would be well below 232 days per year, it is difficult to
23 predict just how frequently units would utilize GLI locations to support their training
24 requirements. Given this uncertainty, this EIS analysis evaluates impacts based on a
25 "maximum-use scenario" that has been developed for each training activity. Evaluation of
26 this scenario ensures that impact characterizations are conservative and do not
27 underrepresent potential impacts should there be an occasion where maximum potential use
28 would occur. Additionally, each maximum-use scenario is applied and analyzed for each
29 forest in the event that one forest is unavailable for a certain type of training due to
30 scheduling issues or other factors; this ensures that each forest is similarly treated in terms of
31 potential impact. These maximum-use scenarios are detailed in tables accompanying each
32 activity description and are based on existing Eglin AFB usage within the Eglin Range. Eglin
33 typically operates 232 days per year, accounting for holidays, weekends, etc. Numbers of
34 personnel used during training activities typically range from 10 to 50 and may involve any
35 number and type of vehicles. Personnel would travel to BRSF either by road or aircraft as part
36 of training. Because of distance (150 to 200 miles depending on route taken), road travel to
37 THSF would be infrequent, and most training activities would be associated with air transport
38 of personnel and equipment to THSF tactical areas.

39 The goal of the analyses in the EIS is to identify potential impact areas and identify constraints
40 associated with their use as related to the training activities described in this chapter. The
41 analyses identify 1) potential impacts associated with training activities, 2) areas that should
42 be avoided for certain activities, and 3) any mitigations or management requirements needed
43 to minimize adverse impacts. The user constraints and mitigations would be used for
44 planning and scheduling purposes by the L.I.T. in coordination with the FFS. Avoidance and
45 mitigation requirements would be communicated to the users prior to implementation of the
46 activity.

47 The following subsections detail proposed training activities. These activities would be
48 carried out by units of AFSOC, units of 7 SFG, F-35 Joint Strike Fighter and support units, and

1 other DoD units. Training activities discussed in this section and evaluated in the EIS would
 2 be carried out as part of either small unit training events or larger regional training exercises,
 3 such as AFSOC's Emerald Warrior training exercise. The Emerald Warrior exercise involves
 4 both fixed- and rotary-wing aircraft operations, infiltration and exfiltration of 6- to 12-man
 5 teams, airdrops, artillery targeting, and other activities that support special operations
 6 requirements. AFSOC and other joint service units may elect to conduct compatible
 7 components of these training actions on THSF or BRSF as part of the GLI Proposed Action.

8 **2.3.2.1 Helicopter Landing Zones/Drop Zones**



18 **Typical HLZ/DZ**

Existing cleared areas within the state forests would be utilized as landing sites for helicopters and DZs for personnel and equipment from various aircraft (either fixed or rotary wing). Landing and drop activities would occur as part of the training activities discussed later in this chapter. HLZs are cleared areas that vary in size depending on the number and type of aircraft being used; a single CV-22 (Osprey) would need about an acre, while two CH-47s would need about 2.75 acres.

19 DZs can be as small as a semicleared 0.3-acre opening
 20 or much larger, depending on the quantities/sizes of personnel and equipment being
 21 dropped. Both HLZs and DZs must be free of commonly used infrastructure (e.g., telephone
 22 poles, electrical lines). Several sites located throughout the state forests may be established
 23 and utilized at any one time. It is important to note that these sites would be open areas that
 24 have already been cleared of tall vegetation by the FFS through regular forest management
 25 activities; no additional land clearing would be necessary for the purpose of the GLI Proposed
 26 Action. While there may be a need for gravel surfaces for vehicle parking, no land
 27 development or other improvements would be required by the Air Force. For the most part,
 28 HLZ/DZ locations may change over time based on open area availability and training needs
 29 and would likely change from year to year through coordination and planning with the FFS.
 30 In contrast, three "permanent" HLZs/DZs would be established near the hardened camp sites
 31 at BRSF. These particular HLZs/DZs would, similarly, not require any additional land clearing
 32 or improvements. These locations are discussed in Section [2.3.2.21](#). [Table 2-2](#) lists details of
 33 HLZ/DZ activities.

34 **Table 2-2. HLZ/DZ Details**

Vehicles/Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
Construction Equipment ¹	Varies depending on size and location of HLZ/DZ.				Only utilize locations previously cleared by the FFS as part of regular forest activities. No land disturbance in wetlands or floodplains; no new impervious surfaces.

HLZ = helicopter landing zone; DZ = drop zone; FFS = Florida Forest Service

1. Establishment, operations, and maintenance as part of regular FFS activities.

2.3.2.2 Fixed-Wing Aircraft Landing Sites

FWALS involves the use of existing airstrips and dirt roadways for fixed-wing aircraft landings, takeoffs, and touchdowns in support of training activities.

Proposed locations for aircraft operations on BRSF and THSF are shown in [Figure 2-8](#) through [Figure 2-13](#), respectively.

At BRSF, one existing airfield would be utilized (Munson Airfield, which is currently designated for public use with no restrictions), and two dirt roadways (one in TA-1 and one in TA-9) are proposed for aircraft operations.

At THSF, three dirt roadways are proposed for FWALS in support of aircraft operations. These roadways are located in TA-2, -6, and -8.

Aircraft landing activities would be conducted on existing cleared roadways of suitable slope and grade for aircraft landing. Minimal construction would be needed to improve such sites, and construction would mainly include grading, widening, and vegetation clearance to support operations. The roadway landing sites would need to be approximately 30 feet wide by 2,000 feet long. There are two lateral clearance zones associated with each landing site, and the zones run the length of the landing area. Zone A, which is a graded area (e.g., road shoulder), is 30.5 feet wide and must have no obstacles (e.g., trees and shrubs) higher than 3 feet. Zone B is a 6-foot-wide "maintained area" adjacent to Zone A and must have obstacles no higher than 5 feet.

Following improvement of the sites, some maintenance activity would be necessary to grade roads and trim and maintain vegetation. This may be accomplished as part of regular forest road management activities.

Road improvements such as widening or compacting may be necessary at each location; the details of these improvements have not yet been identified. Road widening would be limited to existing shoulder areas and would not involve direct physical impacts to wetlands or surface waters. There would be no paving or addition of impervious surface at any of the proposed landing sites. Any needed improvements would be coordinated with the FFS; such

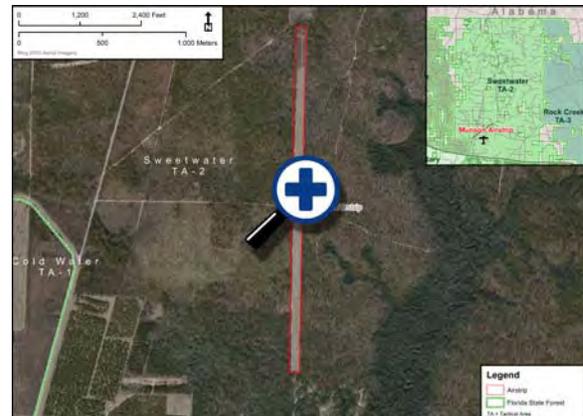


Figure 2-8. BRSF TA-2 (Munson) Airstrip



Figure 2-9. Proposed BRSF TA-1 FWALS



Figure 2-10. Proposed BRSF TA-9 FWALS

- 1 improvements may not be approved or may require supplemental environmental impact
- 2 analysis.



Figure 2-11. Proposed THSF TA-2 FWALS

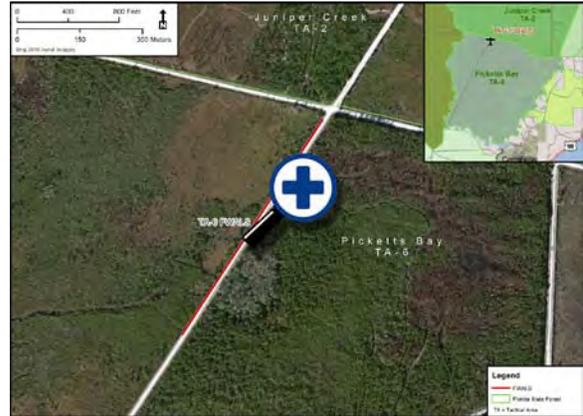


Figure 2-12. Proposed THSF TA-6 FWALS

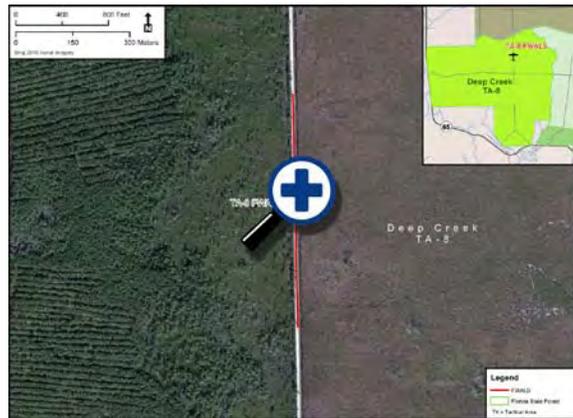


Figure 2-13. Proposed THSF TA-8 FWALS

- 3
- 4 Unlike the HLZs/DZs, which may change location over time, the operational locations would
- 5 not change in the near future. Should these locations change in the future, additional NEPA
- 6 analysis may be required. [Table 2-3](#) lists details of FWALS.

Table 2-3. FWALS Details

Vehicles/Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
Construction Equipment ¹	Varies depending on size and location of landing site.				Only utilize locations previously approved by the FFS. No land disturbance in wetlands or floodplains; no new impervious surfaces.

FWALS = Fixed-Wing Aircraft Landing Sites; FFS = Florida Forest Service

1. Establishment, operations, and maintenance as part of regular FFS activities.

1 **2.3.2.3 Use of Expendables**

2 Use of Expendables (UoEX) involves use of various
 3 training munitions and pyrotechnics during training
 4 activities. At BRSF, noise-generating expendables
 5 (e.g., blanks) would only be used at hardened camp
 6 site locations (discussed in Section [2.3.2.21](#)).
 7 Simulated munitions (consisting of plastic pellets or
 8 paintballs, which produce little or no noise) and
 9 smoke grenades may be used during training
 10 activities described in this chapter in approved areas
 11 as discussed in Section [2.5](#). At THSF, use of noise-
 12 generating expendables could be used in approved
 13 areas as identified in Section [2.5](#).

14 Exact quantities of expendables per training activity
 15 are unavailable. However, the average annual total
 16 quantity of expendables used on the Eglin Range in
 17 interstitial areas was identified in the *Interstitial Area*
 18 *Range Final Environmental Assessment Revision 2*
 19 (U.S. Air Force, 2013c). That quantity was used as an
 20 estimated annual average number of expendables
 21 potentially used under the Proposed Action. This
 22 would conform to the maximum-use scenario as discussed previously; actual numbers of
 23 expendables would likely be considerably less, since the state forest areas would only be used
 24 as needed.

25 Using the Eglin Range interstitial area expendable amounts, an estimate of expendables has
 26 been determined for a single training event based on the number of training events utilizing
 27 expendables and associated potential frequency of occurrence; however, expendables may
 28 not be used during every event. The overall total number of expendables, regardless of how
 29 many events occur in a year, would not exceed the estimated annual quantity. [Table 2-4](#) lists
 30 details of UoEX activities.



Smoke Grenade



Use of Blanks

Table 2-4. UoEX Details

Expendable Type	Estimated Maximum Quantity Per Year	Estimated Average Per Event	Restrictions
5.56-millimeter blank	576,000	~10,000	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Police brass/expendable waste, avoid public use areas when using blanks.
7.62-millimeter blank	196,200	~8,000	
Ground burst simulators	5,172	~2 to 5	
M-18 smoke grenades	4,038	~2 to 5	
Paintballs/plastic pellets	50,000	~5,000	
Flares	Emergency use only – not associated with training activities		At Blackwater River State Forest, noise-generating expendable use only at hardened camp sites.

2.3.2.4 Light Aviation Proficiency Training

Light aviation proficiency training (LAPT) involves use of established FWALS identified previously for fixed-wing aircraft takeoff and landing training. Aircraft would fly from the surface to approximately 3,000 feet above ground level (AGL) 90 percent of the time and up to 10,000 feet AGL the remaining 10 percent of the time based on training requirements. [Table 2-5](#) lists details of LAPT activities.

Table 2-5. Light Aviation Proficiency Training (LAPT) Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
One aircraft per event, combination of Casa-212, PC-12, C-145	N/A	Paintballs/plastic pellets, M-18 smoke grenades	2 hours Day and night	5 times/day 232 days/year (spread out among landing sites)	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of noise impacts to private landowners and inhabited recreational sites during approach and departure.

2.3.2.5 Low-Level Helicopter Insertions/Extractions

Low-level Helicopter Insertions/Extractions (LLHI/E) involve flying helicopters near treetop level and above to an HLZ/DZ and inserting or extracting personnel. Insertion/extraction of personnel is conducted via fast rope, rappel, ladder, hoist or other means.

Aircraft would fly at between just above the surface to 3,000 feet AGL. [Table 2-6](#) lists details of LLHI/E activities.



LLHI/E Activity

Table 2-6. LLHI/E Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of UH-60, CH-47, MH-47 There would be no more than 2 CV-22s used per event.	Up to 50 inserted/extracted	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	2 hours Day and night	2 times/month (spread out among HLZs/DZs)	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of inhabited recreational sites.

DZ = drop zone; GBS = ground burst simulator; HLZ = helicopter landing zone; mm = millimeter; LAPT = Light Aviation Proficiency Training; THSF = Tate's Hell State Forest

1 En route to HLZs/DZs, helicopters would fly at 100 to 500 AGL and 110 to 120 knots indicated
 2 airspeed (KIAS). Each helicopter would spend between 30 minutes and 2 hours conducting
 3 training activities before returning to the base. About 50 percent of the aircraft's time is spent
 4 flying patterns: 40 percent of that time consists of circling or other pattern work within an
 5 approximately 1-mile radius of the HLZ; 10 percent of the time is spent running
 6 upwind/downwind patterns or other pattern work within a 2-mile radius of the HLZ.

7 The remaining 50 percent of the aircraft's time is spent at the HLZ. About 80 percent of this
 8 time, the aircraft hovers (stationary) at different altitudes depending on the training activity
 9 for personnel: 75 feet AGL for practicing hover or rappel activities from the aircraft, between
 10 45 and 35 feet AGL for fast ropes, and at 15 feet AGL for rope ladders. The remaining
 11 20 percent of time at the HLZ, the aircraft is stationary on the ground with engines running
 12 and rotors turning.

13 Night operations make up about 50 percent of total sorties, with approximately 20 percent
 14 occurring after 10:00 pm. There is typically no flying on weekends or holidays.

15 **2.3.2.6 Temporary Combat Support Areas**



TCSA Activity

25

Temporary Combat Support Areas (TCSAs) involve set up of logistical and medical tents and equipment around HLZs/DZs and FWALS in support of training activities. Activities include loading/unloading of supplies, set up of tents and other equipment, and providing logistics support and medical treatment of simulated casualties. This may also include use of temporary defensive positions (e.g., sandbag bunkers); digging of foxholes or latrines would not occur. [Table 2-7](#) lists details of TCSA activities.

26

Table 2-7. TCSA Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
May arrive at location via various aircraft or land vehicles	Up to 50	Paintballs/plastic pellets, M-18 smoke grenades, tents, generators THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day and night	5 times/month	During hunting season night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of inhabited recreational sites.

GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

1 2.3.2.7 Airdrops

2 Airdrops (ADs) involve the insertion and/or resupply of personnel via
 3 release of troops or equipment over land-based DZs or over water.
 4 This activity would be in support of training activities. Aircraft would
 5 fly at 1,250 feet AGL for static line drops and up to 25,000 feet AGL
 6 for free fall drops depending on personnel and equipment



Static Line Personnel Drop



Airdrop Bundle

type/requirements. [Table 2-8](#) lists details of AD activities. During an AD, the aircraft typically makes first contact at the DZ, flying between 500 to 1,000 feet AGL, conducts the drop, and then moves to orbit at 5,000 feet AGL, typically offset from the DZ by about 5 to 10 miles with run-in typically at 130 KIAS. [Table 2-9](#) summarizes the minimum DZ size for type of AD.

15

Table 2-8. Airdrop Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of UH-60, CH-47, C-130, C-17, C-145; CV-22 There would be no more than 2 CV-22s used per event.	Up to 72 depending on associated training activity and aircraft.	Land drops: approximately 15 cubic foot container of water (~300 pounds); containerized delivery system (~500 pounds); paintballs/plastic pellets, M-18 smoke grenades Water drops: 2 Zodiacs	24 hours Day and night	4 times/day 232days/year (spread out among HLZs/DZs) C-17 used 2-3 times/year	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoid inhabited recreational sites and public boaters. No power motors in Bear Lake (BRSF). Avoidance of noise impacts to private landowners and inhabited recreational sites during approach and departure.

BRSF = Blackwater River State Forest; DZ = drop zone; HLZ = helicopter landing zone

16

Table 2-9. Minimum DZ Size for Airdrop Type

Airdrop	Type	Width	Length
Personnel airdrop	Static line (low)	600 yards	600 yards
		This is for one jumper. Add 75 yards to the trailing edge depending on number of jumpers leaving the airplane.	
	Military free fall (high)	Determined by jumpmaster based on team proficiency. Could be as small as a 50-yard radius circle (tactical DZ).	
Simulated airdrop training bundle (sandbag)	SATB (low)	As small as a 300-yard radius circle.	
	Free fall delivery (very low)	400 feet	400 feet
		The rule of thumb is minimum DZ for this type is equal to delivery altitude plus a 200-foot safety margin (200-foot AGL drop + 200-foot safety = 400 feet).	

AGL = above ground level; DZ = drop zone; SATB = simulated airdrop training bundle

1 **2.3.2.8 Air/Land Vertical Lift**

2 Air/Land Vertical Lift (A/LVL) involves the insertion and/or
 3 resupply of personnel and/or equipment via landing an
 4 aircraft directly into an HLZ or on an FWALS. This activity
 5 would be in support of training activities. Aircraft would fly
 6 from the surface to approximately 3,000 feet AGL 90 percent
 7 of the time and up to 10,000 feet AGL the remaining
 8 10 percent of the time based on training requirements.
 9 [Table 2-10](#) lists details of A/LVL activities.



A/LVL Activity

10 **Table 2-10. A/LVL Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of CV-22, UH-60, CH-47, C-130, C-145. There would be no more than 2 CV-22s used per event.	Up to 72 depending on associated training activity and aircraft.	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	4x/day 232 days/year (spread out among HLZs/DZs/FWALS)	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of noise impacts to private landowners and inhabited recreational sites during approach and departure.

DZ = drop zone; GBS = ground burst simulator; HLZ = helicopter landing zone; mm = millimeter; THSF = Tate’s Hell State Forest; FWALS = Fixed-Wing Aircraft Landing Sites

11 **2.3.2.9 Forward Air Refueling Point/Hot Gas Operations**



FARP/HGO Activity

Forward Air Refueling Point/Hot Gas Operations (FARP/HGO) involves the transfer of fuel during refueling operations from aircraft to aircraft or refueling truck to aircraft with aircraft engines running. Depending on mission need, fuel transport vehicles may range in capacity from several hundred gallons (fuel bowser/trailer) to several thousand gallons (heavy expanded mobility tactical truck) and would travel between the site and Eglin AFB. [Table 2-11](#) lists details of FARP/HGO activities.

1

Table 2-11. FARP/HGO Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of CV-22, UH-60, CH-47, C-130 There would be no more than 2 CV-22s used per event. Fuel trucks (250 to 2,500 gallons)	4-8 personnel	None	24 hours Day or night	2 times/year	May only occur on hardened surfaces (i.e., concrete or asphalt).

2 It is not likely that this activity would occur at BRSF because it is so close to Eglin AFB.
 3 Additionally, EAFBI 13-212 (Chapter 8) requires this activity only be conducted on hardened
 4 surfaces and there would be no hardened surface development at either forest. This activity
 5 will likely only occur at local airports in the vicinity of the forests. FARP/HGO activity is
 6 included in the EIS, as the Air Force might need to conduct this activity at BRSF under
 7 emergency circumstances. The Air Force currently conducts these activities on Eglin airfields
 8 and at other airports local to THSF.

9 2.3.2.10 Cross-Country Dismounted Movements

**CCDM Activity**

18

Cross-Country Dismounted Movements (CCDMs) involve the movement of operators (i.e., personnel) on foot across land areas from one location to another as part of simulated assault and reconnaissance training activities. CCDM may occur on or off roads or on unimproved trails. CCDM may also include crossing of streams and wetland areas. [Table 2-12](#) lists details of CCDM activities.

19

Table 2-12. CCDM Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
None	Up to 72 depending on associated training activity	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	2 times/quarter	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoid inhabited recreational sites.

GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

1 **2.3.2.11 Cross-Country Vehicle Movement**



CCVM Activity

Cross-Country Vehicle Movement (CCVM) involves the movement of personnel transport vehicles (ranging from high-mobility multipurpose wheeled vehicles [HMMWVs] to 2.5-ton trucks) and all-terrain vehicles (ATVs) across established roads from one location to another in support of resupply, logistics, and troop transport. CCVM will utilize established roadways and associated easements. [Table 2-13](#) lists details of CCVM activities.

11 **Table 2-13. CCVM Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, 2.5-ton trucks, motorcycles, minibikes, lightweight tactical ATVs	Up to 5/vehicle Up to 10 vehicles	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	3 times/quarter	Vehicles are restricted to forest roads, designated roads only. During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise.

ATV = all-terrain vehicle; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate’s Hell State Forest

12 **2.3.2.12 Vehicle Stream and Wetland Crossing**

13 Vehicle stream and wetland crossing (VSWC) involves
 14 fording of intermittent and perennial streams and
 15 wetlands by military vehicles at crossing points
 16 currently established and utilized by the FFS (identified
 17 in [Figure 2-6](#) and [Figure 2-7](#)). [Table 2-14](#) lists details
 18 of VSWC activities.



VSWC Activity

19 **Table 2-14. VSWC Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, 2.5-ton trucks, motorcycles, minibikes, lightweight tactical ATVs (quad runners)	Up to 5/vehicle Up to 10 vehicles	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours Day or night	3 times/quarter	Designated roads only at designated stream crossings.

ATV = all-terrain vehicle; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate’s Hell State Forest

1 **2.3.2.13 Blackout Driving**

2 Blackout Driving (BD) involves nighttime driving of ATV-type vehicles and HMMWVs without
 3 full headlights. Headlights would be diminished to “cat eyes,” which are essentially small slits
 4 placed over the headlights; this provides enough light to utilize night vision goggles (NVGs)
 5 while driving. Roads used for this activity would be temporarily closed (likely in concert with
 6 emplacement of obstacles) to the public to prevent safety mishaps. [Table 2-15](#) lists details of
 7 BD activities.

8 **Table 2-15. Blackout Driving Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Motorcycles, lightweight tactical ATVs (quad runners), HMMWVs	Up to 5/vehicle Up to 10 vehicles	None	8 hours	3 times/quarter	Only on closed/designated roads, thus no public conflict.

ATV = all-terrain vehicle; HMMWV = high-mobility multipurpose wheeled vehicle

9 **2.3.2.14 Emplacement of Obstacles**

10 Emplacement of Obstacles (EoO) involves placement of
 11 concertina wire along unpaved roads and Hardened Camp
 12 Sites (discussed in Section [2.3.2.21](#)). The ground surface may
 13 be slightly disturbed (within 6 inches of ground surface) from
 14 placement of stakes and pickets. All wire, stakes and/or
 15 pickets will be recovered at completion of the training
 16 exercise. [Table 2-16](#) provides details of EoO activities.



EoO Activity

17 **Table 2-16. EoO Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
N/A	N/A	Concertina wire and barbed wire Stakes/pickets	Length of associated training exercise Day or night	10 times/ year	Removal of all obstacles after exercise. During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise.

1 **2.3.2.15 Bivouacking/ Assembly Areas**



B/AA Activity

Bivouacking/Assembly Areas (B/AA) involves the use of an area, mainly tented, where troops eat and rest overnight in support of training activities. There may be slight surface ground disturbance (within 6 inches of ground surface) from placement of tent stakes and pickets. All expendables/equipment would be recovered prior to leaving the site. [Table 2-17](#) lists details of B/AA activities.

9 **Table 2-17. B/AA Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Three ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Tents and other supplies. Stakes/pickets	Length of associated training exercise. Day or night	10 times/year	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise.

ATV = all-terrain vehicle

10 **2.3.2.16 Communications and Surveillance Operations**

11 Communications and Surveillance Operations (C&SO) involve the use of sites to coordinate
 12 communications and/or conduct surveillance of “enemy forces” in support of training
 13 activities. The ground surface may be slightly disturbed from placement of tent stakes and
 14 pickets. [Table 2-18](#) lists details of C&SO activities.

15 **Table 2-18. C&SO Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, rental vehicles (trucks), ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Communication equipment, radio antennas, tents, radar equipment, camouflage nets, generators	Length of associated training exercise Day or night	Monthly	During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoidance of inhabited recreational sites.

ATV = all-terrain vehicle; HMMWV = high-mobility multipurpose wheeled vehicle

1 2.3.2.17 Amphibious Operations

2 Amphibious operations involve boat operations on the water,
3 loading/unloading of personnel to and from boats, and
4 movement in streams, rivers, and lakes as part of
5 egress/ingress operations. [Table 2-19](#) lists details of
6 amphibious operations activities.



AO Activity

7 **Table 2-19. Amphibious Operations Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to six various inflatable and rigid powered watercraft per event; engines 35 to 200 hp. Watercraft may consist of Zodiacs and aluminum boats up to 28 feet with or without outboard motors.	Up to 6/watercraft	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	12 hours Day and night	10 times/year	Avoid inhabited recreational sites and public boaters. No power motors in Bear Lake (BRSF).

BRSF = Blackwater River State Forest; hp = horsepower; mm = millimeter; THSF = Tate's Hell State Forest

8 2.3.2.18 Natural Resource Consumption

9 Natural Resource Consumption (NRC) involves the procurement of natural food sources, such
10 as small game and rodents (utilizing survival techniques such as trapping/snaring) and eating
11 of vegetation. Locations of avoidance areas (e.g., sensitive habitat areas and species) would
12 be communicated to participants prior to implementation of the activity. [Table 2-20](#) provides
13 details of NRC activities.

14 **Table 2-20. NRC Details per Event**

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
N/A	20 (10 teams at 2/team)	Paintballs/plastic pellets, M-18 smoke grenades THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	7 days Day and night	2 times/quarter	Avoid protected wildlife and plants.

GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

1 2.3.2.19 Overwater Hoist Operations



OHO Activity

8

Overwater hoist operations (OHO) involves hoist rescue and recovery of personnel and watercraft over water. Aircraft would conduct operations from just above the surface of the water to a height of about 150 feet. Aircraft would hover about 10 feet over the surface for drops and about 80 feet above the surface for retrievals. [Table 2-21](#) lists details of OHO activities.

9

Table 2-21. OHO Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Watercraft (see Table 2-19)	Up to 6/watercraft, including one safety swimmer, coxswain, medic, and assistant coxswain	Paintballs/plastic pellets, M-18 smoke grenades	4 to 6 hours	1/month	No power motors in Bear Lake (BRSF). Avoid fishermen and boaters.
Four total aircraft, combination of CV-22, HH-60, CH-47		THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	Day and night		
There would be no more than 2 CV-22s used per event.					

BRSF = Blackwater River State Forest; GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

10 2.3.2.20 Opposing Forces Vehicle Operations

11 During opposing forces vehicle operations (OFVO), two teams (one "Red," the other "Blue")
 12 compete to locate each other on established roads in a simulated urban environment.
 13 Personnel may exit vehicles to conduct "search activities." Aircraft may be used as a "spotter"
 14 to direct one of the teams; the aircraft would fly at between 16,000 and 23,000 feet AGL.
 15 [Table 2-22](#) lists details of OFVO activities.

16

Table 2-22. OFVO Details per Event

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWV	Up to 5/vehicle	M-18 smoke grenades	Day and night	5 times/week	Vehicles are restricted to forest roads, designated roads only. During hunting season, night operations only from 2 hours after sunset to 2 hours before sunrise. Avoid inhabited recreational sites.
Cessna 172 aircraft	Up to 10 vehicles	THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs			

GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate's Hell State Forest

1 2.3.2.21 Hardened Camp Site Use

2 Hardened Camp Site Use (HCSU) involves use of
 3 two hardened camp facilities located at BRSF
 4 (Figure 2-14, Figure 2-15). Both camps were
 5 established by the Florida State Department of
 6 Juvenile Justice (DJJ); one is identified as the
 7 STOP Camp, the other is the Santa Rosa Youth
 8 Academy (SRYA). The STOP Camp was leased
 9 by the DJJ from FFS and returned after the
 10 program was shut down. The DJJ vacated its
 11 lease of the SRYA in the summer of 2013.

12 These sites consist of buildings (classrooms,
 13 administrative buildings, dormitories, dining
 14 facilities, and assembly areas) and
 15 infrastructure, such as utilities and roadways,
 16 and may be used as insertion/extraction points,
 17 HLZs/DZs, command and control centers,
 18 training areas for combat in urban environment
 19 training, or other training activity support
 20 (Table 2-23).



Figure 2-14. BRSF STOP Camp



Figure 2-15. BRSF SRYA Camp

21 Table 2-23. HCSU Details per Event (BRSF)

Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Aircraft: CV-22, HH-60, CH-47 There would be no more than 2 CV-22s used per event. Vehicles: ATV-types HMMWVs	Up to 50	5.56-mm blanks, 7.62-mm blanks, GBSSs, paintballs/plastic pellets, M-18 smoke grenades; simunitions	24 hours Day and night	5 times/week 232 days/year	Upkeep and maintenance of facility.

ATV = all-terrain vehicle; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter

22 2.4 NO ACTION ALTERNATIVE

23 Under the No Action Alternative, the training activities identified under the Proposed Action
 24 would continue to occur on Eglin AFB as described and assessed in the *Interstitial Area Range*
 25 *Final Environmental Assessment Revision 2* and *Eglin AFB Riverine/Estuarine Environmental*
 26 *Assessment*; BRSF and THSF would not be utilized, and no new emitter sites would be used.

1 The No Action Alternative would not meet the purpose and need for the Proposed Action, in
 2 that there would be continued stress on the Eglin AFB user environment due to conflicts with
 3 hazardous and nonhazardous training activities. As use of the Eglin Range increases, these
 4 conflicts would become more frequent and problematic. Activities at BRSF, THSF, and the
 5 various proposed emitter sites would continue as described in the respective state forest
 6 management plans.

7 **2.5 GENERAL OPERATIONAL CONSTRAINTS**

8 In the context of this document, General Operational Constraints are actions inherent to the
 9 Proposed Action (and therefore not technically mitigations), and Proposed Resource-Specific
 10 Mitigations are those identified through impact analysis within this EIS to minimize potentially
 11 adverse impacts. Proposed Resource-Specific Mitigations are discussed in Section [2.7](#).

12 All training activities in the state forests would be conducted, as applicable, per the
 13 requirements of EAFBI 13-212 (Chapter 7, Environmental Management), in accordance with
 14 the respective state forest management plans and, as appropriate, the terms and conditions
 15 identified in the *GRASI Landscape Initiative Biological Assessment* (included in Appendix C),
 16 *Interstitial Area Range Final Environmental Assessment Revision 2*, the *Interstitial Area Biological*
 17 *Assessment*, *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion*, and the
 18 *Eglin AFB Riverine/Estuarine Biological Assessment*. Each of these documents is available for
 19 reference at <http://grasieis.leidoseemg.com/documentation.aspx>.

20 Documentation resulting from consultation with the Florida SHPO and the USFWS regarding
 21 this Proposed Action is provided in Appendix C, *Consultation Documentation*.

22 As discussed previously, all the activities under the Proposed Action currently occur on the
 23 Eglin Range, and have been evaluated under the documents mentioned previously. In order
 24 to ensure that all General Operational Constraints are identified and adhered to by training
 25 units, Eglin AFB's environmental management program has developed "Protection Levels" for
 26 areas on the Eglin Range that are utilized for ground training activities; these use levels are
 27 based on General Operational Constraints and are integral to environmental resource
 28 protection. Under the Proposed Action, the Air Force would utilize a similar system tailored
 29 for BRSF and THSF; use levels for the Proposed Action are described in [Table 2-24](#) and are
 30 applicable to all training locations within the boundaries of the state forests. Activity outside
 31 the boundaries of the state forests is limited to use of public roadways for transportation.

32 **Table 2-24. General Protection Levels for Proposed Action Ground Operations**

Protection Level	Restrictions	Area Covered
Prohibited	No access is permitted.	Camp/recreational sites, any cultural resource "prohibited areas," piping plover critical habitat (THSF)
Restricted	All activities must remain on roadbeds of established roads, including troop movements, vehicle operations, digging, and any type of ground surface disturbance. No refueling of vehicles or aircraft allowed.	1,500 feet around flatwoods salamander habitat; apiaries; sensitive species point locations and associated FNAI sensitive habitats: pitcher plant bogs, rare plants, rare animals, invasive species

Table 2–24. General Protection Levels for Proposed Action Ground Operations, Cont'd

Protection Level	Restrictions	Area Covered
RCW Buffer	Follow <i>Management Guidelines for the Red-Cockaded Woodpecker on Army Installations</i> (U.S. Army, 2007) and <i>Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion</i> (U.S. Air Force, 2013), Table 4-2.	200-foot buffer around RCW cavity trees for ground operations
Bald Eagle Nest Buffer	During nesting season (October 1 to May 15), follow <i>National Bald Eagle Management Guidelines</i> (USFWS, 2007)	1,000-foot buffer around nest for aircraft operations; 330-foot buffer for ground training operations. Currently there are no GIS data for eagle nests at either forest. However, should nest be identified, these protections would be applied.
Wood Stork Habitat Buffer	Follow <i>Habitat Management Guidelines for the Wood Stork in the Southeast Region</i> (USFWS, 1990).	500-foot buffer around wood stork feeding/roosting habitat. Currently there are no GIS data for habitat at either forest. However, should habitat be identified these protections would be applied.
Limited Use-1 (LU-1)	<u>Approved Activities:</u> use of star cluster pyrotechnics (hand-held slap flares) only for emergency purposes; use of non-lethal small arms ammunition such as blanks and paintballs (at BRSF approved for paintballs only) – see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver and incidental and consumptive land disturbance. <u>Not Approved:</u> use of smokes, flares, or simulators; off-road vehicle use – all vehicles must remain on established roads; land development and point land disturbance outside of previously disturbed roadbeds and road shoulders. LZ/DZ use except on approved FFS sites not requiring additional land development – see Noise Protection Levels Map for further restrictions on LZ/DZ use. No refueling of vehicles or aircraft allowed.	100 feet around wetlands, water bodies and floodplains; areas exhibiting very limiting soil characteristics (e.g., susceptible to erosion) for HLZ and/or bivouacking; cultural resource areas with inadequate surveys and/or “not cleared” areas; Tate’s Hell Camp Gordon Johnson Historic District
Limited Use-2 (LU-2)	<u>Approved Activities:</u> use of pyrotechnics (e.g., smoke grenades and GBSs) and non-lethal small arms ammunition such as blanks and paintballs (at BRSF approved for smoke grenades and paintballs only, with GBSs permitted only at hardened camp sites) – see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver. Incidental, point, and consumptive land disturbance (includes catholes) outside of previously disturbed roadbeds and road shoulders if approved by FFS. LZ/DZ use only on approved FFS sites with FFS coordination required for any additional land disturbance – see Noise Protection Levels Map for further restrictions on LZ/DZ use. Refueling of vehicles or aircraft allowed only on asphalt or concrete surfaces. <u>Not Approved:</u> off-road vehicle use – all vehicles must remain on established roads.	All areas not covered by other protection levels

BRSF = Blackwater River State Forest; DZ = drop zone; FFS = Florida Forest Service; FNAI = Florida Natural Areas Inventory; GBS = ground burst simulator; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative; HLZ= helicopter landing zone; LU-1 = Limited Use-1; LU-2 = Limited Use-2; LZ = landing zone; RCW = red-cockaded woodpecker; THSF = Tate’s Hell State Forest

1 As stated previously, General Operational Constraints are inherent to the Proposed Action, in
2 that they are considered components of the Proposed Action's implementation. As an
3 example, a 200-foot activity buffer around identified red-cockaded woodpecker (RCW) cavity
4 trees is a requirement of EAFBI 13-212. Just as CCDM at BRSF and THSF is a component of the
5 Proposed Action, so too is the requirement to maintain a 200-foot activity buffer around RCW
6 trees at either BRSF or THSF since EAFBI 13-212 would be a component of the Proposed
7 Action. Impact analysis in this EIS considers these requirements as part of the initial impact
8 assessment. Thus, analysis of impacts to the RCW considers the implementation of the 200-
9 foot activity buffer in the initial impact assessment; if potentially adverse impacts are
10 identified, then Proposed Resource-Specific Mitigations were developed to minimize or avoid
11 this potential.

12 Summarized below are the General Operation Constraints that would be implemented as part
13 of the Proposed Action.

14 ***General Operational Constraints***

15 All training activities are required to stay within the defined boundaries of the respective state
16 forests. Ground activity outside the forest boundaries (e.g., adjacent land parcels, inholdings)
17 is limited to transportation on public roadways.

18 Prior to implementation of the Proposed Action, the Air Force will:

- 19 1) Develop a Mitigation Plan identifying Proposed Resource-Specific Mitigations to be
20 implemented, responsible parties for mitigation implementation and compliance
21 evaluation, and monitoring mechanisms for evaluation of mitigation effectiveness.
- 22 2) Establish an L.I.T. composed of appropriate Eglin agencies and disciplines to coordinate
23 with apposite Eglin agencies and the FFS. The L.I.T. will provide oversight to ensure the
24 following requirements are implemented and the required supporting processes are
25 established for implementation prior to performing any missions identified in the GLI on
26 identified state forest lands:
 - 27 a) Develop real property leases/agreements that incorporate the operational constraints
28 and mitigations identified in this EIS.
 - 29 b) Develop and implement a methodology for scheduling training activities, through
30 existing Eglin organizations, that incorporates operational constraints and mitigations
31 identified in this EIS and addresses any violations of the mitigation plan, including
32 enforcement.
 - 33 c) Develop and implement a methodology to identify specific training areas and
34 corridors prior to ground operations to allow for any natural or cultural resource
35 surveys and protection measures that may be necessary (i.e., RCW surveys).
 - 36 d) Develop and implement a methodology, through coordination with appropriate Eglin
37 agencies and disciplines, for pre- and post-mission surveys of action areas to identify
38 extent of environmental impact to training areas and adjustment of constraints and
39 mitigations as necessary.
 - 40 e) Identify and implement funding/reimbursement mechanisms to pay for
41 leases/agreements and surveys (i.e., pre/post surveys for damage to sensitive
42 species/habitats).

- 1 f) Identify specific operating requirements (e.g., number and sizes of HLZs/DZs needed
2 for a particular year).
- 3 g) Update and revise training directives and safety procedures to make them applicable
4 to each GLI training site to provide the same level of protections for these resources
5 and their users as if these sites were subject to Eglin Range Complex requirements.
- 6 h) Develop addendums/attachments to EAFBI 13-212 Chapter 7 for BRSF and THSF to
7 identify environmental considerations detailed in this EIS.
- 8 i) Ensure compliance with EAFBI 13-212 Chapter 7 and appropriate environmental
9 requirements by identifying the proper Eglin AFB organizations responsible for
10 management of each constraint and mitigation, and ensuring the responsible
11 organization has executed the intent of the applicable requirement.
- 12 3) Through various existing program offices and current practices, Eglin AFB, with user group
13 support, will:
- 14 a) Develop forest-specific guidance on environmental restrictions and compliance
15 requirements, to include mitigations and operational constraints identified in this EIS
16 and associated consultations (i.e., environmental briefings, EAFBI 13-212 addendum).
- 17 b) Coordinate with the FFS to identify time and area constraints for training activities
18 (e.g., avoidance of specific hunting seasons and associated areas) and incorporate
19 these constraints into unit training plans.
- 20 c) Determine preferred locations for HLZs/DZs and FWALS, as well as preferred routings
21 for use, by incorporating the noise constraints identified in [Table 2-25](#) into the
22 “aeromapping” system (discussed in Section [3.3, Noise](#)) to identify overflight constraint
23 areas in support of avoiding adverse noise impacts to the public and sensitive species.
- 24 d) Determine restrictions on noise-generating expendable use for proposed training
25 activities by incorporating the noise constraints identified in [Table 2-25](#) into each
26 operational training plan to identify noise constraint areas in support of avoiding
27 adverse noise impacts to the public and sensitive species.

28 **Table 2-25. Noise Protection Levels for Proposed Action Operations**

Protection Level	Restrictions	Area Covered
Not Approved for HLZs/DZs	No HZLs or DZs permitted.	2,200-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.
RCW Air Operations Buffer	No aircraft operations permitted.	500-foot buffer around RCW trees.
Not Approved for Overflights below 500 feet AGL	No overflights below 500 feet AGL	200-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.
Not Approved for Noise Generating Expendables	No noise generating expendable use allowed; includes blanks and GBSs.	4,000-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.

AGL = above ground level; DZ = drop zone; HLZ = helicopter landing zone; RCW = red-cockaded woodpecker

- 29 e) Provide both a visual and written presentation of restrictions as presented in this EIS to
30 unit commanders and training personnel. This can be accomplished through Eglin AFB

- 1 Range Safety and Operations Procedures (RSOP) annual briefings, additional site-
2 site-specific environmental briefings (i.e., BRSF and THSF), and/or through the Eglin AFB
3 Center Scheduling Enterprise (CSE).
- 4 f) Track briefings, inspections, restrictions, and reports for regulators in accordance with
5 current Eglin procedures.
- 6 g) Provide ground training units with global positioning system (GPS) coordinates for
7 current RCW buffers.
- 8 h) Document and resolve any issues related to environmental compliance with the FFS
9 upon notice of any compliance issues.
- 10 i) Establish a process for notification of locally affected residents prior to training
11 operations.
- 12 j) Ensure the NOTAM process is utilized for use of FWALS (particularly Munson Airfield)
13 to avoid conflicts with other aviators.
- 14 k) Establish a submittal, response, and resolution process for local residences to submit
15 complaints or other compliance issues to Eglin AFB. This can be accomplished
16 through Eglin's Public Affairs Office.
- 17 l) Coordinate with the FFS to periodically review and update the affected environment
18 condition of each Proposed Action location and update as necessary the operational
19 constraints and/or mitigations identified in this EIS, as well as any of the GLI Protection
20 Level maps if required.
- 21 m) Monitor conditions of high-use training areas, including the hardened camp sites,
22 HLZs/DZ, and FWALS to ensure areas are not overused (e.g., show signs of degradation
23 or adverse impact) and do not expand beyond established boundaries.
- 24 n) Ensure units and operators utilizing emitters are aware of approved site locations for
25 any potentially hazardous emitters.
- 26 o) Evaluate emitter sites on a regular basis to ensure compatibility with safety
27 requirements identified in this EIS.
- 28 p) In addition to close examination of the area around proposed new training locations
29 for protected/sensitive species, survey the areas surrounding existing training areas
30 every two years to ensure that no new noise-sensitive land uses have been
31 established.
- 32 q) Ensure all proposed training activities are within the scope of this EIS. A new AF Form
33 813 for alterations in the location, timing, or type of activities involved in training
34 operations is required if not previously approved or within the scope of this EIS.
- 35 r) If an activity has the potential to create significant soil disturbance, a gopher tortoise
36 survey will be completed prior to the activity. If a gopher tortoise burrow is found
37 during the survey and cannot be avoided, then the tortoise would be relocated in
38 accordance with FWC protocols.

Before Training

- 4) Prior to any training activities, Unit personnel must be cognizant of environmental restrictions by:
 - a) Scheduling through Eglin AFB.
 - b) Review the GLI Protection Level maps prior to mission initiation and incorporate RAs into field maps as necessary, particularly for those areas not marked in the field (i.e., RCW buffers and other sensitive species). Units will acquire RCW buffer locations from Eglin AFB and either load these into the GPS devices or add to field maps.
 - c) Coordinate with Eglin AFB to schedule an in-briefing on environmental restrictions for Commanders, student trainers, and operational unit personnel prior to first time training at the emitter sites, BRSF and THSF; then at least annually thereafter.
 - d) Coordinate the transport, storage, use and disposal of hazardous materials and waste with Eglin AFB.
 - e) Coordinate with the Eglin AFB Cultural Resources Section for compliance with the Cultural Resource Landscape Initiative Programmatic Agreement, which identifies requirements for certain activities (i.e., ground-disturbing activities) within the prohibited, restricted, and limited use areas as indicated on the GLI Protection Level maps. Avoidance of these areas is preferred, as activities in these areas may require archaeological survey, mitigations, and consultation with the SHPO. Once training corridors are identified, these areas must be surveyed for RCW cavity trees before training can begin. Coordinate with Eglin Natural Resources to ensure that any necessary species surveys are completed prior to ground operations.
 - f) Units must ensure environmental restrictions are communicated to unit personnel that have a ground training requirement, including students, in verbal or written form prior to first time training on BRSF and THSF.
 - g) Conduct maintenance and refueling of aircraft, vehicles, and watercraft at Eglin AFB/Hurlburt Field prior to transport to training areas.

During Training

- 5) During training activities, each unit will adhere to the following constraints:
 - a) Follow restrictions shown on the Protection Levels map (as defined in [Table 2-24](#)), and all applicable restrictions detailed in EAFBI 13-212.
 - b) Restrict training to only those tactical training areas, landing/drop zones, and FWALS scheduled by Eglin AFB.
 - c) Per the FFS, during hunting season only night operations are allowed. Night operations may only occur from 2 hours after sunset to 2 hours before sunrise. The GLI Liaison, in coordination with the FFS, will identify associated time constraints on an annual basis.
 - d) In the event of unexpected discovery of cultural resources, cease activity in the immediate vicinity; notify the GLI Liaison and Eglin AFB.
 - e) Leave any artifacts visible on the ground in place; notify the GLI Liaison and Eglin AFB.

- 1 f) If personnel encounter soil that is discolored or has a chemical odor, immediately
2 cease activity in the area; notify the GLI Liaison and Eglin AFB.
- 3 g) Fueling of vehicles and aircraft is allowed only in LU-2 areas over asphalt or concrete.
- 4 h) Immediate response is required for petroleum, oil, and lubricant (POL) spills.
5 Appropriate containment (e.g., drip pans and secondary containment) during
6 refueling operations and spill response actions, including reporting requirements and
7 disposal, are required. POL products cannot be directed to sewer systems or
8 impervious surfaces (such as grass).
- 9 i) All spills and accidental discharges of petroleum, oils, lubricants, chemicals, hazardous
10 waste or hazardous materials, regardless of the quantity, will be reported. A spill
11 discharge report must be filled out, and the responsible party must provide this spill
12 report to the GLI Liaison and Eglin AFB as soon as possible. Any fire or spill that poses
13 a threat to life, health, or the environment will be reported immediately to the FFS on-
14 site coordinator and to the Eglin AFB Fire Department. The Air Force will also set up
15 Mutual Aid Agreements with the closest fire departments. If the Fire Department
16 declares an emergency condition, they may take control of the situation, including the
17 tasking of the organization's response detail. Spills over 25 gallons are required to be
18 reported to FDEP (through the GLI Liaison).
- 19 j) If any federally or state-listed species is found dead or injured, immediately notify the
20 GLI Liaison and Eglin AFB.
- 21 k) If an indigo snake, gopher tortoise, or black bear is sighted, allow the animal to leave
22 the area undisturbed; notify the GLI Liaison and Eglin AFB.
- 23 l) Comply with hunting, trapping and fishing regulations as identified by the FFS. The
24 GLI Liaison must coordinate with the FFS to determine any licenses required, take
25 limits, or activities occurring out of season.
- 26 m) Do not cut down any trees, for any reason. Do not use sensitive vegetation (e.g.,
27 protected species) as part of natural resource consumption. Confer with GRASI Liaison
28 and Eglin Natural Resources Section to identify protected vegetation.
- 29 n) Follow Management Guidelines for the *Red-Cockaded Woodpecker on Army*
30 *Installations* (see *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological*
31 *Opinion, 2013, Table 4-2*).
- 32 o) Activities within 200 feet of identified RCW trees will not exceed two hours.
- 33 p) The GLI Liaison and Eglin AFB must be notified within 24 hours for the following
34 occurrences:
- 35 a. RCW cavity tree (including wildfire damage) is damaged to the point it is
36 unsuitable for nesting or roosting.
- 37 b. RCW cavity trees, cavity start trees or the surrounding soils are inadvertently
38 damaged or disturbed during ground maneuvers.

39 *Dismounted Maneuver*

40 During dismounted maneuver, units will follow these constraints:

- 1 q) Follow restrictions identified in [Table 2-24](#) and on the GLI Protection Level maps.
- 2 r) Avoid concentrated troop movements on steep slopes and in wetlands.
- 3 s) Do not step on, fill, or in any way cause a gopher tortoise burrow to collapse.

4 *Land Disturbance*

- 5 t) Point land disturbance is authorized only in LU-2 areas. Digging is only approved in
6 these areas through coordination with the GLI Liaison and Eglin AFB prior to field
7 activities.
- 8 u) No land disturbance within 25 feet of gopher tortoise burrows.
- 9 v) For approved dig activities, fill in holes once training is complete and cover them
10 with pine straw and leaves.

11 *Wheeled Vehicles*

12 During mounted maneuver, units will follow these constraints:

- 13 w) Follow restrictions identified in [Table 2-24](#). Keep vehicles, including ATVs, on
14 established roads at all times – approved roadways are designated by the GLI Liaison
15 and FFS.
- 16 x) Do not enter Prohibited Areas: these are off-limits to all activities.
- 17 y) Keep vehicles out of eroded areas, gullies and restoration sites and avoid driving on
18 steep slopes due to erosion potential.
- 19 z) Disposal/discharge of hazardous materials to the ground or in water is prohibited.
20 Follow Eglin and/or FFS spill prevention and spill response procedures. Ensure
21 compliance with all responsibilities as outlined in EAFBI 32-7003, Hazardous Waste
22 Management.
- 23 aa) Prior to use on BRSF and THSF, and prior to use again at Eglin AFB, inspect all out-of-
24 area equipment for invasive non-native species, and clean in accordance with Armed
25 Forces Pest Management Board Technical Guide No. 31, Retrograde Washdowns:
26 Cleaning and Inspection Procedures:
27 <http://www.afpmb.org/pubs/tims/tg31/tg31.pdf>.

28 *Bivouacking*

- 29 bb) Return bivouac area to as natural an appearance as possible.
- 30 cc) Campfires are not authorized except at hardened camp sites with prior approval
31 through the GLI Liaison and Eglin AFB. The fire danger rating for each forest must be
32 checked and BRSF and THSF dispatch must be notified if any campfires are
33 proposed. If any fires are approved, units must follow forest-specific restrictions as
34 identified by the respective forest fire dispatch.
- 35 dd) Minimize water consumption from rivers and streams.
- 36 ee) Do not dam or divert water from streams or wetlands.
- 37 ff) Do not use soap or other cleaners in streams or ponds.

- 1 gg) Pack out trash. At no time will trash be buried or burned in a tactical area.
- 2 hh) Use chemical latrines for human waste disposal whenever possible during field
3 training missions and only in areas approved by the FFS. When chemical latrines are
4 not available, a cat-hole latrine or saddle trench latrine can be used in accordance
5 with service command directives.
- 6 ii) Hardstand and tent complex bivouacs are permitted only in previously cleared and
7 disturbed areas around the perimeter of HLZs and DZs.

8 *Expendable Use*

- 9 jj) Follow restrictions identified in [Table 2-24](#) and on the GLI Protection Level maps.
- 10 kk) Follow restrictions identified in [Table 2-25](#) and on the GLI Protection Level maps.
- 11 ll) At BRSF, use of noise-generating expendables is restricted to the hardened camp
12 sites. Live rounds are not authorized.
- 13 mm) At THSF, use of noise-generating expendables is restricted to those areas shown on
14 the GLI Protection Level maps. Live rounds are not authorized.
- 15 nn) Portable generators must be approved by the GLI Liaison, Eglin AFB and FFS, and
16 used in accordance with each respective policy, including containment measures
17 and spill kits.
- 18 oo) Areas with concertina/barbed wire and trip wire must be manned, and Units must
19 remove all concertina/barbed wire and trip wire once training is complete.
- 20 pp) Do not throw smokes, flares, or simulators directly into a water body.
- 21 qq) Avoid deposition of blank casings, marking cartridges, Chem-lites, and pyrotechnics
22 debris into water.
- 23 rr) Do not release chemicals or metals into streams, wetlands, or water bodies.
- 24 ss) Do not release toxic aerosols within 300 feet of streams, wetlands, or water bodies.
- 25 tt) Abandoning, dumping, burying or otherwise concealing munitions, pyrotechnics or
26 residue from these items, including packing materials is prohibited.
- 27 uu) Recycle munitions cartridges and dispose of debris from other expendables in
28 accordance with Eglin AFB and FFS operating procedures.
- 29 vv) Check the FFS Fire Danger Index (FDI) daily and coordinate with the on-site FFS
30 dispatch prior to initiation of field activities. Fire danger-specific restrictions on
31 pyrotechnics use and campfires will be established cooperatively between the FFS
32 and Eglin Wildland Fire Program. Restrictions will generally be as follows: On days
33 when the local state forest Fire Danger Rating is Very High or Extreme, no
34 pyrotechnics use or campfires will be allowed without prior approval of the Eglin
35 Wildland Fire Program Manager and the state forest Fire Manager. For days with
36 High Fire Danger, pyrotechnics will be restricted to hand-thrown simulators and
37 smoke grenades, and are to be used only on roads or in pits; no campfires are
38 allowed.

- 1 ww) Conduct a fire check (visual observation) after the use of pyrotechnics or munitions;
2 duration of the check will be dependent on the Fire Danger Rating.
- 3 xx) When a fire is started in a tactical area, the officer in charge will stop all training and
4 concentrate on fighting the fire using all available personnel in accordance with
5 guidance established in Chapter 6, Fire Fighting, of EAFBI 13-212.
- 6 yy) Report wildfires immediately to the GLI Liaison, Eglin AFB and FFS Fire Dispatch,
7 giving the location by coordinates or other recognizable geographic reference,
8 when possible.
- 9 zz) Follow the Management Guidelines for the Red-Cockaded Woodpecker on Army
10 Installations (U.S. Army, 2007) as identified in the *Eglin AFB Red-Cockaded*
11 *Woodpecker Programmatic Biological Opinion* (U.S. Air Force, 2013), Table 4-2.
- 12 aaa) Coordinate with the GLI Liaison and Eglin AFB to repair any damage caused to
13 sensitive habitats due to wildfires caused by training missions.
- 14 bbb) Coordinate with the GLI Liaison and Eglin AFB to ensure the following Air Force
15 Instruction (AFI) 32-7064 requirement is met: User groups responsible for wildfire
16 starts are required to ensure that sufficient resources (i.e., fire management
17 personnel and equipment) are available to respond to wildfires.

18 *Air Operations*

19 Units/pilots will:

- 20 ccc) Use only the approved FWALS, HLZs, and DZs.
- 21 ddd) Follow restrictions in Table 2-25 and consult Eglin AFB and the GLI Protection
22 Level maps for other restrictions associated with flight operations and incorporate
23 these into flight plans.
- 24 eee) Digging is prohibited within the boundaries of HLZs.
- 25 fff) Minimize driving on dirt landing zone/drop zones (LZs/DZs) as such practice may
26 result in increased maintenance requirements for the areas and create hazards for
27 aircraft landings.
- 28 ggg) Notify GLI Liaison and Eglin AFB of any landing zone that shows signs of overuse.
- 29 hhh) Follow Eglin spill prevention and spill response procedures. The Air Force will set
30 up Mutual Aid Agreements with the closest fire departments.
- 31 iii) Coordinate through the GLI Liaison and Eglin AFB the need for any land clearing
32 or improvements for a landing zone.
- 33 jjj) Suspend V-22 landings on days with a high or greater fire danger rating.

34 *Amphibious Operations*

- 35 kkk) Training activities must avoid inhabited recreational sites and public boaters.
- 36 lll) No power motors are allowed in Bear Lake (BRSF).
- 37 mmm) Utilize only those landing sites designated by the GLI Liaison, through
38 coordination with the FFS.

- 1 nnn) Prevent erosion of heavily used shoreline areas through restoration/stabilization,
2 rotational use, and avoiding contact with emergent vegetation along banks and
3 shorelines.
- 4 ooo) Notify the GLI Liaison and Eglin AFB of any shoreline/bank areas that show signs
5 of overuse.
- 6 ppp) Avoid contact of boat propellers with submerged vegetation (i.e., seagrass beds)
- 7 qqj) Keep boats clean to prevent introduction of invasive or nonnative species from
8 other aquatic environments. Out-of-town units must be verified clean before
9 using them in local rivers, creeks and estuaries.

10 ***After Training***

- 11 6) After interstitial training operations, units will follow these restrictions:
- 12 a) Police training areas to ensure that no trash, ammunition boxes, wire, or other debris
13 has been left in the area and all excavations are filled. Take to appropriate landfill or
14 recycling points.
- 15 b) Coordinate with the GLI Liaison and Eglin AFB on random site surveys to detect
16 environmental impacts by providing requested information.
- 17 c) Coordinate with the GLI Liaison and Eglin AFB to correct or repair environmental
18 impacts caused by training activities
- 19 d) Report excessive damage to roads, vegetation, or training assets (i.e., LZs, FWALS) to
20 the GLI Liaison and Eglin AFB. Damage must be assessed and necessary corrective
21 measures taken.

22 **2.6 ALTERNATIVE IMPACT ANALYSIS SUMMARY**

23 The following provides an impact summary of the analyses presented in Chapters [3](#), [4](#), [5](#),
24 and [6](#). Details on each specific action and the potential impacts as related to the respective
25 location can be found in these chapters. The significance of impacts was determined by
26 evaluating the context, intensity, and duration of the action (40 CFR 1508.27) and the relative
27 effect on individual resources. This process is further detailed in Chapter [3](#).

28 Impacts were evaluated with consideration of implementation of General Operational
29 Constraints inherent to the Proposed Action associated with EAFBI operational procedures
30 and other NEPA-related documents for similar actions occurring on the Eglin Range on similar
31 resources, as discussed previously in Section [2.3.2](#), *Training Activities in Northwest Florida State*
32 *Forests*. General Operational Constraints are a prerequisite for implementing the Proposed
33 Action. Once analyses were completed, additional Proposed Resource-Specific Mitigations
34 were identified to avoid or minimize adverse impacts to impacted resources. All General
35 Operational Constraints were previously described in Section [2.5](#); all Proposed Resource-
36 Specific Mitigations identified through analyses are provided in Section [2.7](#).

37 Significance of impacts is determined by considering how the Proposed Action interacts with
38 the various resources in terms of context, intensity, and duration as described in each
39 respective Chapter 3 resource section. Context can be analyzed in terms of society as a whole

1 (human, national), the affected region, the affected interests, and the locality. For instance, in
2 the case of a site-specific action, significance would usually depend upon the effects in the
3 locale rather than across a broad region.

4 *Intensity* refers to the severity of the identified impact, while *duration* considers the long-term
5 and short-term nature of the potential impact. The impact analyses considers direct, indirect,
6 and cumulative impacts on resources along with how both beneficial and adverse impacts
7 affect public safety, the characteristics of the geographic area and proximity of the Proposed
8 Action to sensitive resources, the potential controversial nature of the potential impact,
9 whether possible effects are highly uncertain or involve unique or unknown risks, whether
10 the action may establish a precedent for future actions with significant effects, cumulative
11 impacts, impacts to cultural resources or endangered species, and whether the Proposed
12 Action threatens to violate federal, state, or local laws or environmental protection
13 requirements. Each of these aspects are addressed as appropriate in the applicable resource
14 area sections and chapters in this EIS. General criteria for impacts to resource/issue areas are
15 summarized below and are presented relative to individual resource/issue areas at each
16 proposed location in [Table 2-26](#):

- 17 • **Beneficial** – Beneficial impacts may occur under any context, intensity, or duration.
18 These generally result in some benefit or overall improvement to the resource
19 impacted by the action. Such impacts may include a reduction in air emissions or
20 restoration of habitats; the scope of the impact is directly related to the context,
21 intensity, and duration of the impact. Elimination of baseline air emissions or
22 restoration of large areas of disturbed wetland may be considered significant
23 beneficial impacts, while a small reduction in baseline air emissions or restoration of a
24 small pocket of wetlands may be considered beneficial but relatively insignificant.
25 Other than providing benefits to Air Force training capabilities, the Air Force has not
26 identified any significant or insignificant beneficial impacts under the Proposed
27 Action.
- 28 • **Adverse** – Adverse impacts generally result in detriment or degradation of the
29 impacted resource, the degree or level of impact directly related to the context,
30 intensity, and duration of the impact. The Air Force has identified the potential for
31 adverse impacts for several resource areas; resources experiencing potential adverse
32 impacts are shaded yellow in [Table 2-26](#). Adverse impacts can either be significant or
33 insignificant.
 - 34 ○ **Significant** – Physical aspects are easily perceptible, and typically endure over
35 the medium-to-long term, with a regional context and a high intensity;
36 however, significant impacts can occur potentially over the short term under
37 any context given a high intensity. Significant adverse impacts are typically not
38 recoverable over the short term, and require long term recovery processes with
39 extensive mitigation or revision of Proposed Action to avoid or minimize
40 impacts. An example of a significant adverse impact would be destruction of
41 large percentages of wetland areas or degradation of water quality that may
42 affect human health and the environment.

- 1 ○ **Insignificant** – These impacts are typically short- to medium-term impacts
2 under any context or intensity. Beneficial impacts that are not significant in
3 nature may include restoration of small pockets of wetlands. Adverse but not
4 significant impacts are typically recoverable over the short-to-medium term
5 with mitigations required to minimize level of impact or potential for impact,
6 the extent of mitigation dependent on the identified context and intensity of
7 the impact. Examples of adverse impacts that are not significant may be short,
8 intermittent increases in noise to transient recreational users that do not affect
9 overall usability of the forest or the potential for localized, intermittent soil
10 erosion on stream banks due to troop movement over the land-water interface
11 during dismounted movements and amphibious operations. These are
12 recoverable impacts over the short term through Proposed Resource-Specific
13 Mitigations to avoid noise-sensitive areas for training in the case of noise
14 impacts and, for soil impacts, minimizing the size of troop units conducting
15 ground training activities, rotating land-water interface ingress/egress points,
16 and not using ingress/egress points that show signs of erosion.
- 17 ● **Neutral or No Effect** – These are impacts that are typically of a low-intensity, such that
18 they are imperceptible regardless of context or duration. Such impacts, whether
19 beneficial or otherwise, are recoverable over the short term without mitigation and
20 result in no overall perceptible change to the resource. Resources experiencing
21 neutral or no effects are identified as “green” in [Table 2-26](#).

22 Overall, the Air Force has not identified any significant beneficial or adverse impacts
23 associated with the Proposed Action. While the Air Force has identified the potential for
24 adverse impacts to various resources, these impacts would be insignificant based on the
25 context, intensity, and duration of the identified impacts as described throughout
26 Chapters 3, 4, 5, and 6. Impacts to public health and safety would be either avoided or
27 minimized through implementation of operational constraints and mitigations. Any
28 unique geographic characteristics (e.g., sensitive habitats, areas prone to erosion)
29 associated with the proposed emitter or training sites would be avoided, and any
30 potential adverse impacts to the quality of the human environment would be minimal
31 (mainly the potential for occasional annoyance to recreational users from noise). There
32 are no unknown risks or impacts that may be considered controversial in nature
33 associated with emitter site use or training activities (such actions have been extensively
34 analyzed in this EIS and other Air Force documents as referenced in this EIS), and the
35 Proposed Action is not precedent setting because the DoD utilizes public lands
36 throughout the United States for both emitter sites and military training. Adverse impacts
37 to cultural resources and endangered species have been identified; however, these
38 impacts would also be minimized/mitigated through implementation of operational
39 constraints and mitigations as identified through consultation under the NHPA and the
40 ESA, respectively. Additionally, the use of emitter sites and conduct of training activities
41 would comply with all federal, state, and local laws. Finally, the Air Force has not
42 identified any significant potential for cumulative impacts (as discussed in Chapter 7).
43 Therefore, based on the context, intensity, and duration of impacts identified in this EIS,

1 the Air Force has not identified significant beneficial or adverse impacts under the
2 Proposed Action.

3 The following section summarizes impacts for each resource area identified in yellow in
4 [Table 2-26](#), which represents potential insignificant adverse impacts. Resources
5 experiencing neutral or no effects are identified as “green” in [Table 2-26](#) and are not
6 discussed in this summary. More detail on all impacts can be found in the respective
7 resource-specific discussions provided in the associated sections by clicking on the links in
8 the table.

9 **Table 2-26. Summary of Impacts**

	Proposed Action			No Action
	Emitter Sites	Blackwater River State Forest	Tate’s Hell State Forest	
Airspace	Sections 3.2/4.2	Sections 3.2/5.2	Sections 3.2/6.2	Chapter 8
Noise	Sections 3.3/4.3	Sections 3.3/5.3	Sections 3.3/6.3	
Safety	Sections 3.4/4.4	Sections 3.4/5.4	Sections 3.4/6.4	
Air Quality	Sections 3.5/4.5	Sections 3.5/5.5	Sections 3.5/6.5	
Earth Resources	Sections 3.6/4.6	Sections 3.6/5.6	Sections 3.6/6.6	
Water Resources	Sections 3.7/4.7	Sections 3.7/5.7	Sections 3.7/6.7	
Biological Resources	Sections 3.8/4.8	Sections 3.8/5.8	Sections 3.8/6.8	
Cultural Resources	Sections 3.9/4.9	Sections 3.9/5.9	Sections 3.9/6.9	
Land Use	Sections 3.10/4.10	Sections 3.10/5.10	Sections 3.10/6.10	
Socioeconomics/ Environmental Justice	Sections 3.11/4.11	Sections 3.11/5.11	Sections 3.11/6.11	
Hazardous & Solid Materials/Waste	Sections 3.12/4.12	Sections 3.12/5.12	Sections 3.12/6.12	
Infrastructure/ Transportation	Sections 3.13/4.13	Sections 3.13/5.13	Sections 3.13/6.13	

10 **Emitter Sites**

11 The potential for adverse impacts has been identified at four proposed emitter sites. Impacts
12 are associated with the emitter safety hazard distance (SHD) and proximity to inhabited FFS
13 administrative buildings, thus resulting in potential safety issues, land use conflicts, and
14 associated socioeconomic/environmental justice impacts at those particular sites. However,
15 this impact can be avoided through mitigation actions described in [Section 2.7](#).

16 **Training Activities**

17 **Airspace Management**

18 Airspace management impacts would be regional and would include some positive impacts
19 (i.e., reduced scheduling conflicts at Eglin Range) and some negative impacts (i.e., increased
20 air traffic in controlled and uncontrolled airspace over BRSF and THSF). Impacts on
21 scheduling and coordination processes would be moderate. Implementation of a
22 coordination process between the Air Force and FFS would avoid potential operational
23 conflicts that otherwise could have been considered severe. Potential increases in scheduling
24 demand for SUAs over BRSF would be expected to be minor. At THSF, although the number
25 of sorties using Tyndall MOAs would be expected to increase, about 50 percent of GLI training

1 operations would occur after sunset when the Tyndall MOAs are not active. Impacts to
2 ongoing operations would be expected to be minor as the proposed GLI training would not
3 require blocking off a volume of airspace to be used exclusively by Air Force aircraft. Other
4 operations would be able to continue to transit the area while GLI training is under way.
5 Impacts would last for the entire life of the action, as air traffic tempo over the state forests
6 would remain slightly elevated for as long as GLI training continues to occur. However, based
7 on analysis of the context and intensity factors as described in Section [3.2.1.2](#), the Air Force
8 has not identified any significant airspace-related impacts.

9 **Noise**

10 At BRSF, noise generating expendables would only be utilized at the STOP Camp and SRYA
11 site. At THSF, noise generating expendables may be used in areas that are not restricted
12 according to operational constraints and mitigations. Noise associated with aircraft
13 operations and munitions use would result in annoyance to some recreational users and
14 residences. However, based on analysis of the context and intensity factors as described in
15 Section [3.3.1.2](#), implementation of operational constraints identified in Section [2.5](#), and
16 identified Proposed Resource-Specific Mitigations discussed in Section [2.7](#), the Air Force has
17 not identified any significant noise impacts that would affect public health or safety.

18 **Safety**

19 There is the potential for increased wildfire occurrences associated with training activities –
20 wildfire occurrence could result in adverse impacts to several resource areas. While the
21 potential for increased wildfire occurrence probability cannot be completely avoided under
22 implementation of the Proposed Action, the constraints and Proposed Resource-Specific
23 Mitigations identified in Sections [2.5](#) and [2.7](#), respectively, serve to minimize the potential for
24 wildfire probability and provide mechanisms for adequate wildfire response. As a result,
25 based on analysis of the context and intensity factors as described in Section [3.4.1.2](#), the Air
26 Force has not identified significant impacts that would affect public health or safety.

27 **Air Quality**

28 Training activities would result in small amounts of air emissions, the majority of which would
29 not result in adverse impacts at either forest. Air emissions from the Proposed Action would
30 not adversely impact public health or safety or negatively affect the quality of the human
31 environment on an action-specific or cumulative basis. All emissions would be within federal,
32 state, and local guidelines. Consequently, based on analysis of the context and intensity
33 factors as described in Section [3.5.1.2](#), the Air Force has not identified significant air quality
34 impacts.

35 **Earth Resources**

36 There are unavoidable adverse impacts associated with minor soil erosion resulting from
37 roadway use for aircraft operations, HLZ/DZ use, ground movement, and amphibious
38 operations. Land improvement activities would be limited to minor improvement of small
39 road segments (four segments in BRSF, three segments in THSF) for FWALS use and would be
40 limited to existing road beds. No National Pollutant Discharge Elimination System (NPDES)
41 permitting requirements have been identified. The intensity of these impacts is minimized
42 through implementation of General Operational Constraints and Proposed Resource-Specific
43 Mitigations identified in Section [2.5](#) and [3.6.4](#), respectively. Consequently, based on analysis

1 of the context and intensity factors as described in Section [3.6.1.2](#), the Air Force has not
2 identified any significant adverse impacts to earth resources.

3 **Water Resources**

4 Context and intensity factors utilized in water resources analyses are provided in Section
5 [3.7.1.2](#). There are unavoidable direct adverse impacts to wetlands and floodplains from
6 incidental surface disturbances (ISDs) associated with ground movement (e.g., troops walking
7 through wetlands) and amphibious operations (e.g., boats landing along the shoreline).
8 However, the Air Force has not identified any significant adverse impacts to water resources
9 under the Proposed Action because the intensity of any of the identified impacts is minimized
10 through implementation of General Operational Constraints and Proposed Resource-Specific
11 Mitigations identified in Sections [2.5](#) and [2.7](#), respectively. With the exception of minor land
12 improvement activities on unpaved road segments for aircraft operations no land
13 development activities have been proposed and no United States Army Corps of Engineers
14 (USACE) Section 404 permitting requirements for impacts to wetlands have been identified.

15 **Biological Resources**

16 Known sensitive species locations and habitat would be restricted to training activities. There
17 are unavoidable adverse impacts to biological resources from incidental disturbances
18 associated with dismounted maneuvers (e.g., potential trampling of a transient species by
19 foot traffic), aircraft noise, and amphibious operations (disturbance along shorelines). These
20 impacts would be of minor intensity and short-term in duration. Direct unavoidable impacts
21 have also been identified associated with increased wildfire potential resulting from training
22 activities. The intensity of any of the identified impacts is minimized through implementation
23 of General Operational Constraints and Proposed Resource-Specific Mitigations identified in
24 Section [2.5](#) and [2.7](#), respectively. The Air Force completed consultation with USFWS in
25 accordance with Section 7 of the ESA on April 8, 2014, and has received concurrence on a
26 finding of "Not Likely to Adversely Affect" sensitive species or habitat (USFWS, 2014). A copy
27 of the Biological Assessment and all associated correspondence is included in Appendix C,
28 *Consultation Documentation*. Therefore, the Air Force has not identified any significant
29 adverse impacts to biological resources under the Proposed Action based on context and
30 intensity factors described in Section [3.8.1.2](#).

31 **Cultural Resources**

32 Context and intensity factors utilized in cultural resources analyses are provided in Section
33 [3.9.1.2](#). Potential adverse impacts to cultural resources may occur from land disturbance
34 activities, dismounted movement, and amphibious operations due to ground disturbance.
35 Impacts mainly consist of potential disturbance or inadvertent discovery of previously
36 unidentified cultural resources in both surveyed and unsurveyed areas. Ground disturbing
37 activities would be limited in unsurveyed areas, and known cultural resource locations would
38 be avoided as part of general operations constraints (see Section [2.5](#)). The Air Force has
39 notified the ACHP, Florida SHPO, and applicable Native American tribes about this Proposed
40 Action. The Air Force is completing a Programmatic Agreement to meet its requirements
41 under Section 106 of the NHPA. The final PA and results of the consultation process will be
42 included in Appendix C of the Final EIS.

1 **Land Use**

2 Temporary annoyance to transient recreational users from noise during training activities is
3 unavoidable. Impacts to other recreational users and adjacent landowners would be
4 minimized through implementation of operational constraints identified in Section 2.5, and
5 avoidance of noise-sensitive areas. Minor, short-term small-scale closures of areas (HLZs/DZs,
6 road segments) during training activities represent less than one-half of one percent of the
7 total areas for the forests. These short-term closures would not preclude use of the forest and
8 access would be allowed once training activities have ceased. At BRSF, the STOP Camp and
9 SRYA sites are currently not open to the public, and this would not change if the Air Force
10 utilizes these locations. No conflicts with hunters have been identified since day-time training
11 activities would be restricted during hunting season. While the impacts are adverse because
12 the quality of the recreational experience may be somewhat diminished by these impacts,
13 this would not preclude recreational use or cause general incompatibility, and impacts would
14 be short term. Therefore, the Air Force does not consider the impacts to be significant based
15 on the context and intensity of identified impacts under factors discussed in Section 3.10.1.2.

16 **2.7 PROPOSED RESOURCE-SPECIFIC MITIGATIONS**

17 Based on the scope of activities associated with the Proposed Action, the inherent General
18 Operational Constraints identified in Section 2.5, and related impact analyses detailed in this
19 EIS, there are no identified Resource-Specific Mitigation impact minimization procedures
20 necessary for the following resource areas: air quality, solid/hazardous materials and waste,
21 and infrastructure and transportation.

22 Impact analysis of the Proposed Action has identified the following Proposed Resource-
23 Specific Mitigations that would be implemented, in addition to General Operational
24 Constraints in Section 2.5, to further minimize or avoid adverse impacts—in most cases
25 impacts would be minimized such that impact significance levels would be reduced from
26 “adverse” (yellow) to “neutral” or “no effect” (green).

27 **Emitter Sites**

28 At Sites EAFB-1, FFS-5, FFS-6, and FFS-7, where structures currently exist within the proposed
29 SHD but are not residential, would be verified as vacant before allowing the emitter system to
30 be utilized at these emitter locations. If not vacant, the JTE would not be utilized at these
31 locations.

32 At each site continue to monitor the proximity to populated areas to determine constraints
33 associated with the site and respective operational parameters of the specific system.

34 Prior to any land disturbance (e.g., tree clearing) sensitive species surveys would be
35 conducted. Any identified sensitive species or associated habitat would be avoided.

36 **Both Forests**

37 The Air Force would post signs collocated with existing Forest Service signage and in Forest
38 Service stations notifying forest users of the potential for encountering training in the forest.
39 This would provide public awareness of training activities in the forest. Users expecting to

1 encounter training activities and intermittent noise may be more prepared for such
2 encounters and, therefore, less surprised or annoyed by training events.

3 ***Airspace Management***

4 A coordination process would be established by which the Air Force would work with FFS
5 points of contact (POCs) prior to scheduling missions to ensure that FFS operations and
6 recreational aviation activities would not be negatively impacted by GLI training.

7 ***Noise***

8 Aircraft would not operate below 500 feet AGL except while engaged in approaches to,
9 departures from, or training at designated HLZ/DZ, OHO locations, or FWALS.

10 HLZ/DZs would be sited at not less than 2,200 feet from known noise-sensitive locations.
11 Known noise-sensitive locations include campgrounds and privately owned parcels with at
12 least one residential structure.

13 Maneuvers near the HLZ/DZ (i.e., initial approach, departure, circling, and pattern work at less
14 than 500 feet AGL) would not be conducted at distances less than 200 feet from known noise-
15 sensitive locations.

16 OHO locations would not be located within 2,200 feet of known noise-sensitive locations.

17 The full spectrum of HLZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be
18 permitted at FWALS that are remote from all known noise-sensitive locations (i.e., FWALS in
19 TA-1, the northern half of Munson Airstrip, and all FWALS in THSF). Only LAPT would be
20 allowed at the FWALS in TA-9.

21 New FWALS would not be located within 9,300 feet of known noise-sensitive locations if they
22 would also be approved for the full spectrum of HLZ/DZ uses.

23 ***Earth Resources***

24 Clear zones for FWALS would be cleared as part of normal forestry operations; the Air Force
25 would not clear any areas in support of roadway use for aircraft operations. This limits the
26 potential for adverse impacts associated with soil erosion, and eliminates the need for NPDES
27 or USACE Section 404 permitting.

28 Aircraft operations within poorly suited areas (see Section [3.6.3](#)) can only be established on
29 existing roadways that do not require land disturbance outside the existing road bed or right-
30 of-way. This limits the potential for adverse impacts associated with soil erosion, and
31 minimizes the need for excessive maintenance.

32 Conduct site fingerprinting of each proposed aircraft operation location to collect the data
33 necessary to develop and implement FWALS project plans. Site fingerprinting is a data
34 collection, ground-truthing, and reporting process designed to gather and analyze the field
35 data necessary to plan, design, and construct FWALS to fully support the proposed military
36 aircraft training activities. Site data collection tools and protocols are used during field visits
37 to gather critical roadway and affected area measurements, photopoint records, and soil
38 samples. Based on validated field features and conditions, determinations can then be made
39 as to site suitability and engineering requirements. As needed, site project plans could then
40 be developed to meet site construction and operational needs.

- 1 Utilize sites that are best suited to the intended activity and avoid areas with known
2 constraints or limitations.
- 3 Temporally and spatially disperse FWALS and HLZ/DZ training to minimize repetitive use
4 impacts to landing zone surface conditions and maximize life cycles. Utilize mission logistics
5 information to plan training events that avoid, to the degree possible, FWALS used during the
6 previous year and HLZ/DZ areas used during the previous two years. A rest period would
7 promote vegetative growth and allow disturbed areas to recover.
- 8 Construct and maintain an FWALS drainage system that collects and discharges stormwater
9 runoff in a non-erosive manner.
- 10 Inspect FWALS following each training mission. Coordinate immediate repairs of damaged
11 areas with the GLI Liaison and Eglin AFB.
- 12 Avoid clear zone maintenance during wet soil conditions. All soils are highly sensitive to
13 mechanical compaction or rutting damage when wet.
- 14 As needed, install BMPs to minimize soil disturbances (Florida Department of Agriculture and
15 Consumer Services [FDACS] 2008, USACOE 2004 and 2008). For clear zone sites with extreme
16 rutting damage, physically amend damaged soils with tillage equipment after the soils have
17 dried. Depending on extent of damage, soil structure amendments could be made with hand
18 tools or motorized tillage equipment. Areas may also need to be reseeded to native species
19 to reduce bare ground and encourage the establishment of soil protecting ground cover.
- 20 Avoid HLZ/DZ areas with highly and potentially highly erodible soils and hydric soils. Soil
21 erosion potentials increase with increasing soil erodibility and wet soil are highly sensitive to
22 damage by compaction and rutting.
- 23 Maintain at least a 100-foot exclusion buffer around sensitive steephead slopes and closed
24 depression subsidence areas to prevent accelerated soil erosion of slopes and wet soil rutting.
- 25 As necessary, install temporary metal landing mats for HLZ/DZ landing training activities
26 conducted in wet areas during poor weather conditions. Mats can reduce potentials for soil
27 damage and provide stable platforms for aircraft landings, materials and personnel loading
28 and unloading, and temporary storage.
- 29 To the degree possible, utilize established walking trails or designated roads during cross
30 county dismounted maneuvers.
- 31 Avoid cross-county maneuvers through steephead locations. The steep to very steep slopes
32 of these geologic features are highly prone to accelerated rates of erosion if disturbed.
- 33 Avoid the use of borrow pits for temporary campsites. For some pits, additional surface
34 disturbances could increase soil erosion rates or affect the stability of early-stage pit
35 reclamation.
- 36 Avoid establishing temporary camps within or in proximity to steepheads and closed
37 depression areas. These sites may be sensitive to increases in stormwater runoff of
38 disturbances associated with camp activities. An exclusion zone of at least 100 feet is
39 recommended.
- 40 Avoid sensitive streambank areas that are overheightened and oversteepened and/or areas
41 exhibiting bank scour and mass failure features.

1 To the degree possible, avoid the repetitive use of the same nonhardened egress and ingress
2 locations within the same year for amphibious operations.

3 For sites where vegetation damage could result in loss of plant cover, reseed with native
4 species to encourage the reestablishment of vegetative cover.

5 ***Water Resources***

6 Use only FFS-approved, designated vehicle water crossings in "Good" or "Fair" condition; no
7 wheeled vehicle training would occur at crossings rated "Poor" until these crossings are
8 approved by the FFS. Report any damaged water crossings identified in the field to the GLL
9 Liaison and Eglin AFB.

10 If off-road vehicle use is required for any reason the respective FFS Management Office would
11 need to be consulted prior to occurrence, and no vehicles would be allowed within 100 feet
12 of a surface water body or wetland as specified by EABFI 13-212.

13 To minimize localized damage potential from foraging and dismounted troop movements,
14 the size of troop units will be kept to small manageable numbers. Troop use would be rotated
15 within and among TAs to prevent concentration of activities in particular locations.
16 Implementation of this mitigation would allow water resources to recover from extended use
17 after intensive training activities.

18 Roads, trails, and stream/wetland crossings would be inspected before and after each training
19 mission to identify maintenance issues that could cause problems if not repaired. Training
20 activities would be shifted or redirected if conditions of roads and stream and wetland
21 crossings require repair or other measures to prevent erosion from impacting surface waters
22 and wetlands. The FFS will be notified of any identified issues.

23 Amphibious operations should use designated landing sites as coordinated through the GLL
24 Liaison and the FFS. To the extent possible, boat landings should occur on established,
25 hardened boat ramps for ingress/egress of amphibious craft. If ingress/egress must utilize
26 natural habitat in wetlands, care should be taken to prevent destruction of wetland
27 vegetation or other activities that might cause shoreline erosion. Ingress/egress points at
28 nonhardened locations for both personnel and watercraft should be rotated to the extent
29 possible to allow sites time to recover from amphibious operations.

30 ***Biological Resources***

31 Identify designated boat landing areas for amphibious operations that occur in Gulf sturgeon
32 and freshwater mussel critical habitat on the Yellow and Ochlocknee rivers, and in
33 Apalachicola Bay and East Bay, preferably with improved surfaces.

34 Develop and implement a process that will notify Eglin Natural Resources of the dates and
35 locations of upcoming training events to support spot surveys/inspections for compliance.

36 When determining preferred locations for HLZs/DZs and fixed-wing aircraft landing sites,
37 ensure incorporation of 1,000 foot buffers around bald eagle nests from 01 October to 15
38 May, and wood stork feeding/roosting habitat.

39 Annually provide ground training units with global positioning system (GPS) coordinates for
40 bald eagle nests, and wood stork roosting/feeding areas.

41 Survey proposed new training locations (including fixed wing aircraft landing sites and HLZs)
42 for protected/sensitive species, and survey existing training areas at least every 3 years to

1 identify any new sensitive species that have moved into the area. As necessary, update
2 associated operational constraints and GLI Protection Level maps.

3 Prior to any activity that has the potential to create significant soil disturbance, conduct a
4 survey for federally listed plants. If listed plants cannot be avoided, additional consultation
5 under the ESA is required.

6 Prior to any training activities and once specific training areas and corridors are identified for
7 the upcoming year, these areas must be surveyed for bald eagle nests, and active trees must
8 be marked. Coordinate with Eglin Natural Resources and the FFS to ensure that any necessary
9 markings are completed prior to ground operations.

10 Prior to any training activities, route requests for land disturbing activities through Eglin AFB
11 and the FFS for approval.

12 Follow guidance provided in the Eglin Environmental Guidebooks regarding approved plant
13 and animal species for camouflage and consumption. Develop materials for military
14 members instructing them to avoid inappropriate handling or consumption of wildlife, and
15 clarify to ground troops that diamondback rattlesnakes are not to be consumed.

16 Prior to any land disturbance (e.g., tree clearing for LOS), sensitive species surveys must be
17 conducted, and any identified sensitive species and associated habitat must be avoided. If
18 avoidance is not possible, then additional consultation under the ESA is likely to be required.

19 Prior to driving across a low water stream crossing, check for turtles and allow them to clear
20 the crossing before use.

21 Avoid driving on roads with erosion issues; report any erosion issues to the GLI Liaison.

22 Mark identified threatened and endangered plants on user maps and in the field.

23 **BRSF Only**

24 **Noise**

25 A/LVL training will not be conducted at the proposed FWALS in TA-9 and aircraft inbound to
26 and outbound from the FWALS would avoid overflying privately owned parcels with
27 residential structures where practicable.

28 Approaches to and departures from the FWALS in TA-2 (Munson Airstrip) would be
29 conducted from/to the north to avoid low overflight of a campground.

30 Aircraft departing Munson/Blackwater would initiate takeoff roll from about the center point
31 of the airstrip.

32 The Air Force would notify residents within 4,000 feet of the SRYA or former STOP camp prior
33 to use of training munitions.

34 **THSF Only**

35 **Noise**

36 Noise generating expendables would not be used within 4,000 feet of noise-sensitive
37 locations (e.g., residences, campgrounds and recreational sites). [Figure 6-1](#) through
38 [Figure 6-22](#) show the areas in which training activities would be restricted. Buffers are
39 established from all privately-owned parcels containing at least one residential structure and
40 all campgrounds.

3. PROPOSED ACTION AFFECTED RESOURCE ASSESSMENT

3.1 INTRODUCTION

In accordance with 40 CFR 1501.7(3) (Scoping), this chapter focuses on identifying and eliminating from detailed study issues that are not significant or that have been covered by prior environmental review (§1506.3). Thus, these issues are only discussed briefly here, addressing why they would not significantly affect the human environment and/or where they have been covered under other environmental studies (if applicable). Each map in this chapter is a “clickable” thumbnail image that will provide full-screen viewing; each map is also available for full-page printing in Appendix A.

This chapter details which resource/issue areas would be potentially adversely affected under the Proposed Action, based on preliminary analysis. These resource areas were carried forward for further, location-specific analyses, detailed in Chapters [4](#), [5](#), and [6](#). The affected resource areas were determined by:

- Categorizing the Proposed Action activities into “effectors.”
- Identifying the potential interactions between effectors and resource/issue area “receptors.”
- Discussing the regulatory drivers associated with each receptor.
- Providing the analysis methodologies utilized in this EIS for each resource/issue area receptor.
- Defining impact level attributes and potential for significance in each analysis methodology.
- Conducting general analysis of emitter activity and training activity effectors to identify potentially adverse impacts on associated receptors and determine those resources/issue areas to be carried forward for location-specific analyses (Chapters [4](#), [5](#), and [6](#)).
- Identifying any Proposed Resource-Specific Mitigations needed to minimize or avoid adverse impacts identified through general analyses. Additional Proposed Resource-Specific Mitigations were identified in subsequent site-specific analyses, as needed.

Utilizing this approach ensures that impacts are discussed in proportion to their significance, with only brief discussion of issues deemed not significant (40 CFR 1502.2 [b] [Implementation]).

Effectors and Receptors

Assessment of affected resources begins by first categorizing a proposed action into key effectors based on the scope of the proposed activities and the resulting potential environmental interactions. An *effector* is an aspect of a training activity that may have an effect on the environment. Each proposed activity comprises these effectors in some form, some more than others. Once effectors are known, the resources that might be affected are identified as *receptors*. As an example, training activities involve varying degrees of land

1 disturbance that interact with several different resources, such as soils and water resources.
2 Land disturbance is considered an effector, and each resource affected by land disturbance
3 activities is considered a receptor.

4 The following have been identified as the key effectors of the Proposed Action:

- 5 • Land disturbance. Actions associated with changing the landscape through the
6 disturbance of natural resources further defined by the following:
 - 7 ○ Land development. Land clearing, grading, construction, etc. Activity may
8 disturb several hundred square feet or more and may extend from the surface
9 to more than 12 inches below the ground surface.
 - 10 ○ Point impacts. Small-scale point impacts, such as placing a tent stake or picket
11 into the ground or digging a small hole. Disturbance is very localized and
12 extends less than 12 inches below the ground surface.
 - 13 ○ Incidental surface disturbance. Small-scale surface disturbance incidental to
14 other training activities, such as personnel walking around an HLZ or FWALS or,
15 generally walking around a specific training site.
 - 16 ○ Consumption. Utilization of natural resources through direct consumption (i.e.,
17 eating plants or animals).
- 18 • Ground movement. Movement of troops and vehicles across the training
19 environment further categorized as follows:
 - 20 ○ Wheeled vehicles. Utilization of trucks, ATVs, etc., as transport to, from, and on
21 the emitter or training sites.
 - 22 ○ Dismounted movement. Walking/running associated with several troops in
23 formation or out of formation across land areas from one location to another.
- 24 • UoEX. Utilization of munitions and/or equipment in support of training activities.
25 Overall, use of munitions has the potential for chemical residue to interact with the
26 environment. For purposes of analysis UoEX has been categorized further based on
27 the unique potential interaction:
 - 28 ○ Blanks/ground burst simulators (GBSs). Blanks and GBSs are noise generators
29 and, therefore, have been categorized separately from other expendables.
 - 30 ○ Smoke grenades. The main aspect of smoke grenade use is potential for fire
31 hazard; GBSs are also a potential fire hazard.
 - 32 ○ Other/equipment. Includes use of fuel during refueling operations and typically
33 nonhazardous items such as simulated munitions (consisting of plastic pellets
34 or paintballs, which produce little or no noise and have no fire hazard),
35 generators (includes emitter generators), tents, AD bundles, etc.
- 36 • Aircraft operations. Use of fixed-wing and/or rotary-wing aircraft as part of a training
37 activity.
- 38 • Amphibious Operations. Activities in which the main goal is to interact with, and
39 conduct training within, water resources (boating, shoreline interactions, etc.).

- Electromagnetic radiation (EMR). Use of radar emitters. EMR is categorized separately because it is unique to radar emitter use and has safety implications not related to other effector categories.
- Utilities. Associated with radar emitter use and the use of hardened camp sites. Similar to EMR, it is categorized separately because the impacts associated with use of utilities are not relative to other effector categories.

Table 3-1 cross-references Proposed Action components with their respective effectors:

Table 3-1. Proposed Action Component Effectors

Proposed Action Component	Component Effector												
	Land Disturbance				Ground Movement		Expendables			A/C Ops	Amph Ops	EMR	Ut.
	LD	PI	C	ISD	WV	DM	Blanks/GBS	Smoke Grenades	O/Eq.				
Emitter Sites	•			•	•							•	•
HLZs/DZs	•												
FWALS	•												
Use of Expendables							•	•	•				
Light Aviation Proficiency Training				•	•			•		•			
Low-Level Helicopter Insertions/Extractions				•	•		•	•	•	•			
Temporary Combat Support Areas		•		•	•		•	•	•				
Airdrops				•	•		•	•	•	•			
Air/Land Vertical Lift				•	•		•	•	•	•			
FARP/HGO				•	•				•	•			
Cross-Country Dismounted Movements		•		•		•	•	•	•				
Cross-Country Vehicle Movement				•	•		•	•					
Vehicle Stream and Wetland Crossing				•	•								
Blackout Driving				•	•								
Emplacement of Obstacles		•		•	•								
Bivouacking/Assembly Areas		•		•	•		•	•	•				

Table 3-1. Proposed Action Component Effectors, Cont'd

Proposed Action Component	Component Effector												
	Land Disturbance				Ground Movement		Expendables			A/C Ops	Amph Ops	EMR	Ut.
	LD	PI	C	ISD	WV	DM	Blanks/GBS	Smoke Grenades	O/Eq.				
Communication and Surveillance Operations		•		•	•				•	•			
Amphibious Operations		•		•	•	•			•		•		
Natural Resource Consumption		•	•	•	•	•							
Overwater Hoist Operations					•	•				•	•		
Opposing Forces Vehicle Operations				•	•	•	•	•	•	•			
Hardened Camp Site Use		•	•	•	•	•	•	•	•				•

A/C = aircraft; Amph = amphibious; DM = dismounted maneuvers; DZ = drop zone; FARP/HGO = Forward Air Refueling Point/Hot Gas Operations; FWALS = Fixed-Wing Aircraft Landing Sites; HLZ = helicopter landing zone; LD = land development; O/Eq. = other/equipment; PI = point impacts; ISD = incidental surface disturbance; Ut. = utilities

1 After effectors associated with each training activity were identified, potential receptors were
 2 determined based on the scope of each Proposed Action component. [Table 3-2](#) summarizes
 3 the resource areas potentially affected by the effectors given in [Table 3-1](#). Details on how this
 4 summary table was derived are provided in the respective resource-specific sections of this
 5 chapter (Sections [3.2](#) through [3.13](#)).

6 **Table 3-2. Proposed Action Affected Receptors**

Proposed Action Effectors	Resource Areas Potentially Affected by Effectors											
	Airspace	Noise	Safety	Air Quality	Earth Resources	Water Resources	Biological Resources	Cultural Resources	Land Use	Socioeconomics/ Environmental Justice	Hazardous/Solid Materials & Waste	Infrastructure
Land Disturbance												
Land development		•	•	•	•	•	•	•	•	•	•	•
Point impact					•	•	•	•				
Incidental surface disturbance					•	•	•	•				
Consumption						•	•					
Ground Movement												
Wheeled vehicles		•	•	•	•	•	•	•	•	•	•	•

Table 3-2. Proposed Action Affected Receptors, Cont'd

Proposed Action Effectors	Resource Areas Potentially Affected by Effectors											
	Airspace	Noise	Safety	Air Quality	Earth Resources	Water Resources	Biological Resources	Cultural Resources	Land Use	Socioeconomics/ Environmental Justice	Hazardous/Solid Materials & Waste	Infrastructure
Dismounted movement					•	•	•	•	•	•	•	
Use of Expendables/Equipment												
Blanks/GBS		•	•	•	•	•	•		•	•	•	
Smoke grenades			•	•	•	•	•		•	•	•	
Other/equipment		•	•	•	•	•	•		•	•	•	
Aircraft Operations	•	•	•	•	•		•	•	•	•	•	
Amphibious Operations		•	•	•	•	•	•	•	•	•	•	
Electromagnetic Radiation			•				•		•	•		
Utilities												•

GBS = ground burst simulator

1 Based on the information in [Table 3-2](#), both emitters and training activities were generally
 2 analyzed to determine the potential for adverse impacts and to determine issues to be carried
 3 forward for site-specific analysis. This general approach was utilized because, while the
 4 locations of activities may differ (e.g., BRSF, THSF), the activities would be the same and the
 5 impacts would generally be the same. Only the exact resources affected would differ.

6 For example, it is known, generally, that CCDM results in trampling of vegetation due to
 7 troops traversing the ground surface. It is also known that, generally, impacts may be adverse
 8 if troop units are large in size, movements are concentrated, and activities occur within or
 9 near sensitive habitats. The general analysis in this chapter focuses on identifying these
 10 potential issues, then conducting location-specific analysis, as detailed in subsequent
 11 chapters, to determine the degree of impact to location-specific resources from the Proposed
 12 Action components and associated effectors. This is accomplished by evaluating *significance*
 13 of the impact.

14 NEPA implementing regulations at 40 CFR Part 1502.1 (Purpose) require full and fair
 15 discussion of significant environmental impacts; furthermore, 40 CFR 1502.16 (Environmental
 16 Consequences) requires a discussion of direct/indirect impacts and their significance. The
 17 CEQ, in 40 CFR Part 1508.27, defines “significant” as consideration of both context and
 18 intensity of the impact.

19 For purposes of this EIS, the attributes of the impact in terms of type, context, intensity, and
 20 duration were considered to determine the level of impact and whether it may be considered
 21 significant. [Table 3-3](#) summarizes the impact attributes utilized in environmental analyses
 22 discussed throughout this EIS. Each attribute is further defined with respect to resource
 23 categories in Sections [3.2](#) through [3.13](#).

Table 3-3. Impact Attributes

Type of Impact	Context	Intensity		Duration
-Direct -Indirect -Cumulative	-Regional or Population Level -Localized	-High -Medium -Low -Neutral	-Beneficial -Adverse	-Long-term -Medium-term -Short-term

As discussed in Chapter 2, all training activities at the state forests would be conducted, as applicable, per the requirements of EAFBI 13-212 (Chapter 7, Environmental Management), in accordance with the respective state forest management plans, and the terms and conditions identified in the *Eglin AFB Interstitial Area Biological Assessment*, *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion*, and the *Riverine/Estuarine Biological Assessment*, as appropriate.

This EIS relies heavily on both the analyses and the resultant operational constraints imposed on the training activities within the aforementioned documents, because not only are the activities proposed under the Proposed Action exactly the same as those currently occurring on the Eglin Range, but the natural resources present at both BRSF and THSF are similar to those on the Eglin Range (e.g., red-cockaded woodpeckers, wetlands, stream banks). These documents detail previous analyses of these activities at Eglin AFB, and they provide an excellent basis for understanding the requirements (i.e., General Operational Constraints) for implementing the Proposed Action and making impact determinations for the proposed training locations. As a result, there are no highly uncertain, unique, or unknown risks associated with the Proposed Action. Consequently, these documents and previous analyses are incorporated by reference as appropriate to reduce paperwork and extraneous background data in this report (per 40 CFR 1502.1, 40 CFR 1502.21).

Additionally, determination of potentially impacted resources includes the assumption that all previously identified General Operational Constraints, as listed in Section 2.5, are inherent to the Proposed Action. As an example, General Operational Constraint 5(x) requires all vehicles to remain on designated roads. Therefore, impacts to various resources account for this constraint, and analyses were limited only to potential impacts associated with road use of vehicles.

3.2 AIRSPACE MANAGEMENT AND USE

Within the context of this EIS, the term “airspace management and use” refers to the continued safe and efficient flying operations in the airspace above BRSF and THSF. Potential “receptors” of airspace management impacts could include ongoing aircraft operations, as well as agencies responsible for scheduling and control of the local airspace.

3.2.1 Impact Assessment Methodology

The impact assessment for airspace management and use evaluates the potential impacts of the Proposed Action on airspace receptors. Impacts are evaluated according to type, context, intensity, and duration (as described in Section 3.1), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

1 **3.2.1.1 Regulatory Drivers**

2 Airspace management is defined as the direction, control, and handling of flight operations in
3 the navigable airspace. Navigable airspace is airspace above the minimum altitudes of flight
4 prescribed by regulations under USC Title 49, Subtitle VII, Part A. Congress has charged the
5 Federal Aviation Administration (FAA) with responsibility for developing plans and policy for
6 use of the navigable airspace in the U.S. and its territories to ensure the safety of aircraft and
7 its efficient use (49 USC § 40103(b); FAA Job Order (JO) 7400.2G).

8 Airspace management considers how airspace is designated, used, and administered to best
9 accommodate the individual and common needs of military, commercial, and general
10 aviation. The FAA has defined several airspace categories to accommodate varying types and
11 intensities of flight activity. Controlled airspace, airspace of defined dimensions within which
12 air traffic control (ATC) service is provided, is categorized into five separate classes, Classes A
13 through E. Each class has its own set of rules regarding how operations are to be conducted.
14 Uncontrolled airspace is designated as Class G airspace; it exists in volumes of airspace not
15 otherwise designated. ATC services for aircraft en route are provided by air route traffic
16 control centers (ARTCCs). Victor Routes are federally designated airways that act like
17 "highways in the sky" and are commonly used in routing aircraft over long distances. ATC
18 towers and traffic control (TRACON) or radar approach control (RAPCON) facilities manage
19 descending aircraft operating in their respective terminal areas.

20 The FAA has designated certain volumes of airspace as SUA in accordance with FAA Order JO
21 7400.8. RAs are a type of SUA in which flight of nonparticipating aircraft is subject to
22 regulatory restrictions due to hazards such as ongoing aerial gunnery or guided missile
23 testing. Most RAs may be released by the managing agency for use by nonparticipating
24 aircraft when not active. MOAs are a type of SUA established to separate certain military
25 training activities from nonparticipating traffic operating under instrument flight rules (IFRs)
26 (i.e., flight procedures that must be used when weather visibility minimums are not met).
27 Aircraft operating under IFRs may be routed through an MOA if ATC can provide guaranteed
28 separation from military training. Nonparticipating aircraft operating under visual flight rules
29 (VFRs) (i.e., procedures used when visibility minimums are met) are encouraged to exercise
30 extreme caution when transiting an active MOA. Alert areas are designated to make
31 nonparticipating pilots aware of a high volume of pilot training operations, or an unusual
32 type of aeronautical activity in the area. Pilots are advised to be particularly alert when flying
33 in these areas. Military training routes are designated corridors in which low-altitude, high-
34 speed military aircraft operations may be conducted. Routes designated as "instrument
35 routes" (IRs) are flown under IFRs.

36 Military airspace is managed in accordance with AFI 13-212 and Eglin AFB Instruction 13-212.
37 Compliance with applicable regulations ensures separation of aircraft while conducting
38 combat-realistic training maneuvers.

39 **3.2.1.2 Assessment Method**

40 The Proposed Action was considered in the context of existing regulations and procedures for
41 airspace management. Intensity of impacts was assessed considering the level of effort
42 involved in scheduling and controlling the proposed number of training events, as well as the
43 potential for delays to ongoing flying operations as a result of proposed training. The

1 duration of training events was one factor in determining expected airspace management
 2 issues. [Table 3-4](#) defines how the impact attributes of context, intensity and duration are
 3 applied to airspace management analyses.

4 **Table 3-4. Definitions of Impact Attributes for Airspace Management**

Attribute	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Contexts Analyzed		
Regulatory	Existing airspace management regulations and processes.	
Regional	Current regional airspace management situation including military training and civilian air traffic.	
Intensity (can be either adverse or beneficial)		
High Mitigations required to minimize/avoid adverse impacts, with scope of the mitigations based on context and duration of the exposure/impact. Unavoidable adverse effects may not be recoverable.	Substantive improvement or decline in scheduling/coordination processes within the regulatory context or within identified regional airspace. May require overhaul of existing or development of new scheduling/coordination processes to accommodate the change.	Substantively improved or degraded operational efficiency within identified regulatory or regional airspace context. May result in substantial reduction or increase in flight delays.
	Can be associated with substantive decrease/increase in flight operations resulting in comparable improved or degraded airspace availability, establishment of new SUA, or elimination of existing SUA.	
Medium Mitigations may be required to avoid adverse impacts, depending on context and duration of the exposure/impact. Unavoidable adverse impacts likely recoverable with BMPs and mitigations.	Moderate improvement or decline in scheduling/coordination processes within the regulatory context or within identified regional airspace. Impacts can typically be handled through existing scheduling/coordination processes with some changes required.	Moderate improved or degraded operational efficiency within identified regulatory or regional airspace context. May result in noticeable reduction or increase in flight delays.
	Can be associated with a moderate decrease/increase in flight operations resulting in comparable improved or degraded airspace availability or modification of existing SUA. No new SUA would be required.	
Low No mitigations required. Adverse impacts are avoidable.	Minimal change to scheduling/coordination processes within the regulatory context or within identified regional airspace. No noticeable impact to existing scheduling/coordination processes.	Slightly improved or degraded operational efficiency within identified regulatory or regional airspace context. No noticeable reduction or increase in flight delays.
	Can be associated with a decrease/increase in flight operations that are comparable to existing operations and have no noticeable impact on airspace availability. Would not require modification of existing SUA or new SUA.	
Neutral	Overall, no impact to existing scheduling/coordination process.	No impact to efficiency of operations on local or regional scale.
	No decrease/increase in flight operations and no impact on airspace availability. Would not require modification of existing SUA or new SUA.	
Duration		
Long term	Effect would likely endure for the life of the action.	
Medium term	Effect would likely last for a few months to a year.	
Short term	Effect would likely last for a few days to weeks.	

BMP = best management practice; SUA = special use airspace

5 **3.2.1.3 Impact Levels**

6 The level of impact associated with airspace and potential significance to airspace
 7 management and use is determined by considering how Proposed Action effectors could

1 interact with airspace in terms of context, intensity, and duration as described in [Table 3-4](#).
 2 [Table 3-5](#) explains the impact level categories for airspace management analyzed in this EIS
 3 and identified in Chapters [4](#), [5](#), and [6](#).

4 **Table 3-5. Impact Level Categories for Airspace Management**

Level of Impact	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Adverse	Adverse airspace impacts may result in scheduling and coordination conflicts and issues, the level of impact directly related to the impact attributes described in Table 3-4 . Adverse impacts may be perceived as significant under medium-to-high intensity scenarios at any duration if scheduling and coordination cannot be accomplished using any existing or feasibly implemented system. Uncoordinated activities would be unsafe for Department of Defense personnel or civilians, and new special use airspace would be required and result in major overhaul of ongoing flight procedures. Insignificant noise impacts would likely occur under medium-to-low intensity scenarios of short duration where existing scheduling process can be adjusted or new process implemented to facilitate de-confliction of existing and proposed operations. Proposed scheduling processes in combination with existing scheduling processes would allow continued safe and efficient operations.	Adverse impacts may result in a decline in the efficiency of ongoing operations, the level of impact directly related to the impact attributes described in Table 3-4 . Significant impacts may result in frequent, substantial delays of ongoing operations on a local or regional scale. Insignificant airspace impacts may result in delays of ongoing operations but would not be common.
Neutral / no effect	Under a neutral or no-effect scenario, existing scheduling processes can handle proposed operations tempos and no coordination is required.	Results in little or no impact to efficiency of operations on local or regional scale.

5 **3.2.2 General Emitter Activity Impact Assessment**

6 Based on the scope of action described in Chapter [2](#), emitter site use would not be expected
 7 to result in interactions with airspace management. The emitters would not be expected to
 8 have any effect on the tempo of military training operations or procedures used to manage
 9 current military and civilian operations. As a result, this issue area has not been carried
 10 forward for site-specific analysis in Chapter [4](#).

11 **3.2.3 General Training Activity Impact Assessment**

12 [Table 3-6](#) identifies potential interactions between the Proposed Action effectors and airspace
 13 management receptors. Based on the scope of action described in Chapter [2](#), activities
 14 involving land disturbance, ground movement, UoEX, Amphibious Operations, and utilities
 15 would not result in potential interactions or impacts to airspace management; these issue
 16 areas are identified as “green” in the table below and are not carried forward for site-specific
 17 analyses in Chapters [5](#) (BRSF) and [6](#) (THSF). Aircraft operations have the potential for adverse
 18 impacts and are, therefore, carried forward for site-specific analyses in Chapters [5](#) and [6](#).
 19 These areas are shaded yellow in the table below. Activities shaded in green have little
 20 potential to impact public health or safety or the human and natural environment or do not
 21 result in potential violations of federal, state, or local regulations; therefore, these activities
 22 are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

1

Table 3-6. Receptor and Effector Interactions for Airspace Management

Proposed Action Effector	Airspace Resource Area Potentially Affected (Receptor)	
	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Land Disturbance	No interaction with airspace management. This issue area has not been carried forward for site-specific analysis.	
Land development		
Point impacts		
Incidental surface disturbance		
Consumption		
Ground Movement	No interaction with airspace management. This issue area has not been carried forward for site-specific analysis.	
Wheeled vehicles		
Dismounted maneuver		
Use of Expendables	No interaction with airspace management. This issue area has not been carried forward for site-specific analysis.	
Aircraft Operations	Potential for adverse impacts has been identified. Therefore, this issue area has been carried forward for site-specific analysis. A new coordination process would be implemented between the Air Force and the FFS to ensure that GLI training would not interfere with ongoing FFS operations. Existing scheduling procedures would be followed prior to any use of existing SUA airspace above BRSF or THSF. No new SUA or modifications to existing SUA required.	This issue area has been carried forward for site-specific analysis. Ability to use BRSF and THSF for training would reduce demand on Eglin Range and its associated SUA. Demand for the Eglin Range training environment is expected to continue to increase in coming years. GLI use of SUA over BRSF and THSF would be minimal and would not be expected to result in scheduling conflicts. With proposed coordination between Air Force and FFS, GLI operations would not interfere with ongoing FFS operations. Increased VFR training operations over BRSF and THSF would not be expected to interfere with other aircraft traffic.
Amphibious Operations	No interaction with airspace management. This issue area has not been carried forward for site-specific analysis.	
Utilities	No interaction with airspace management. This issue area has not been carried forward for site-specific analysis.	

BRSF = Blackwater River State Forest; FFS = Florida Forest Service; GLI = GRASI Landscape Initiative; SUA = special use airspace; THSF = Tate's Hell State Forest; VFR = visual flight rule

2 **3.2.4 Proposed Resource-Specific Mitigations**

3 To ensure that FFS operations would not be negatively impacted by GLI training, the Air Force
 4 would coordinate with FFS POCs prior to any mission. This coordination process would
 5 minimize identified impacts from adverse (yellow) to neutral (green) over the mid- to long
 6 term.

7 **3.3 NOISE**

8 Within the context of this EIS, the term "noise" is considered to be unwanted sound that
 9 interferes with normal activities or otherwise diminishes the quality of the environment. In
 10 effect, the resource discussed here is a quiet or locally appropriate sound environment as

1 experienced by humans in general. This component of noise is referred to as a “receptor.”
2 Additional discussion of specific noise impacts on other “receptors” can be found in sections
3 discussing biological resources (noise impacts on wildlife), cultural resources (noise impacts
4 on physical objects and experiential resources), land use (noise impacts on existing land uses),
5 and socioeconomics/environmental justice (noise impacts on the economy and specific
6 subsets of the population).

7 Sound levels are recorded on a logarithmic decibel (dB) scale, reflecting the relative way in
8 which the ear perceives differences in sound energy levels. The threshold of hearing is 0 dB,
9 typical conversations are held at about 60 dB, and the threshold of discomfort is 120 dB.
10 Under normal conditions, a person with healthy hearing can detect a 3-dB change in sound
11 level.

12 Sound measurement may be further refined through the use of frequency “weighting.” In
13 A-weighted measurements, sounds at frequencies heard best by the human ear are
14 emphasized. In the case of sonic booms, blast noise, and other impulsive booming noises,
15 sound is felt as well as heard. With these types of noise, overpressure may be considered
16 more annoying than the sound itself. For this reason, impulsive sounds are measured using
17 C-weighting, which does not attenuate the lower frequencies to the extent that A-weighting
18 does. Sounds measured in these ways are quantified as A-weighted decibels (dBA) or
19 C-weighted decibels (dBC). Unless otherwise noted, all sound levels referenced in this
20 document are A-weighted.

21 The sound exposure level (SEL) is a noise descriptor that accounts for both the intensity and
22 duration of an individual noise event. The SEL provides a measure of the total sound exposure
23 for the entire event as if it was compressed into a single second and is useful for predicting
24 certain outcomes, such as awakenings from sleep.

25 Day-night average sound level (DNL) is a noise descriptor that averages A-weighted sound
26 levels over a 24-hour period, with an additional 10-dB penalty added to noise events
27 occurring between 10:00 PM and 7:00 AM. The 10-dB penalty compensates for lower
28 background noise levels at night, and the increased potential for annoyance associated with
29 late-night noise events. The onset-rate adjusted monthly day-night average sound level
30 further adjusts DNL. This metric adds a penalty of up to 11 dB to account for the potential
31 startle effects caused by low-altitude, high-speed aircraft and is calculated monthly to
32 account for the high degree of daily variability in the tempo of airspace operations during
33 training.

34 Because munitions noise levels are so strongly influenced by meteorological conditions (e.g.,
35 winds), the peak noise level reaching a particular location after a particular noise event may
36 vary significantly. The metric “peak noise exceeded by 15 percent of firing events”
37 (PK 15[met]) accounts for weather-influenced statistical variation in received single-event
38 peak noise levels. PK(met) is the peak noise level, without frequency weighting, expected to
39 be exceeded by 15 percent of all firing events.

40 **3.3.1 Impact Assessment Methodology**

41 The impact assessment for noise evaluates the potential impacts of the Proposed Action to
42 the existing sound environment and receptors in that environment. Impacts are evaluated
43 according to type, context, intensity, and duration (as described in Section [3.1](#)), as well as the

1 regulatory drivers identified below. Together, these attributes define the potential
2 significance of the impacts. The “intensity” of noise impacts is affected by characteristics of
3 the noise (e.g., spectral content, frequency of occurrence, and time of day) as well as
4 characteristics of the listener and the activity being conducted when the noise occurs. Noise
5 impact analysis addresses the potential for the Proposed Action to result in impacts to public
6 safety and human health as well as the environment from both auditory and nonauditory
7 noise impacts, annoyance, and land use compatibility. The relationships between noise and
8 biological resources and land use compatibility are addressed in the Biological Resources and
9 Land Use sections of this EIS, respectively, using the results of the noise analysis.

10 **3.3.1.1 Regulatory Drivers**

11 Since legal limits on allowable noise levels could, in some cases, reduce the combat
12 effectiveness of military equipment, such equipment has been exempted from federal
13 regulations that impose noise limitations. However, several federal regulations, policies, and
14 studies inform decision-making with regard to noise. DoD recognizes that noise-sensitive
15 land uses are not compatible with elevated military training noise levels and has adopted
16 guidelines for determining land use compatibility near military installations. According to
17 land use guidelines in DoD Instruction 4165.57, *Air Installation Compatible Use Zones (AICUZ)*,
18 residential and other noise-sensitive land uses are not considered compatible with noise
19 levels greater than 65 dB DNL, unless special structural noise attenuation measures are
20 installed. Although the Proposed Action would not occur near a military installation, noise
21 levels exceeding these established guidelines are less likely to be considered acceptable. The
22 United States Environmental Protection Agency (USEPA) has indicated that minimal impacts
23 to human health and welfare would occur at levels below 55 dB DNL (USEPA, 1974).

24 The U.S. Army is the DoD service with the lead role in setting munitions noise policy and has
25 established land use recommendations based on munitions noise levels near training ranges.
26 Army Regulation 200-1 discourages noise-sensitive land uses, such as residential, where small
27 arms firing noise exceeds 87 dB peak and strongly discourages such land uses where levels
28 exceed the 104-dB peak level only 15 percent of the time (PK 15[met]). The same regulation
29 discourages noise-sensitive land uses, such as residential, where large-arms noise levels
30 exceed 115 dB PK 15(met) and strongly discourages such land uses where large arms noise
31 exceeds 130 dB PK 15(met).

32 Several Florida Statutes establish limitations on noise generated by ground vehicles and
33 boats. Florida Statutes 316.272 and 316.293 require vehicles to be equipped with an exhaust
34 system in good working order including muffler, manifold pipe, and tailpiping to prevent
35 excessive noise. Under these regulations, vehicles exceeding a gross combination weight
36 rating of 10,000 pounds that were built after 1975 should not exceed 90 dB at a distance of 50
37 feet while operating at greater than 35 miles per hour (mph). Motorcycles built after 1979
38 should not exceed 82 dBA at a distance of 50 feet while operating at 35 mph. Florida Statute
39 261.20 requires exhaust noise for all off-highway vehicles (OHVs) manufactured after 1986 to
40 be less than 96 dBA at a distance of 20 inches. Florida Statute 327.65 addresses noise
41 exposure to humans from passing boats. It states that in order to prevent potential

1 annoyance, no vessel should exceed a maximum sound level of 90 dBA at a distance of
2 50 feet.

3 Certain counties within the ROI have enacted ordinances for the abatement of excessive and
4 unnecessary noise. Okaloosa County, for example, has established maximum sustained noise
5 levels at residential property lines of 60 dBA during 7:00 AM to 10:00 PM and 55 dBA between
6 10:00 PM and 7:00 AM. Noise generated by aircraft operations, vehicles in compliance with
7 Florida noise statutes, authorized target shooting, and law enforcement training are
8 exempted from these limitations. Santa Rosa County, Liberty County, and Franklin County
9 ordinances do not contain limitations on noise generated by proposed GLI training or emitter
10 operations.

11 **3.3.1.2 Assessment Method**

12 Aircraft noise levels were calculated using the environmental noise mapping software
13 NOISEMAP, version 7.2, and the Rotorcraft Noise Model (RNM). Munitions noise levels were
14 calculated using the Small Arms Range Noise Assessment Model (SARNAM), version 2.6, and
15 Blast Noise Version 2 Noise Impact Software (BNOISE2™). GLI training is intended to allow
16 maximum flexibility in mission planning, and several types of aircraft and ground vehicles
17 could be used by various units. For training events that could use several aircraft and ground
18 vehicle types, the loudest was selected to represent all. Surrogate noise sources were
19 selected for aircraft types for which noise levels are not included in the standard DoD source
20 noise databases. Surrogate noise source selection details are provided in sections discussing
21 each type of training event.

22 As described in Chapter 2, training locations (e.g., HLZ/DZ, FWALS, OHO location) would be
23 selected that meet the physical requirements for training and at which training could be
24 conducted without causing significant noise impacts. For purposes of this EIS, noise levels
25 were calculated at various distances from a nominal training location, to determine the
26 distance at which noise drops below impact threshold levels. During the training site
27 selection process, locations closer than these minimum distances to known noise-sensitive
28 locations would not be considered.

29 In addition to considering the location of a training site, approach/departure corridors would
30 be established for landing and drop zones. Distances from a nominal routing corridor and
31 maneuver area at which noise would drop below threshold levels are presented. This process
32 of establishing approach/departure corridors is referred to as “aeromapping.” The site
33 selection and aeromapping process would be followed whenever a new training location
34 (e.g., HLZ or FWALS) is required. As described in Chapter 2, training locations that are ideal for
35 training initially become less desirable over time due to vegetation growth and other factors,
36 and so new training locations would occasionally be required. In addition to close
37 examination of the areas around proposed new training locations, the areas surrounding
38 existing training areas would be surveyed every two years to ensure that no new noise-
39 sensitive land uses have been established.

40 One of the primary benefits of GLI training is that it provides training flexibility so as to avoid
41 scripted, nonrealistic training experiences. In a flexible training environment, many details,
42 such as aircraft ground tracks, would be variable from one mission to the next. In modeling

1 noise, threshold noise level distances were calculated based on an extremely conservative set
 2 of assumptions. Noise thresholds are based on a high estimate of operations under each
 3 applicable operational scenario. The actual number of operations at each training location
 4 would be substantially less, given the relative infrequency of training over the long term,
 5 resulting in lower noise levels than those estimated.

6 [Table 3-7](#) defines how the impact attributes of context, intensity, and duration are applied to
 7 noise analyses.

8 **Table 3-7. Definitions of Impact Attributes for Noise Resource Categories**

Attribute	Transient Users	Permanent Residents
Contexts Analyzed		
Distributed	Impacts are distributed throughout the entire state forest.	
Localized	Impacts are localized within the area surrounding the training location.	
Intensity (can be either adverse or beneficial)		
High Mitigations required to minimize/avoid adverse impacts, with scope of the mitigations based on context and duration of the exposure/impact. Unavoidable adverse effects may not be recoverable.	Substantive change in the noise environment that relatively improves the user experience or creates annoyance/impacts such that use is permanently or frequently incompatible. Examples include discontinuation of baseline aircraft operations or munitions training or creation of low-level airspace or munitions training areas where there were none previously. The USEPA predicts no impacts to human health and welfare would occur at 55 dB DNL, while DoD land use guidelines identify 65 dB DNL for aircraft noise, 87 dB PK 15(met) for small arms noise, and 62 dB CDNL for explosives noise. Although DNL does not describe noise level at any given time, a high DNL indicates that noise levels would often be high enough to interfere with activities and cause annoyance.	Substantive change in the noise environment that relatively improves quality of life or creates annoyance/impacts such that residential use is incompatible.
Medium Mitigations may be required to avoid adverse impacts depending on context and duration of the exposure/impact. Unavoidable adverse impacts likely recoverable with BMPs and mitigations.	Moderate change in the noise environment that relatively improves the user experience or creates annoyance/impacts such that use is occasionally incompatible. Examples include reduction or increase in baseline aircraft operations or munitions training.	Moderate change in the noise environment that relatively improves quality of life or occasionally creates short-term annoyance.
Low No mitigations required. Adverse impacts are avoidable.	Slight change in the noise environment that has little beneficial or adverse impact on the user experience and does not result in compatibility issues.	Slight change in the noise environment that has little beneficial or adverse impact on residents and does not result in annoyance.
Neutral	No noticeable change in the baseline noise environment.	
Duration		
Long term	Effect would be recurring for more than a year.	
Medium term	Effect would be recurring for a few months to a year.	
Short term	Effect would likely last for a few hours.	

BMP = best management practice; CDNL = C-weighted day-night level; dB = decibels; DoD = Department of Defense; DNL = day-night level; PK 15 (met) = peak level exceeded only 15 percent of the time; USEPA = U.S. Environmental Protection Agency

9 **3.3.1.3 Impact Levels**

10 The level of impact associated with noise and the impact's potential significance is
 11 determined by considering how Proposed Action effectors could interact with the existing
 12 baseline noise environment and noise resource categories (e.g., context) in terms of intensity

1 (e.g., Proposed Action noise levels), and duration as described in [Table 3-7](#). [Table 3-8](#) explains
 2 the levels of impact for the noise resource categories analyzed in this EIS and identified in
 3 Chapters [4](#), [5](#), and [6](#).

4 **Table 3-8. Impact Level Categories for Noise Resources**

Level of Impact	Permanent Residents and Transient Users (e.g., campers, hunters, and hikers)
Adverse	Adverse noise impacts may result in annoyance, incompatible land uses, or safety issues, the level of impact directly related to the impact attributes described in Table 3-7 . Adverse impacts may be perceived as significant under medium-to-high intensity scenarios at any duration if noise levels exceed USEPA and DoD guidelines and/or result in reduced public safety or incompatible land uses. Insignificant noise impacts would likely occur under medium-to-low intensity scenarios of short duration resulting in annoyance to some persons in the ROI at certain times; however, noise impacts would be less frequent and/or less intense in comparison to USEPA and DoD guidelines.
Neutral/no effect	Noise levels would be reduced relative to baseline conditions, or noise impacts would be minor enough to be considered negligible by most users. Noise from training operations may be heard but not for an extended duration. Noise does not disrupt use of the forest (e.g., camping, hunting). Noise events would be infrequent and/or not intense, such that people in the ROI rarely take notice.

CDNL = C-weighted day-night average sound level; dB = decibels; DNL = day-night average sound level; DoD = Department of Defense; PK 15(met) = metric peak noise exceeded by 15 percent of firing events; ROI = region of influence; SEL = sound exposure level; USEPA = United States Environmental Protection Agency

5 **3.3.2 General Emitter Activity Impact Assessment**

6 Proposed emitter site locations are shown in [Figure 2-3](#). The emitters would be located in
 7 rural areas, characterized by low-density residential development and agriculture as primary
 8 land uses. USEPA has stated 44 decibels (dB) and 51 dB as typical DNL noise levels at a farm
 9 area and a low-density residential area, respectively (USEPA, 1974). Based on measured noise
 10 levels in similar settings, ambient noise levels at the proposed emitter locations are assumed
 11 to be 45 dB DNL.

12 Minor improvements for security/access would be required at FWC-1, FWC-2, FFS-3, FFS-4,
 13 and FFS-8. Construction of these improvements would result in localized, temporary
 14 increases in noise that could be noticed by nearby residents. However, noise generated by
 15 construction of fences and gates would be temporary in nature, and the Air Force does not
 16 expect these activities to result in adverse noise impacts.

17 Site FWC-2 does not have a connection to electrical utilities available on-site, so a generator
 18 would be used to power the emitter. The nearest residence to FWC-2 is more than 2,000 feet
 19 away. At this distance, a typical generator would create noise at about 49 dB while running
 20 (Federal Highway Administration [FHWA], 2006). Operation of the generator would be in
 21 compliance with all applicable regulations relating to noise. Generator noise would be
 22 localized, low intensity, and brief. While it may be audible when ambient noise levels are low,
 23 the Air Force does not expect the noise to be disruptive at any noise-sensitive locations.
 24 Emitter locations with electrical utility connections available would generate minimal noise
 25 while operating.

26 Therefore, based on the context and intensity of identified impacts, the Air Force has not
 27 identified the potential for adverse impacts to public health or safety or the natural
 28 environment from noise or violations of federal, state, or local regulations associated with

1 emitter activity and this resource has not been carried forward for site-specific analysis in
2 Chapter 4.

3 **3.3.3 General Training Activity Impact Assessment**

4 Both state forests are used for recreational activities, such as camping, hiking, hunting,
5 fishing, and horseback riding, as well as for commercial activities such as logging. Ground
6 vehicles, including passenger vehicles and heavy trucks, use the roads and trails at BRSF and
7 THSF. Only electric or hand-powered boats are allowed on the recreational lakes at BRSF, but
8 gas-powered motor boats are used in other bodies of water at both forests. Privately held
9 parcels of land in the forests are used for agriculture and low-density residential
10 development. USEPA has stated 44 dB and 51 dB as typical DNL noise levels at a farm area
11 and a low-density residential area, respectively (USEPA, 1974). Based on noise levels
12 measured in similar settings, ambient noise levels (i.e., while military training is not under
13 way) at the forests are assumed to be 45 dB DNL.

14 Social surveys suggest that at noise levels below 45 dB day-night average sound level for
15 subsonic noise (DNL_{mr}), less than 1 percent of the affected population can be expected to
16 become highly annoyed, while at 65 dB DNL_{mr} , about 7 percent of the population can be
17 expected to become highly annoyed by the noise.

18 GLI training would be conducted in preparation for covert missions where the chances of
19 survival and success are maximized by avoiding detection. Training would be as similar to
20 real-world missions as possible. The following characteristics of the proposed missions are an
21 important factor in determining the patterns of noise and noise impacts.

- 22 • Avoid inhabited areas. Avoidance of inhabited areas is in keeping with a “good
23 neighbor” policy and also provides realistic training for avoiding detection during real-
24 world contingency operations.
- 25 • Use cover of darkness. Approximately 50 percent of the proposed training missions
26 would be conducted after dark. Although late-night missions are avoided to the
27 extent practicable, an estimated 20 percent of total missions would take place at least
28 partially after 10:00 PM and before 7:00 AM. As mentioned in Section 3.3.1, noise events
29 during this time period are assessed a 10-dB penalty in calculating the DNL metric to
30 account for additional annoyance caused by late-night noise. During hunting season,
31 night operations would only occur two hours after sunset to two hours before sunrise.
- 32 • Aircraft use of low altitudes. Low-altitude flight minimizes the chances of detection.
33 Lower-altitude flights are louder for people directly overflown, but noise levels drop
34 off relatively rapidly with lateral distance from the aircraft.

35 **Aircraft Operations**

36 Appendix H, Section H.3.1.5 provides a detailed description of assumptions used in noise
37 modeling, with operational numbers based on the details provided in Chapter 2. LAPT,
38 LLHI/E, AD, A/LVL, FARP, and OHO would involve aircraft maneuvering to designated
39 locations followed by training and then departure. Aircraft maneuvering to or from
40 designated training locations would operate at low altitudes most of the time and would

1 conduct approximately 50 percent of operations after dark for reasons discussed above; the
 2 percent of total operations that would occur at least partially between 10:00 PM and 7:00 AM
 3 would vary by season. Aircraft operations in noncongested areas and away from known
 4 persons, structures, or vehicles are permitted below 500 feet AGL, in accordance with FAA
 5 and Air Force regulations (14 CFR Part 91, 91.119, AFI 13-201 v3). However, it is not possible
 6 to know at any given time where all of the users of each forest are located. To minimize the
 7 likelihood of low-altitude overflights, an aircraft conducting GLI training would not operate
 8 below 500 feet AGL except while descending to or climbing away from designated training
 9 locations (e.g., HLZs/DZs, OHO locations, and FWALS). While operating at 500 feet AGL,
 10 aircraft that would commonly be used in GLI training would typically generate noise levels
 11 less than 95 dB SEL, even if they were to directly overfly a listener (Table 3-9). An SEL of 95 dB
 12 has been adopted as a voluntary noise exposure limit for aircraft operating on Eglin Range
 13 (Air Force, 2004). Direct overflights by aircraft maneuvering to or from designated training
 14 locations above 500 feet AGL would be infrequent because flight tracks would vary from one
 15 mission to the next.

16 Aircraft types other than those listed in Table 3-9 would also participate in training exercises
 17 but less frequently. These other aircraft would have similar missions and generate similar
 18 noise levels to those listed in Table 3-9.

19

Table 3-9. SEL Under the Flight Track for Representative Aircraft Types

Aircraft Category	Aircraft Type	SEL in dB ²			Power	Speed (kts)
		500 feet AGL	1,000 feet AGL	10,000 feet AGL		
Aircraft types to be used in GLI training	2-engine, propeller-driven ¹	84	79	62	100% RPM	200
	CV-22	94	90	72	60 degrees nacelle tilt	150
	H-60	91	87	N/A	LFO Lite 140 kts	140
	C-130H	95	90	67	800 CTIT	180
	H-47	87	82	60	Flyover at 120 kts	120
	T-6	98	93	73	100% engine torque	160

AGL = above ground level; CTIT = turbine inlet temperature in degrees Celsius; ETR = engine thrust request; hp = horsepower; kts = knots; LFO Lite 200 kts = helicopter in level flight at 200 knots; N/A = not applicable; NF = fan speed; RPM = revolutions per minute; SEL = sound exposure level

1. C-23 Sherpa used as surrogate noise source for various small, propeller-driven aircraft types involved in GLI; C-23 is powered by two 1,198-hp engines while CASA-212, PC-12, and M-28 are powered by pairs of 900-hp, 850-hp, and 1,100-hp engines, respectively.

2. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

20 Assuming each mission spends an hour maneuvering to and from the training location and
 21 that flight tracks are distributed evenly across the forest area over time, the noise level
 22 generated by aircraft maneuvering to and from training areas would be below 45 dB DNL_{mr}.
 23 The CH-47D Chinook was used as a surrogate noise source for multiple aircraft types for the
 24 purposes of this analysis.

1 Landings and takeoffs from dirt FWALS would be conducted by light propeller-driven aircraft
 2 as part of LAPT. [Table 3-10](#) lists noise levels generated by an aircraft representative of LAPT
 3 aircraft during landings and takeoffs. [Table 3-11](#) lists typical altitudes during approach and
 4 departure operations for a standard flight profile of a representative aircraft (i.e., C-23 Sherpa).
 5 During arrival operations, the aircraft is assumed to descend at 300 feet per nautical mile and
 6 to reach the runway threshold (i.e., the end of the FWALS) at 50 feet AGL. During approaches,
 7 aircraft generally use very low engine power settings, and noise levels are relatively low
 8 (see [Table 3-10](#)). Altitudes during departure would depend on where the aircraft rotates
 9 (i.e., becomes airborne). Aircraft typically use full power during departure so that they can
 10 climb as quickly as possible and, thus, generate higher noise levels than during approach.

11 **Table 3-10. SEL Under the Flight Track for LAPT Takeoffs and Landings**

Aircraft	SEL in dB ¹			Power	Speed (kts)
	100 feet AGL	500 feet AGL	1,000 feet AGL		
2-engine, propeller-driven ² takeoff	94	84	79	100% RPM	160
2-engine, propeller-driven landing	90	80	75	30% RPM	160

AGL = above ground level; hp = horsepower; kts = knots; LAPT = Light Aviation Proficiency Training; SEL = sound exposure level; RPM = revolutions per minute

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. C-23 Sherpa used as surrogate noise source for various small, propeller-driven aircraft types involved in GLI; C-23 is powered by two 1,198-hp engines while CASA-212, PC-12, and M-28 are powered by pairs of 900-hp, 850-hp, and 1,100-hp engines, respectively.

12 **Table 3-11. Typical Altitude at Distances From FWALS**

Operation Type	Feet from FWALS Threshold (on Approach) or Rotation Point (on Departure)				
	500	1,000	1,500	2,000	2,500
Altitude on approach ¹	75	99	124	149	173
Altitude on departure ²	51	102	154	205	256

1. Assumes 300 feet descent for each nautical mile traveled horizontally.

*2. Assumes standard climb-out profile for surrogate aircraft, the C-23 Sherpa.

13 LAPT sorties would be conducted five times per day, 232 days per year. Each sortie could
 14 include up to four aircraft but would normally include only one aircraft. Aircraft would
 15 typically only make one approach to any given FWALS. For the purpose of this analysis, the C-
 16 23 Sherpa was used a surrogate noise source representing multiple aircraft types, and all
 17 operations were assumed to follow a single flight path, effectively concentrating noise to the
 18 greatest extent possible. It was also assumed that runways are used with equal frequency
 19 and 20 percent of operations were assumed to occur after 10:00 PM.

20 Light propeller-driven aircraft are quiet compared with most other aircraft used by the
 21 military. Individual overflights by these aircraft at low altitude may be disruptive and
 22 annoying to residents or transient users of the areas surrounding the FWALS. However,
 23 overflights of light aircraft would be infrequent, and noise generated would be similar to
 24 other propeller-driven aircraft noise heard in the area currently. Operations by rotorcraft such
 25 as the CV-22 are generally louder than light propeller-driven aircraft, and A/LVL training

1 would only be conducted at locations that are relatively remote from known noise-sensitive
2 locations. When conditions at the FWALS become less than ideal for training (e.g., when
3 growth of surrounding trees make landing and takeoff unsafe), the FWALS would no longer
4 be used. New FWALS would be sited in areas at least 9,300 feet from campgrounds or
5 privately owned parcels with residential structures. At this distance, noise impacts associated
6 with operations at the new FWALS would be expected to be minimal, even under a scenario
7 where all LAPT training and one-fifth of total A/LVL training occurs at a single FWALS.

8 As described in Section [2.3.2.1](#), HLZ/DZs would be established but then replaced as needed
9 when vegetation height or other conditions become less than ideal for training. Therefore,
10 noise impacts were calculated relative to a nominal HLZ/DZ without any fixed location. There
11 would be about one training event per day at each HLZ/DZ, including LLHI/E, AD and A/LVL,
12 once GLI training is at full capacity. Under normal circumstances, training events at HLZs/DZs
13 would include one or two aircraft. Approximately 20 percent of training events are expected
14 to occur after 10:00 PM.

15 Noise levels were calculated for a scenario where about 20 percent of total LLHI/E and AD
16 training events are conducted at each nominal HLZ/DZ. A/LVL training would also be
17 conducted at FWALS, meaning that a lower percentage of total operations (13 percent) would
18 be conducted at any given HLZ/DZ. The MV-22 was used as a surrogate aircraft noise source
19 for multiple aircraft types that would conduct LLHI/E and A/LVL operations at the HLZs/DZs.
20 C-130 aircraft would be the most common aircraft type conducting AD training at HLZs/DZs
21 and was used as the noise surrogate for this type of training. C-17 aircraft would conduct AD
22 training only two to three days per year. Noise levels reflect a worst-case scenario where all
23 operations are concentrated on a single flight path and hover location. In fact, approaches
24 and departures would be distributed across multiple flight paths, and hover would occur
25 anywhere within the HLZ. This distribution would result in lower time-averaged noise levels
26 at any given location than those calculated. Noise levels greater than 55 dB DNL could occur
27 at up to 2,200 feet laterally from the HLZ/DZ and up to 200 feet laterally from
28 approach/departure paths. To avoid excessive annoyance, HLZ/DZs and HLZ/DZ approach
29 and departure paths would be greater than these distances from known noise-sensitive
30 locations (e.g., campgrounds, privately owned parcels with residences).

31 OHO would take place at surveyed locations in open water up to once per month. Training
32 events could include up to four aircraft, but one or two aircraft per event would be typical.
33 For the purposes of this analysis, it was assumed that all OHO operations would take place at
34 a single location. Because the frequency of OHO operations is low relative to other types of
35 GLI training, time-averaged noise levels generated would be low, dropping to below 55 dB
36 DNL at a distance of approximately 400 feet from a single nominal hover location. However,
37 individual OHO operations could be highly disruptive and annoying to people located
38 nearby. The noise level of a CV-22 hovering at 80 feet AGL drops to about 74 dB across water
39 at a distance of about 2,200 feet. Water absorbs very little sound energy and, therefore,
40 sound waves traveling across water lose less intensity than sound waves traveling across land.
41 To avoid excessive disturbances caused by hovering rotorcraft noise, OHO hover locations

1 would not be sited less than 2,200 feet (i.e., the same distance applied to HLZ/DZs) from
2 known noise-sensitive locations.

3 **Munitions Use**

4 Approximately 8,000 blank 7.62-millimeter (mm) (M240) and 10,000 5.56-mm (M4) rounds
5 would be fired per training event. In total, 576,000 blank 5.56-mm rounds and 196,200 blank
6 7.62-mm rounds would be fired annually. At BRSF, noise-generating expendables would only
7 be used at hardened campsites. Blank rounds do not fire a bullet and are quieter than live
8 rounds. Many of these rounds would be fired indoors, and would generate limited noise
9 outside. As described in Army Regulation 200-1, noise-sensitive land use where small arms
10 noise exceeds 87 dB PK 15(met) is discouraged, and noise-sensitive land uses where small
11 arms noise exceeds 104 dB PK 15(met) is strongly discouraged. [Table 3-12](#) lists distances from
12 the training location at which gunfire noise levels drop below these threshold levels. Noise
13 levels were calculated for a position 90 degrees to the right of the line of fire.

14 Approximately two to five ground-burst simulators would be used during each training event,
15 for a total of 5,172 ground burst simulators used annually. Ground burst simulators were
16 assumed to be used with equal frequency at the former STOP Camp and SRYA. Army
17 Regulation 200-1 discourages noise-sensitive land use where explosives noise exceeds 62 dB
18 CDNL and strongly discourages noise-sensitive land uses where noise from explosives
19 exceeds 70 dB CDNL. [Table 3-12](#) lists the distances from location of detonation at which peak
20 noise levels drop below threshold levels.

21 **Table 3-12. Munitions Noise Threshold Distances (Feet)**

Munitions Type	Distance in Feet at Which Noise Is Below Peak Noise Level (dB PK 15[met]) ¹	
	87 dB	104 dB
5.56-mm blank	525	176
7.62-mm blank	3,779	851
	Distance in Feet at Which Noise Is Below CDNL ¹	
	62 dB	70 dB
Ground burst simulator ²	2,539	1,201

CDNL = C-weighted day-night average sound level; dB = decibel; mm = millimeter; N/A = not applicable; PK 15[met] = peak level exceeded only 15 percent of the time

1. Small arms distances interpolated from measured noise levels (Stewart, 2014); BNOISE2™ used to calculate ground burst simulator noise.

2. Ground burst simulator (M115A2) modeled as TNT 0.063 kilograms (0.139 pounds).

22 **Ground Vehicle Operations**

23 Ground vehicle operations would be a central component of CCVM, VSWC, BD, and OFVO.
24 Ground vehicles would also be used to transport support personnel and equipment to
25 training locations. [Table 3-13](#) lists noise levels for heavy trucks such as a 2.5-ton truck and
26 HMMWVs. Ground vehicle training would make use of a wide variety of vehicles. Smaller
27 vehicles, such as minibikes, would generally be expected to be quieter than HMMWVs or
28 heavy trucks.

Table 3-13. Ground Vehicle Noise

Equipment	SEL (in dB) at Distance		
	100 feet	200 feet	300 feet
HMMWV ¹	62	56	50
Heavy truck ¹	76	70	64

dB = decibels; HMMWV = high-mobility multipurpose wheeled vehicle; SEL = sound exposure level

1. Navy, 2003

Ground vehicles using roads and trails on the forests include passenger vehicles as well as heavy trucks used for industrial activities, such as logging. Noise generated by ground vehicle operations conducted as part of GLI training may be annoying to persons in the forests or private inholdings, particularly when it occurs at night, generating impacts that would be considered moderate. Noise impacts would be localized to the area where ground vehicles are operating and would be limited to the duration of the training event.

Amphibious Operations

Amphibious Operations (AO) training events would involve up to six watercraft equipped with engines ranging from 35 to 200 horsepower (hp). When operated at full throttle, outboard engines generate noise that is often considered intrusive. For example, twin 225-hp engines often generate noise louder than 100 dB at 10 feet from the motors (Rudow, 2004). While training for covert missions and operating in relatively confined bodies of water, boats would not be expected to use full throttle often. AOs would be expected to occur only about 10 times per year and would be distributed among several water bodies at each forest. Impacts would be localized to the body of water in which training is taking place and would last only for the duration of the training event. Noise impacts from AOs would be considered moderate in intensity.

3.3.3.1 General Training Activity Impact Assessment Summary

Based on the scope of action described in Chapter 2, all of the training activities would have at least some interaction with noise receptors. Table 3-14 identifies potential interactions between the Proposed Action effectors and noise receptors. The location of transient users in the state forests at any given time is not known, and some users would be exposed to elevated noise levels. However, application of mission planning procedures, as identified in Section 2.5, would reduce the exposure as much as is practicable.

Based on the general training activity impact assessment described previously, activities associated with munitions use and aircraft operations could cause adverse impacts and are, therefore, carried forward for site-specific analyses in Chapters 5 (BRSF) and 6 (THSF). These activities are shaded yellow in the table below. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore; these activities are not carried forward for detailed analysis in Chapters 5 and 6.

1

Table 3-14. Receptor and Effector Interactions for Noise

Proposed Action Effector	Noise Receptor Type
	Impacts on Permanent Residents and Transient Users (e.g., campers, hunters, and hikers)
Land Disturbance	
Land development	This activity would be expected to have no effect on transient users or residences. Under the Proposed Action, only minimal land development activities may occur (i.e., roadway improvements to accommodate aircraft landings). These activities are similar to currently ongoing activities conducted by the FFS and are audible only in the immediate vicinity of the land development area. In general, noise from these activities would be localized, low intensity, and short term. Land development activities would not be expected to take place in or near frequently used areas or near residences. This issue area has not been carried forward for site-specific analysis.
Point impact	These activities would be localized, neutral in intensity, and short term; thus, they would not result in increases to the baseline noise environment and would be expected to have no effect. This issue area has not been carried forward for site-specific analysis.
Incidental surface disturbance	
Consumption	
Ground Movement	
Wheeled vehicles	This activity would be expected to have minimal effect on transient users or permanent residents. Wheeled vehicle training would use existing roadways that are used currently by FFS vehicles, vehicles involved in logging operations, and other vehicles. Noise impacts would be localized to the areas immediately surrounding roadways being used for the particular training event. Noise impacts would be short term, lasting only for the duration of the training event. Different sections of road would be expected to be used on different days to avoid scripted unrealistic training, and so locations near roadways would not be subjected to repeated noise of multiple training events. This issue area has not been carried forward for site-specific analysis.
Dismounted maneuver	This activity would be expected to have no effect on transient users or residences. Noise would be similar in type and intensity to baseline noise from recreational users (e.g., hikers) and would be localized, low intensity, and short term. Personnel would be directed to avoid noise-sensitive areas such as camp sites and residences. This issue area has not been carried forward for site-specific analysis.
Use of Expendables	
Blanks/GBS	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. Use of blanks and GBSs at BRSF would be localized to the areas near the former STOP Camp and the SRYA. Although individual training events would be short-term, training would occur repeatedly over the long term. The hardened campsites are relatively remote from known noise-sensitive locations (e.g., locations such as campsites used by transient users and permanent residences), and noise impacts would be expected to be of medium intensity. At THSF, noise-generating expendables use would be permitted throughout the state forest, subject to certain restrictions. In order to minimize potential for noise impacts, blank rounds and GBS use would not be permitted within 4,000 feet of the boundary of the state forest or known noise-sensitive locations at the state forest.
Smoke grenades	This activity would be expected to have no effect on transient users or residences. Noise associated with use would be localized, low intensity and short term. This issue area has not been carried forward for site-specific analysis.
Other/equipment	
Aircraft Operations	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. Overflight noise would be distributed throughout the state forest but would occur with increased intensity and frequency near designated training locations (e.g., HLZs/DZs, approved OHO locations, and FWALS). HLZs/DZs and OHO locations would be sited at least 3,000 feet from known noise-sensitive locations, and approach and departure paths would be designed so that noise-sensitive locations are avoided by more than 1,000 feet laterally. Noise may be annoying to transient users and permanent residents; however, application of mission planning procedures described above would avoid exceeding 55 dB at large numbers of noise-sensitive locations.

Table 3-14. Receptor and Effector Interactions for Noise, Cont'd

Proposed Action Effector	Noise Receptor Type
	Impacts on Permanent Residents and Transient Users (e.g., campers, hunters, and hikers)
Amphibious Operations	Amphibious Operations using motorized boats would be conducted in bodies of water that are used currently for motorized boating. Boats used in GLI training would not be expected to differ substantially in noise signature from boats using the water bodies currently. Thus, the increase in use associated with the Proposed Action would not be expected to result in a noticeable increase in noise. This issue area has not been carried forward for site-specific analysis.
Utilities	Utilities usage would not increase the baseline noise environment and, thus, would have no effect. This issue area has not been carried forward for site-specific analysis.

dB = decibels; DZ = drop zone; FFS = Florida Forest Service; GBS = ground burst simulators; GLI = GRASI Landscape Initiative; HLZ = helicopter landing zone; OHO = overwater hoist operations; SRYA = Santa Rosa Youth Academy; STOP = Short-Term Offender Program

1 **3.3.4 Proposed Resource-Specific Mitigations**

2 The following mitigations to minimize adverse noise-related impacts have been identified
 3 based on the general impact analyses conducted in Section 3.3:

- 4 • Aircraft would not operate below 500 feet AGL except while engaged in approaches
 5 to, departures from, or training at designated HLZ/DZ, OHO locations, or FWALS.
- 6 • HLZ/DZs would be sited at not less than 2,200 feet from known noise-sensitive
 7 locations. Known noise-sensitive locations include campgrounds and privatelyowned
 8 parcels with at least one residential structure.
- 9 • Maneuvers near the HLZ/DZ (i.e., initial approach, departure, circling and pattern work
 10 at less than 500 feet AGL) would not be conducted at distances less than 200 feet from
 11 known noise-sensitive locations.
- 12 • OHO locations would not be located within 2,200 feet of known noise-sensitive
 13 locations.
- 14 • The full spectrum of HLZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be
 15 permitted at FWALS that are remote from all known noise-sensitive locations (i.e.,
 16 FWALS in TA-1, the northern half of Munson Airstrip, and all FWALS in THSF). Only
 17 LAPT would be allowed at the FWALS in TA-9.
- 18 • New FWALS would not be located within 9,300 feet of known noise- sensitive locations
 19 if they would also be approved for the full spectrum of HLZ/DZ uses.

20 **3.4 SAFETY**

21 This section addresses safety associated with activities conducted by Eglin AFB as they relate
 22 to the Proposed Action. Discussed are safety issues associated with flight-based operations,
 23 including operations around HLZs/DZs and related training, such as ADs. This section also
 24 details potential safety impacts of ground- and water-based training activities, including BD
 25 and AOs, and the potential for training-related fires.

1 In addition, this section addresses safety impacts related to EMR emissions from the use of
2 training emitters. EMR emissions are characterized as the emissions of non-ionizing EMR
3 within the radio frequency (RF) and infrared/visual/ultraviolet spectrum used by man-made
4 emitters, including radar systems, telemetry systems, and training emitters. Radar systems
5 and training emitters are considered EMR emitters, and telemetry systems can transmit data
6 by way of microwave data links. The microwave transmitters are considered the only EMR
7 sources associated with telemetry systems. Due to the potential for hazardous human
8 exposure to EMR emissions under the Proposed Action, potential safety issues were analyzed
9 and, where appropriate, measures to reduce the potential for impacts were identified. These
10 mitigations are discussed in Section [3.4.4](#).

11 **3.4.1 Impact Assessment Methodology**

12 The impact assessment methodology for safety comprises a review of regulatory drivers
13 affecting safety; analysis of the Proposed Action and how it could pose safety risks; and
14 evaluation of the significance of potential impacts in terms of type, context, duration, and
15 intensity. These factors are detailed below.

16 **3.4.1.1 Regulatory Drivers**

17 The primary standards and regulations that apply to safety as it relates to the Proposed Action
18 are summarized below.

- 19 • Occupational Safety and Health Act (OSA), USC, Title 29, Chapter 15: The OSA is the
20 primary federal law that governs occupational health and safety in the private sector
21 and federal government in the United States. Its main goal is to ensure that employers
22 provide employees with an environment free from recognized hazards, such as
23 exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold
24 stress, or unsanitary conditions. (*Note: Under Title 29 CFR 1960 series, Occupational
25 Safety and Health Administration (OSHA) standards do not apply to military-unique
26 workplaces, operations, equipment, and systems. However, according to DoD instruction,
27 they will be followed insofar as is possible, practicable, and consistent with military
28 requirements.*)
- 29 • Forest Protection, Florida Statutes, Title XXXV, Chapter 59: Among other things, this
30 regulation establishes fire safety measures and fire response procedures at state-
31 owned forests/parks.
- 32 • Department of Defense Instruction (DoDI) 6055.1, *DoD Safety and Occupational Health
33 (SOH) Program*, dated 19 August 1998: Establishes occupational safety and health
34 guidance for managing and controlling health and safety risks for DoD personnel and
35 operations worldwide during peacetime and military deployments. It specifically
36 addresses risk management, aviation safety, ground safety, radiation safety, traffic
37 safety, occupational safety, and occupational health.
- 38 • AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health
39 (AFOSH) Program*, dated 1 June 1996: Identifies occupational safety, fire prevention,
40 and health regulations governing Air Force activities and procedures associated with
41 safety in the workplace.

- 1 • Air Force Manual 91-201, *Explosives Safety Standards*, dated 12 January 2011:
2 Regulates and identifies procedures for explosives safety and handling as well as
3 defines requirements for ordnance quantity distances, safety buffer zones, and storage
4 facilities.
- 5 • AFI 13-217, *Drop Zone and Landing Zone Operations*, dated 10 May 2007: Requires a
6 survey for safety and environmental considerations of all potential HLZs before use.
- 7 • AFOSH Standard 48-9, *Electro-Magnetic Frequency (EMF) Radiation Occupational Health*
8 *Program*: Establishes occupational safety and health guidance for managing and
9 controlling the reduction of RF exposure.
- 10 • Eglin Air Force Base Instruction (EAFBI) 13-212, *Range Planning and Operations*, dated
11 20 December 2010: Establishes procedures for the execution of operations within the
12 Eglin Test and Training Complex. These procedures will be followed by all personnel
13 conducting official business within Eglin Range.
- 14 • Air Armament Center Instruction (AACI) 48-102, *Non-Ionizing Radiation Control*
15 *Program*: Establishes procedures to minimize human hazards from the operation of
16 EMR sources.
- 17 • AACI 91-201, *Air Force Development Test Center (AFDTC) Test Safety Review Process*.
- 18 • AACI 91-203, *AFDT Safety Program*.
- 19 • DoD Instruction 6055.11, *Protection of DoD Personnel from Exposure to Radiofrequency*
20 *Radiation and Military Exempt Lasers*.
- 21 • AFI 13-212, Volume II: *Weapons Range Management*.

22 **3.4.1.2 Assessment Method**

23 Issues that could affect safety were evaluated relative to the degree to which the activity
24 would increase or decrease safety risks to military personnel, the public, and property
25 ([Table 3-15](#)). For example, the analysis evaluated whether proposed aircraft training activities
26 would pose any new or unique risks to military personnel or the general public over those
27 currently experienced at the proposed training and emitter locations. Likewise, the analysis
28 evaluated whether current practices would be adequate to prevent wildland fires from the
29 proposed Use of Expendables.

30 **Table 3-15. Definitions of Impact Attributes for Safety Resource Categories**

Attribute	Military Personnel	General Public
Contexts Analyzed		
Regional/Population	County level, state park level, or management unit level effects; impacts to populations.	
Localized	Less than management area effects; impacts to individuals.	
Intensity (can be either adverse or beneficial)		
High	Substantive change in the safety environment that results in elimination of existing unavoidable, high-level safety risks (such as loss of life or property) or introduction of new unavoidable, high-level safety risks. Examples include closure of a hazardous test and/or training area or introduction of a new hazardous test and/or training area.	
Medium	Moderate change in the safety environment that may result in a relative reduction or increase in potential safety risks, potentially resulting in injury or damage to property. Examples include reduced or increased potential for wildfire in existing wildfire-prone areas.	

Table 3-15. Definitions of Impact Attributes for Safety Resource Categories, Cont'd

Attribute	Military Personnel	General Public
Low	Slight change in the safety environment that may relatively increase safety risk but does not pose a potential for injury or damage to property to military personnel or the general public.	
Neutral	No perceptible health or safety impacts.	
Duration		
Long term	Effect would likely endure for the life of the action.	
Medium term	Effect would likely last for a few months to a year.	
Short term	Effect would likely last for a few days to weeks.	

1 3.4.1.3 Impact Levels

2 This section addresses the potential for the Proposed Action to increase safety risks, as well as
3 the Air Force's capability to manage these risks. The level of impact associated with safety
4 and the impact's potential significance is determined by considering how Proposed Action
5 effectors could interact with the safe operation of aircraft/equipment and the safety of
6 military personnel, the public, or property in terms of context, intensity, and duration as
7 described in Table 3-15. [Table 3-16](#) explains the impact level categories for safety analyzed in
8 this EIS and identified in Chapters [4](#), [5](#), and [6](#).

Table 3-16. Impact Level Categories for Safety

Level of Impact	Safety Receptors
Adverse	Adverse safety impacts may result in hazards to military personnel or the general public, the level of impact directly related to the impact attributes described in Table 3-15 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration if safety procedures could not be expected to adequately reduce the risk and risks could result in loss of life and/or property. Insignificant safety impacts may occur under medium-intensity scenarios of any duration where safety hazards to military personnel and the public are potentially increased over the baseline condition but could be mitigated by minimal modification of established safety procedures.
Neutral/no effect	Activities do not pose a potential risk for injury to military personnel or the general public or cause damage to property. Established procedures adequately control safety risks or improve the safety condition of military personnel or the general public.

10 3.4.2 General Emitter Activity Impact Assessment

11 As it relates to EMR, human exposure is defined as exposure to hazardous levels of EMR that
12 would result in adverse biological effects. These hazard safety levels, referred to as
13 permissible exposure limits (PELs), are used to develop safety standards for the operation and
14 maintenance of EMR emitters.

15 EMR exposure from an emitter source depends on several factors related to the operational
16 parameters of the emitter, including the type of emitter, the system power density, the
17 location of the emitter, and its proximity to anthropogenic and biological (plants or animals)
18 organisms. The potential impacts from radar systems and microwave transmitters can be
19 assessed using hazard areas. Human hazard areas are based on exposure levels, and are
20 regulated, maintained, and controlled by 96 AMDS/SGPB to ensure that the general public
21 and military personnel are not exposed to hazardous levels of EMR. The height of the radar
22 system is also considered to understand how high above the ground the hazard exists. In
23 general, radar systems are frequently equipped with a mitigating measure (elevation

1 interlock) that shuts the system down if the radiating beam drops below horizontal, reducing
2 the chance of exposure to terrestrial organisms (U.S. Air Force, 2003).

3 Three types of emitter systems would be utilized under the Proposed Action: the KTM system,
4 the MCM system, and the JTE. The MCM and KTM systems do not emit EMR. The JTE does
5 emit EMR and, therefore, could adversely impact humans. JTE systems have three primary
6 components: the threat emitter unit (TEU) radar emitters, the TEU pedestal emitters, and the
7 command and control unit (C2U) identification, friend or foe (IFF) antenna. Each component
8 presents the potential for EMR exposure to anthropogenic receptors.

9 Based on a JTE systems safety hazard analysis (SSHA) report, personnel must maintain at least
10 400 feet from the TEU radar emitters, TEU pedestal emitters, and C2U antennas during
11 operation to comply with the OSHA radiation limit of 10 milliwatts per square centimeter
12 (mW/cm^2). Encroaching within the 400 feet hazard area can result in adverse effects to
13 humans. Additionally, EEDs must maintain a safe distance of 268.7 feet, and fuel must be
14 stored no closer than 198.3 feet from the JTE to comply with the $5\text{-mW}/\text{cm}^2$ radiation limit
15 (MTC and Northrop, 2008). The human hazard area was overlaid at each of the proposed
16 emitter sites to determine the anthropogenic receptors potentially affected by EMR exposure.
17 [Table 3-15](#) defines the level of impacts that could potentially occur from EMR exposure.

18 Based on the scope of action described Chapter 2, EMR exposure from emitter activities could
19 impact the following receptors that may be proximate to the proposed emitter sites:
20 members of the general public, FFS resident staff, FFS daily staff, and sheriff department staff
21 (see [Table 2-1](#) in Chapter 2). The MCM and KTM systems do not radiate EMR; therefore, no
22 significant or adverse effects would occur. Adverse impacts would occur if the JTE emitter's
23 safety hazard area interferes with areas open to the general public. However, as part of the
24 Proposed Action, emitters would be placed in accordance with the SHDs described in the
25 2008 SSHA report to avoid populated areas (habitable buildings, recreation sites, etc.) and
26 comply with the OSHA radiation limits. The emitter sites would also be fenced, or have other
27 security measures in place to prevent unauthorized personnel from entering the safety
28 hazard areas.

29 The use of emitters and associated EMR exposure could also impact biological resources
30 (Section 3.8), land use (Section 3.10), and socioeconomic resources (minority and low-income
31 populations) (Section 3.11). Potential impacts to these resource areas are discussed in the
32 respective sections. EMR exposure is not expected to impact any other resource areas. Site-
33 specific emitter use is further detailed in Chapter 4.

34 During the scoping period for this Proposed Action, members of the public expressed safety
35 concerns over the interaction between emitters and in-flight pilot instrumentation. The use
36 of training emitters would not impact civil air traffic or the ATC system. Training emitters
37 transmit at a specific frequency to simulate a threat. Civil air traffic would only detect the
38 threat if the aircraft receiver were tuned to the emitter frequency.

39 **3.4.3 General Training Activity Impact Assessment**

40 Based on the scope of action described in Chapter 2, the following proposed activities would
41 cause impacts only at a very low to neutral level. Therefore, these are not discussed further in
42 this document: land disturbance, ground movement (dismounted movement), and utilities
43 usage. These activities are conducted on a day-to-day basis and would result only in minor

1 potential impacts to safety that would be mitigated through General Operational Constraints
2 identified in Section 2.5.

3 The following training activities could result in potential safety impacts, and are discussed in
4 greater detail in this document: ground movement (i.e., operations with wheeled vehicles),
5 UoEX, aircraft operations (i.e., general flight operations, HLZs/DZs, LLHI/Es, ADs, FARP/HGO,
6 and AOs.

7 The main safety issue to the general public is associated with an increase in the potential for
8 wildfires caused by various training activities. Because activities would occur at a state forest,
9 the FFS has the primary responsibility for prevention, detection, and suppression of wildfires
10 wherever they may occur. The FFS provides leadership and direction in the evaluation,
11 coordination, allocation of resources, and monitoring of wildfire management and protection.

12 To minimize the potential for fires from the Use of Expendables and general training activities
13 (such as idling vehicles and aircraft), before a mission begins, units would obtain the daily fire
14 danger rating and coordinate with FFS personnel to ensure that adequate fire response is
15 available if needed. Under Florida law, it is unlawful for any person to set fire to, or cause fire
16 to be set to, any wildlands or to build a campfire or bonfire or to burn trash or other debris
17 within the designated area of a severe drought emergency unless a written permit is obtained
18 from the division or its designated agent. Units would also appoint a fire marshal on a daily
19 basis while in the field to ensure all personnel have been trained concerning the safe use of
20 incendiary devices and to supervise the immediate suppression of fires. All fires would be
21 reported as soon as possible to the FFS and to local fire department, as necessary.

22 Standard operating procedures (SOPs) and associated General Operational Constraints in
23 Section 2.5 prescribe the regulations and general precautions to be taken in the Use of
24 Expendables and energy-producing equipment, as well as the use of training/maneuver
25 areas, airspace, and landing and drop zones. Safety procedures associated with routine
26 training operations are designed to minimize or altogether eliminate risks to the public.
27 These procedures would be implemented through the individual organization, based on its
28 specific training protocols/guidance. Potential impacts related to proposed activities and
29 existing safety procedures to minimize these impacts would be applied at both BRSF and
30 THSF and are discussed below.

31 **Ground Movement (Wheeled Operations)**

32 Routine vehicle operations would be conducted in accordance with established traffic laws
33 and would present minimal risks. However, NVG/BD is considered a high-risk training event.
34 To perform NVG operations at Eglin AFB, a risk management plan must be prepared in
35 accordance with the unit's command policy statement for each exercise utilizing NVGs; this
36 same procedure would be applied at BRSF and THSF.

37 BD must occur only on roads designated for this use and that are closed to the public.
38 Additionally, commanders must establish NVG speed limits consistent with weather, terrain,
39 and the NVG driving skill level of all soldiers participating as assessed in the risk management
40 plan. However, speed limits would not exceed 15 miles per hour. Commanders must also
41 ensure driver/operators that have not driven under NVG conditions in the past six months
42 receive organizational refresher training prior to participating in NVG driving operations.

1 Finally, trainers must ensure that safety briefings include a review of NVG limitations
2 (especially the restriction of peripheral vision), limits in seeing through obscurants (smoke,
3 fog, dust), and the need for preventive maintenance.

4 **Use of Expendables**

5 Ground-burst simulators and smoke cartridges would be employed as part of proposed
6 activities. Ground-burst simulators replicate the detonation of artillery and mortar projectiles
7 or artillery-type rockets. They typically produce a high-pitched whistle that lasts two to four
8 seconds and then detonate with a loud report and brilliant flash. Smoke cartridges are used
9 by ground soldiers to signal aircraft. They are designed to produce a smoke cloud that lasts
10 up to 30 seconds. The devices operate by burning and/or detonating a small pyrotechnic
11 charge. Safety procedures are currently in place to prevent potential injuries associated with
12 loud noises or with flying debris generated during detonation of these devices. These
13 procedures include training personnel in the proper use of these devices and the
14 implementation of applicable safety or exclusion zones, depending on the type of
15 pyrotechnics used.

16 UoEX also poses a danger for causing a fire; the major causes of forest fires at Eglin AFB are
17 incendiary training aids such as flares, blanks, simulators, pyrotechnics, and smoke grenades,
18 as well as incendiary ammunition and incendiary and smoke devices dropped from aircraft.
19 Other causes fires not related to training aids are typical causes of wildfires at locations
20 outside of military testing and training areas. These include careless use of cigarettes and
21 matches, improper control of campfires, and vehicle ignition/idling on dry grass. The
22 potential for wildfire at both BRSF and THSF would increase over the baseline condition due
23 to the Use of Expendables.

24 At Eglin AFB, climatic conditions may dictate restrictions on the types of munitions to be fired
25 during portions of the year to minimize the danger of fires, and this would be applied at BRSF
26 and THSF in coordination with state forest managers in conjunction with state forest fire
27 ratings. Since 2009, approximately 300 fires have occurred at Eglin AFB as a result of military
28 mission activities; it is unknown exactly how many are related to the Use of Expendables.
29 Before a mission begins, units must obtain the daily fire danger rating by visiting the Eglin
30 AFB Environmental Management Homepage. Adherence to these pyrotechnics restrictions is
31 mandatory. Fire ratings for operations are listed below.

- 32 • Fire danger low – No restrictions on missions.
- 33 • Fire danger moderate – No restrictions on pyrotechnics. A fire watch must be posted
34 for at least 20 minutes after completing the use of pyrotechnics.
- 35 • Fire danger high – Use caution with pyrotechnics. Post a fire watch for a minimum of
36 30 minutes after completing use of pyrotechnics. Extra precautions required for
37 campfires.
- 38 • Fire danger very high – Restrict pyrotechnics to hand-thrown simulators or smoke
39 grenades. No flares of any type. Use simulators or grenades only on roads or in pits.
40 Cleared areas for pyrotechnics should be a minimum of 1.5 times the blast radius. No
41 campfires.

- Fire danger extreme – No pyrotechnics allowed without prior approval from the Wildland Fire Program Manager (WFPM) or designee at the Eglin AFB Natural Resources Section.

All training activities would adhere to General Operational Constraints identified in Section 2.5, which include coordination with the each respective FFS forest dispatch to obtain the current fire rating for the respective forest prior to training. Units must also appoint a fire marshal on a daily basis (eligible personnel must have a minimum rank of a noncommissioned officer or equivalent rank) while in the field to ensure all personnel have been trained concerning the safe use of incendiary devices and to supervise the immediate suppression of fires. All fires must be reported as soon as possible to the L.I.T. and respective forest operations center.

Aircraft Operations

Eglin AFB has well-established procedures for proposed training operations, including the use of HLZs/DZs, low-level insertions, ADs, LAPT, and OHO. These procedures would be utilized for training activities under the Proposed Action.

These procedures include ensuring that during LAPT operations, any roads used for landing are closed to all vehicle traffic. Procedures also include mandatory use of a landing zone controller (LZC)/drop zone controller (DZC) for all helicopter operations, and during hours of darkness for fixed-wing air-land operations. LZC/DZC personnel would be responsible for all activities on and immediately above the landing zone/drop zone (LZ/DZ). The LZC/DZC would attend the crew briefing to discuss issues such as position of block letters, runway lighting, radio frequencies, etc. As a minimum, the LZC/DZC must coordinate with the aircrew prior to the aircrew departing for the aircraft. Ambulance and crash rescue support must also be coordinated during the scheduling process.

The LZC/DZC would coordinate a drop/landing zone closure plan to include temporary obstructions (cones) and signage. The LZC/DZC would also implement the access control plan and ensure the area is safe for operations. Established procedures require that the LZC/DZC contact the Range Operations Control Center (ROCC) at least 30 minutes before operations begin to take responsibility for the area, to ensure that the airspace/mission has been activated.

Prior to making this call, the LZC/DZC would ensure the range/area closure plan has been implemented and all nonparticipating personnel are clear of hazardous operations. The LZC/DZC would maintain two-way radio communication with the drop aircraft and with Eglin AFB Mission Control. In the event of radio communication failure, a single red smoke grenade or other established visual signal would be used to indicate "no drop" and operations would be suspended until air-to-ground communications are reestablished.

When helicopter operations are being conducted at a remote site not involving a mission profile, the Eglin Radar Control Facility (ERCF) issues visual flight rules (VFR) traffic advisory information on a workload permitting basis to all aircraft transiting the area occupied by the helicopter, to include operation area and corresponding altitudes, if known. The transient altitude for all rotary wing aircraft across VFR corridors shall be at or below 500 feet AGL unless otherwise directed by Eglin AFB Mission Control.

1 Over the last 15 years, approximately 42 fatal overland aircraft mishaps occurred in northwest
2 Florida (extending from Tallahassee to Pensacola). All of these mishaps were associated with
3 general aviation (nonmilitary aircraft) (National Transportation Safety Board [NTSB], 2013).
4 There have been no fatal overland mishaps involving military aircraft, and there are no
5 recorded mishaps associated with collisions between general aviation and military aircraft.

6 Over the same period, there have been a few nonfatal aircraft mishaps involving military
7 aircraft. The most significant of these were a June 2012 crash of a Bell-Boeing CV-22B Osprey
8 during a routine training mission on the Eglin AFB reservation, and a November 2012 crash of
9 a Tyndall AFB F-22 fighter just south of Panama City.

10 To minimize the potential for mid-air collisions or near misses with other aircraft in the region
11 when conducting HLZ/DZ, LAPT, or other similar training, the ERCF would issue a VFR traffic
12 advisory to all aircraft transiting the area being used by the military. Eglin AFB would
13 continue to implement its Mid-Air Collision Avoidance (MACA) Program. This program is
14 designed to help increase military pilot awareness of the training airspace and activities.
15 Implementation of established procedures would ensure that the potential for mishaps
16 involving military aircraft continues to be extremely low. Consequently, negligible impacts
17 would be anticipated from implementation of the proposed action with respect to aircraft
18 mishaps.

19 Also, all units conducting FARP/HGO must have the fire department available during these
20 training activities. A fire truck must be located a maximum of 1,000 feet from the fueling site,
21 in plain view, and in direct communication with the team controlling the operation. No later
22 than 30 minutes prior to scheduled operations, the fire truck would be on scene and notified
23 by the on-scene commander when the aircraft arrives. All operations would take place over
24 concrete or asphalt surfaces.

25 For OHO activities the training unit, in conjunction with the organizational safety officer, must
26 evaluate each operation in or over water (to include a risk analysis) to determine required
27 safety measures based on type of operations, existing or expected conditions, and existing
28 policy.

29 The V-22 (Osprey) also poses a greater risk of starting wildfires than other aircraft. The V-22
30 rotates its engines to a vertical position for takeoffs and landings. If the aircraft is operating
31 over very dry vegetation, the hot downwash from the engines has the potential to cause a
32 brush fire underneath. For example, in June 2013, a Marine MV-22 started a grass fire at the
33 Dare County Bombing Range in North Carolina. It is unknown if the fire occurred during
34 takeoff or landing. The fire caused minor damage to the aircraft, and the burning vegetation
35 had been contained before the Fire Department arrived (Jacksonville Daily News, 2013). To
36 avoid potential wildfires, as part of normal operational constraints, V-22 operations would be
37 restricted on days with high or greater fire danger, or alternatively, additional fire response
38 personnel would be made available to extinguish any small fires before they could spread.

39 **Amphibious Operations**

40 These include AOs by boats/personnel. As part of general operating constraints identified in
41 Section [2.5](#), all land-water transitions involving boats coming ashore must use approved boat
42 landing sites. Water operations must also include a boat operator and a qualified safety
43 swimmer for every boat. Medical coverage must be in place prior to OHO or personnel ADs

1 into the water. If medical personnel are not in the same safety boat as the DZC,
2 communications must be ensured.

3 Implementation of the procedures described above, as they relate to specific training
4 activities, would minimize or eliminate potential adverse impacts to safety.

5 **3.4.3.1 General Training Activity Impact Assessment Summary**

6 [Table 3-17](#) summarizes potential interactions between Proposed Action effectors and safety
7 resource effectors. Based on the general training activity impact assessment described
8 previously, activities associated with UoEX could cause adverse impacts and are, therefore,
9 carried forward for site-specific analyses in Chapters [5](#) (BRSF) and [6](#) (THSF). These activities
10 are shaded yellow in the table below. Activities shaded in green have little potential to
11 impact public health or safety or the human and natural environment or do not result in
12 potential violations of federal, state, or local regulations. Therefore, these activities are not
13 carried forward for detailed analysis in Chapters [5](#) and [6](#).

14 **Table 3-17. Receptor and Effector Interactions for Safety Resources**

Proposed Action Effector	Safety Receptor Type	
	Military Personnel	General Public
Land Disturbance		
Land development	No effect to the current safety environment. Construction activities would follow established Air Force and OSHA-related safety requirements. This issue area has not been carried forward for site-specific analysis.	
Point impact	These activities would be localized, neutral in intensity, and short term; thus, they would not result in increases to the baseline safety environment and would be expected to have no effect. This issue area has not been carried forward for site-specific analysis.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	Potential for injury from traffic accidents or as a result of NVG/Blackout Driving training. However, this potential would be mitigated through SOPs and safety measures. This issue area has not been carried forward for site-specific analysis.	Little potential for impacts; normal traffic rules would apply to use of wheeled vehicles on roadways, and Blackout Driving would occur only on roads designated for this use that are closed to the public during training activities. This issue area has not been carried forward for site-specific analysis.
Dismounted maneuver	This activity would be expected to have no effect on the safety environment for military personnel or the general public. This issue area has not been carried forward for site-specific analysis.	
Use of Expendables		
Blanks/GBS	Potential for injuries associated with loud noises, burns, or flying debris from detonation of these devices. However, these risks to military personnel are inherent to these types of training activities and are mitigated to the extent possible through implementation of SOPs and safety measures. This activity would be expected to have no effect on transient users or residences. This issue area has not been carried forward for site-specific analysis.	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. The general public would not be exposed to direct impacts from Use of Expendables given implementation of training SOPs, safety measures, and avoidance of the general public during use. Risk of wildfire is increased due to Use of Expendable (GBS, smoke grenades, generators, etc.), which could affect the safety of the general public.
Smoke grenades		
Other/equipment	Use of other equipment (generators, etc.) would	

Table 3-17. Receptor and Effector Interactions for Safety Resources, Cont'd

Proposed Action Effector	Safety Receptor Type	
	Military Personnel	General Public
	have no effect on the safety environment for military personnel. This issue area has not been carried forward for site-specific analysis.	
Aircraft Operations	There is a minor potential for impacts resulting from an aircraft mishap, airdropped items, personnel falls, etc. However, these potential safety risks would be mitigated through flight controls and training SOPs. Use of roadways for landing strips would be accomplished through road closures to avoid safety impacts to the public. There would be little to no effect on the existing safety environment from aircraft operations. This issue area has not been carried forward for site-specific analysis.	
Amphibious Operations	There is an inherent potential for drowning and boating mishaps during Amphibious Operations. As with other operations, these activities would be conducted in accordance with established training SOPs and safety measures. As a result, these activities would be expected to have no effect on the existing safety environment for military personnel. This issue area has not been carried forward for site-specific analysis.	These activities would be designed to avoid interactions with the public, thus eliminating the potential for boating mishaps/interaction with the general public. As a result, no effect to public safety is expected. This issue area has not been carried forward for site-specific analysis.
Utilities	This activity would not result in safety impacts and would be expected to have no effect. This issue area has not been carried forward for site-specific analysis.	

GBS = ground burst simulator; NVG = night vision goggle; OSHA = Occupational Safety and Health Administration; SOP = standard operating procedure

1 **3.4.4 Proposed Resource-Specific Mitigations**

2 Based on the general impact analyses presented in Section [3.4](#), no Resource-Specific
3 Mitigations for safety have been identified.

4 **3.5 AIR QUALITY**

5 For purposes of this EIS, the term “air quality resources” refers to air within the region where
6 the Proposed Action would occur. This component is referred to as a “receptor.” Air quality is
7 affected by three primary sources of air pollutants: stationary (factories or power plants),
8 mobile (cars, planes, trains), and natural (windblown dust or volcanic eruptions). The air
9 quality assessment considers the six criteria pollutants primarily from mobile sources and
10 munitions as well as greenhouse gas (GHG) emissions.

11 **3.5.1 Impact Assessment Methodology**

12 The impact assessment for air quality evaluates the potential impacts of the Proposed Action
13 on air quality. Impacts to air quality resources are evaluated according to type, context,
14 intensity, and duration (as described in Section [3.1](#)), as well as regulatory drivers identified
15 below. Together, these attributes define the potential significance of the impacts.

1 **3.5.1.1 Regulatory Drivers**

2 Laws and regulations applicable to the Proposed Action for air quality and greenhouse gases
3 are summarized in this section.

4 **Air Quality**

5 Air quality is determined by the type and amount of pollutants emitted into the atmosphere,
6 the size and topography of the air basin, and the prevailing meteorological conditions. The
7 severity or nonseverity of a pollutant's concentration in a region or geographical area is
8 determined by comparing it with federal and/or state ambient air quality standards. Under
9 the authority of the Clean Air Act (CAA), the USEPA has established nationwide air quality
10 standards to protect public health and welfare with an adequate margin of safety.

11 The baseline standards for pollutant concentrations are the National Ambient Air Quality
12 Standards (NAAQS) and state air quality standards. These standards represent the maximum
13 allowable atmospheric concentration that may occur and still protect public health and
14 welfare. Further discussion of the NAAQS and state air quality standards are included in
15 Appendix D, *Air Quality*.

16 Based on measured ambient air pollutant concentrations, the USEPA designates whether
17 areas of the U.S. meet the NAAQS. Those areas demonstrating compliance with the NAAQS
18 are considered "attainment" areas, while those not compliant are known as "nonattainment"
19 areas. Those areas that cannot be classified on the basis of available information for a
20 particular pollutant are "unclassifiable" and are treated as attainment areas until proven
21 otherwise.

22 **Greenhouse Gases**

23 GHGs are chemical compounds in the earth's atmosphere that trap heat in the atmosphere,
24 thus regulating the earth's temperature. Gases exhibiting greenhouse properties come from
25 both natural and human sources. Water vapor, carbon dioxide (CO₂), methane (CH₄), and
26 nitrous oxide (N₂O) are examples of GHGs that have both natural and man-made sources,
27 while other gases such as those used for aerosols are exclusively man-made.

28 The six primary GHGs, which are internationally recognized and regulated under the Kyoto
29 Protocol, are CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur
30 hexafluoride (SF₆). There are other GHGs, such as water vapor and ozone, but for purposes of
31 this EIS, GHGs are defined in accordance with Section 19(i) of Executive Order (EO) 13514 as
32 the aforementioned primary six GHGs.

33 These six key GHGs have been found to threaten public health and welfare (USEPA's
34 Endangerment Finding). The state of Florida has taken steps to reduce GHG emissions over a
35 10-year period by adopting maximum emission levels for electric utilities and adopting
36 California motor vehicle emission standards. Detailed discussions of GHG regulations are
37 included in Appendix D, *Air Quality*.

3.5.1.2 Assessment Method

Air Quality

To evaluate air emissions and their impact on the overall region of influence (ROI), the emissions associated with the project activities were compared with the total county emissions on a pollutant-by-pollutant basis, using the USEPA's 2008 National Emissions Inventory (NEI) data (USEPA, 2012). The county data include emissions data from point sources, area sources, and mobile sources. "Point sources" are stationary sources that can be identified by name and location. "Area sources" are point sources of emissions too small to track individually, such as individual homes, small office buildings, or diffuse stationary sources (e.g., wildfires or agricultural tilling equipment). "Mobile sources" are vehicles or equipment with gasoline or diesel engines, e.g., an airplane or a ship. Two types of mobile sources are considered: on-road and nonroad. *On-road* mobile sources are vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. *Nonroad* sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2009).

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. [Table 3-18](#) defines how these impact attributes are applied to air quality and greenhouse gases.

For a conservative analysis, the affected counties were selected as the ROI instead of the USEPA-designated Air Quality Control Region (AQCR), which is a much larger area. Calculated air emissions were compared with the annual total emissions of Okaloosa and Santa Rosa Counties for BRSF activities. For operations on THSF, calculated air emissions were compared with the annual emissions for Franklin County.

The Air Conformity Applicability Model (ACAM) Version 4.5.0 was also utilized to provide a level of consistency with respect to emissions factors and calculations. The ACAM provides estimated air emissions from proposed federal actions in areas designated as nonattainment and/or maintenance for each criterion and precursor pollutant, as defined in the NAAQS. The ACAM provided user inputs for construction, grading, and paving activities; these inputs were then used to calculate emissions. Aircraft operations, vehicles, and munitions were calculated using emission factors and calculation methods from AP-42 and the *Air Emissions Guide for Air Force Mobile Sources*. The air quality analysis focused on emissions associated with the construction activities, flight operations, munitions, and vehicle use.

Greenhouse Gases

The potential effects of GHG emissions from the Proposed Action are by nature global. Given the global nature of climate change and the current state of the science, it is not useful at this time to attempt to link the emissions quantified for local actions to any specific climatological change or resulting environmental impact. Nonetheless, the GHG emissions from the Proposed Action and alternatives have been quantified to the extent feasible in this EIS for information and comparison purposes.

1 On February 18, 2010, the CEQ released its Draft NEPA Guidance on Consideration of the
 2 Effects of Climate Change and Greenhouse Gas Emissions, which suggests that proposed
 3 actions that would be reasonably anticipated to emit 25,000 metric tons or more of carbon
 4 dioxide equivalent (CO₂e) GHG emissions should be evaluated by quantitative and qualitative
 5 assessments. This is not a threshold of significance but a minimum level that would require
 6 consideration in NEPA documentation. The purpose of quantitative analysis of CO₂e GHG
 7 emissions in this EIS is for its potential usefulness in making reasoned choices among
 8 alternatives. [Table 3-18](#) defines how the impact attributes of context, intensity, and duration
 9 are applied to air quality analyses.

10

Table 3-18. Definitions of Impact Attributes for Air Quality Categories

Attribute	Air Quality	Greenhouse Gases
Contexts Analyzed		
Regional/population	Air Quality Control Region (AQCR); impacts to populations.	
Localized	County level area effects; impacts to small segments of affected population or individuals.	
Intensity (can be either adverse or beneficial)		
High	Substantive change in emissions in the region exceeding local air quality guidelines.	Change in regional greenhouse gas (GHG) emissions greater than 25,000 metric tons (27,557 tons).
Medium	Moderate change in emissions in the region near local air quality guidelines.	Moderate change in regional GHG emissions near local air quality guidelines.
Low	Slight change in emissions within local air quality guidelines.	Slight change in GHG emissions within local air quality guidelines.
Neutral	No perceptible increase in emissions.	
Duration		
Long term	Effect would likely endure for the life of the action	
Medium term	Effect would likely last for a few months to a year	
Short term	Effect would likely last for a few days to weeks	

11 3.5.1.3 Impact Levels

12 The level of impact associated with noise and the impact's potential significance is
 13 determined by considering how Proposed Action effectors could interact with the existing
 14 baseline noise environment and noise resource categories (e.g., context) in terms of intensity
 15 (e.g., Proposed Action noise levels) and duration as described in [Table 3-18](#). [Table 3-19](#)
 16 explains the levels of impacts for air quality analyzed in this EIS and identified in Chapters [4](#), [5](#),
 17 and [6](#).

18

Table 3-19. Impact Level Categories for Air Quality

Level of Impact	Air Quality	Greenhouse Gases
Adverse	Adverse impacts are associated with increases in air pollutant emissions such that emissions are comparable to air quality emission standards. Significant adverse impacts may occur under long- to medium-term, high-intensity impacts that result in exceedence of regional air pollutant emission guidelines and standards. Insignificant impacts may result from short- to medium-term, medium-intensity impacts that increase the regional air pollutant emissions but within regional air pollutant guidelines and standards.	
Neutral/no effect	Short-term impacts that result in minimal increase in regional air pollutant emissions.	

GHG = greenhouse gas

1 **3.5.2 General Emitter Activity Impact Assessment**

2 Based on the scope of action described in Chapter 2, emitter site use would not result in
 3 significant adverse impacts to air quality, because the emitter sites are located across a large
 4 area and would only produce small amounts of air pollutant emissions to the region from
 5 generator use. The use of temporary emitter sites would have no impacts to air quality at sites
 6 that have access to power. Transport of emitters to the sites and the use of generators would
 7 produce small amounts of emissions and would be expected to result in short-term impacts.
 8 Air emissions associated with emitter use are provided in Chapter 4, Section 4.5.

9 **3.5.3 General Training Activity Impact Assessment**

10 Air emissions would result from the following activities: land disturbance associated with land
 11 development for use of roadways for aircraft operations, ground movement (wheeled vehicle
 12 use), expendable use (training munitions), aircraft operations, and AO. Because the
 13 movements and use of each of the locations is not known, it was assumed that the maximum
 14 use of vehicles, expenditures, aircraft, and personnel would be used during each event.

15 **Land Disturbance**

16 Land disturbance emissions would result from the improvement of roadways for aircraft
 17 operations. Estimated air emissions have been calculated for this activity, and are provided in
 18 [Table 3-20](#). Air emissions calculations are provided in Appendix D, *Air Quality*.

19 **Table 3-20. Air Emissions from Land Clearing**

Source	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Land disturbance	<0.01	<0.01	28.6	<0.01	<0.01	<0.01	<0.01

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 micrometers or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

20 **Ground Movement**

21 Ground movement would result in fugitive dust and fossil fuel-use emissions from wheeled
 22 vehicles utilizing dirt roadways. Estimated air emissions have been calculated for these
 23 activities and are provided in [Table 3-21](#) and [Table 3-22](#). Air emissions calculations are
 24 provided in Appendix D, *Air Quality*.

25 **Table 3-21. Fugitive Dust Emissions**

Source	PM (tons/event)	PM (tons/year)
Cross-Country Vehicle Movement	0.91	3.65
Vehicle Stream and Wetland Crossing	0.91	3.65
Blackout Driving	0.25	1.01
Bivouacking/Assembly Areas	0.08	0.76
Communications and Surveillance Operations	0.08	0.91
Opposing Forces Vehicle Operations	0.89	29.27
Hardened Camp Site Use	3.55	6.86
Total	6.66	46.11

BRSF = Blackwater River State Forest; PM = particulate matter; ROI = region of influence

1

Table 3-22. Wheeled Vehicle Air Emissions

Source	Emissions (tons/event)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Cross-Country Vehicle Movement	2.74	0.01	0.09	0.10	0.00	2.87	9.76
Vehicle Stream and Wetland Crossing	2.74	0.01	0.09	0.10	0.00	2.87	9.76
Blackout Driving	0.76	0.00	0.03	0.03	0.00	0.80	2.71
Bivouacking/Assembly Areas	0.23	0.00	0.01	0.01	0.00	0.23	0.53
Communications and Surveillance Operations	0.23	0.00	0.01	0.01	0.00	0.23	0.53
Opposing Forces Vehicle Operations	0.05	0.15	0.01	0.01	0.01	0.01	15.90
Hardened Camp Site Use	0.20	0.61	0.03	0.03	0.05	0.03	63.59
Total/Event	6.95	0.78	0.27	0.29	0.06	7.03	102.79
Source	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Cross-Country Vehicle Movement	10.98	0.03	0.38	0.41	0.01	11.48	39.06
Vehicle Stream and Wetland Crossing	10.98	0.03	0.38	0.41	0.01	11.48	39.06
Blackout Driving	3.05	0.01	0.10	0.11	0.00	3.19	10.85
Bivouacking/Assembly Areas	2.28	0.01	0.07	0.08	0.00	2.28	5.28
Communications and Surveillance Operations	2.74	0.01	0.09	0.10	0.00	2.74	6.33
Opposing Forces Vehicle Operations	1.62	5.00	0.24	0.25	0.37	0.28	524.66
Hardened Camp Site Use	0.38	1.17	0.06	0.06	0.09	0.07	122.95
Total/Year	32.03	6.26	1.32	1.42	0.48	31.51	748.18

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

2 Expendable Use

3 Estimated air emissions have been calculated for training munitions use and are provided in
4 [Table 3-23](#). Air emissions calculations are provided in Appendix D, *Air Quality*.

5 **Table 3-23. Expendable Use Emissions**

Munitions Emissions	Emissions (tons)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOC	CO _{2e}
Estimated average/event	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Maximum emissions/year	0.18	0.02	0.75	0.21	0.00	0.00	0.35

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

6 Aircraft Operations

7 Aircraft operations would result in fossil fuel-use emissions from fixed- and rotary-wing
8 aircraft use. Estimated air emissions have been calculated for these activities and are
9 provided in [Table 3-24](#). Air emissions calculations are provided in Appendix D, *Air Quality*.

1

Table 3-24. Aircraft Emissions

Source	Emissions (tons/event)						
	CO	NO _x	PM _{2.5}	PM ₁₀	SO ₂	VOCs	CO _{2e}
Light Aviation Proficiency Training	0.12	2.49	0.33	0.37	0.56	8.03	1.79
Low-Level Helicopter Insertions/Extractions (LLHI/E)	0.04	0.12	0.03	0.03	0.01	0.01	9.98
Airdrops	0.09	0.43	0.11	0.12	0.02	0.00	19.95
Air/Land Vertical Lift	0.04	0.12	0.03	0.03	0.01	0.01	18.11
Forward Air Refueling Point/Hot Gas Operations	0.26	0.70	0.15	0.17	0.08	0.06	4.99
Overwater Hoist Operations	0.02	0.06	0.01	0.01	0.01	0.01	3.15
Hardened Camp Site Use	0.05	0.06	0.01	0.01	0.01	0.01	15.73
Total/Event	0.63	3.97	0.67	0.75	0.70	8.13	73.69
Aircraft Activity	Emissions (tons/year) ¹						
	CO	NO _x	PM _{2.5}	PM ₁₀	SO ₂	VOCs	CO _{2e}
Light Aviation Proficiency Training	27.84	2.49	0.33	0.37	0.56	8.03	414
Low-Level Helicopter Insertions/Extractions (LLHI/E)	0.51	1.41	0.30	0.34	0.16	0.12	120
Airdrops	21.49	99.20	24.66	28.95	5.66	0.53	4,629
Air/Land Vertical Lift	9.88	27.25	5.82	6.55	3.12	2.38	4,629
Forward Air Refueling Point/Hot Gas Operations	0.51	1.41	0.30	0.34	0.16	0.12	10
Overwater Hoist Operations	0.26	0.70	0.15	0.17	0.08	0.06	38
Hardened Camp Site Use	2.47	6.81	1.46	1.64	0.78	0.60	3,649
Total/Year	62.96	139.28	33.03	38.36	10.51	11.84	13,488

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

1. Total annual emissions were compared with the ROI for maximum impact analysis.

2 **Amphibious Operations**

3 AO requires the use of watercraft, which would result in fossil-fuel use related emissions.
 4 [Table 3-25](#) provides estimated air emissions from use of watercraft. Air emissions calculations
 5 are provided in Appendix D, *Air Quality*.

6 **Table 3-25. Amphibious Operations Emissions**

Source	Emissions (tons)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Amphibious Operations/event	0.00	0.00	0.00	0.00	0.05	0.44	0.00
Amphibious Operations/year	0.01	0.01	0.00	0.01	0.48	4.42	0.00

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

7 **3.5.3.1 General Training Activity Impact Assessment Summary**

8 [Table 3-26](#) provides a summary of general training activity impact analysis. Based on the
 9 impact assessment described previously, land development, use of wheeled vehicles,
 10 expendable use, and AO would all result in air emissions and are therefore carried forward for

1 site-specific analyses in Chapters 5 (BRSF) and 6 (THSF); these are shaded yellow. Activities
 2 shaded in green have little potential to impact public health or safety or the human and
 3 natural environment or do not result in potential violations of federal, state, or local
 4 regulations. Therefore, these activities are not carried forward for detailed analysis in
 5 Chapters 5 and 6.

6 **Table 3-26. Receptor and Effector Interactions for Air Quality and Greenhouse Gases**

Proposed Action Effector	Resource Area Potentially Affected (Receptor)	
	Air Quality	Greenhouse Gases
Land Disturbance		
Land development	The potential for adverse impacts has been identified associated with potential increases in air pollutant emissions from use of construction equipment. This issue area has been carried forward for site-specific analysis.	
Point impact	No interaction. These issue areas have not been carried forward for site-specific analysis.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	The potential for adverse impacts has been identified associated with air pollutant emissions from vehicle use. This issue area has been carried forward for site-specific analysis.	
Dismounted maneuver	No interaction. This issue area has not been carried forward for site-specific analysis.	
Us of Expendables		
Blanks/GBS	The potential for adverse impacts has been identified associated with air pollutant emissions released from munitions, smoke grenades, generators, etc. This issue area has been carried forward for site-specific analysis.	
Smoke grenades		
Other/equipment		
Aircraft Operations	The potential for adverse impacts has been identified associated with air pollutant emissions from aircraft engines operating below 3,000 feet above ground level (air mixing height). This issue area has been carried forward for site-specific analysis.	
Amphibious Operations	The potential for adverse impacts has been identified associated with air pollutant emissions from boat engines. This issue area has been carried forward for site-specific analysis.	
Utilities	No interaction. This issue area has not been carried forward for site-specific analysis.	

7 3.5.4 Proposed Resource-Specific Mitigations

8 Based on general impact analyses presented in Section 3.5, no Resource-Specific Mitigations
 9 have been identified for air quality.

10 3.6 EARTH RESOURCES

11 For purposes of this EIS, "earth resources" refers to the geologic and soil resources associated
 12 with the land areas proposed for use. Each of these earth resource components is referred to
 13 as a "receptor." Geologic resources are consolidated or unconsolidated earth materials,
 14 including ore and aggregate materials, fossil fuels, and significant landforms. Soil is a natural,
 15 three-dimensional material composed of solids (minerals and organic matter), liquid, and
 16 gases that occurs on the land surface. Soil is characterized by horizons or layers that are
 17 distinguishable from the parent material, either as a result of additions, losses, transfers,
 18 and/or transformations of energy and matter or the ability to support rooted plants in a
 19 natural environment (USDA, 2010).

1 **3.6.1 Impact Assessment Methodology**

2 The impact assessment for earth resources evaluates the potential impacts of the Proposed
3 Action on geology and soils. Impacts to these resources are evaluated according to type,
4 context, intensity, and duration (as described in Section [3.1](#)), as well as the regulatory drivers
5 identified below. Together, these attributes define the potential significance of the impacts.

6 **3.6.1.1 Regulatory Drivers**

7 For this assessment, regulations relating to earth resource impact potentials are primarily
8 associated with the effects of soil detachment (erosion) and deposition of materials
9 (sedimentation) on aquatic resource water quality and habitats, prime farmland soils, and
10 erodible land. For more information on federal and state water quality regulations refer to
11 Section [3.7.1.1](#), *Water Resources, Regulatory Drivers*. Laws and regulations applicable to the
12 Proposed Action for earth resources are summarized below.

13 • Prime farmland soils are protected under the Farmland Protection Policy Act (FPPA) of
14 1981. The U.S. Department of Agriculture defines prime farmland soils as those best
15 suited to food, feed, forage, fiber, and oilseed crops. Farming these soils produces the
16 highest yields with minimal energy and economic resources expenditures and the
17 least environmental damage. They are generally fertile, are not excessively erodible or
18 saturated by groundwater of flooding during the growing season, and slope generally
19 from 0 to 5 percent (USDA NRCS, 1995). For more information on prime and unique
20 farmlands see:

21 http://www.access.gpo.gov/nara/cfr/waisidx_99/7cfr657_99.html.

22 • "Erodible land" is defined by the Sodbuster, Conservation Reserve, and Conservation
23 Compliance parts of the Food Security Act of 1985 and the Food, Agriculture,
24 Conservation, and Trade Act of 1990. Determinations for highly erodible land are
25 based on an erodibility index as defined in the *National Food Security Act Manual*.
26 Policy and procedures for developing and maintaining highly erodible land are given
27 in Part 511 of the manual:

28 ftp://ftp.tx.nrcs.usda.gov/NHQ/programs/Appeals%20Training/FSANRCS_NAD_POLIC
29 Y/NFSAM_HEL_common.pdf.

30 The Proposed Actions would comply with established Division of Forestry and Air Force
31 resource management plans and instructions (e.g., EAFBI 13-212, Range Planning and
32 Operations, Chapter 7 – Environmental Management). These documents include planning
33 goals and activity directives relating to the management of earth resources and practices to
34 minimize and mitigate impacts.

1 **3.6.1.2 Assessment Method**

2 The assessment entailed evaluating impacts from the Proposed Action to earth resources on
3 BRSF and THSF. The assessment focused on potential physical and chemical damage to
4 geology and soils and subsequent impacts to water resources, such as sedimentation from
5 accelerated soil erosion and/or water contamination.

6 *Physical damage* includes disturbances to the structural and/or biological properties of soil or
7 geologic features that compromise their natural condition and function. Examples include
8 compaction, rutting, accelerated (human-induced) soil rill and gully erosion, and generation
9 of dust or mud. *Chemical damage* occurs when resources are chemically or biologically
10 altered due to the introduction of organic and inorganic materials (e.g., contamination of soil
11 and geologic features from chemical fluid leaks or spills).

12 *Soil erosion* is a three-phase process of detachment, transport, and deposition of surface
13 materials by water flowing over land. Erosion is difficult to control and easily accelerated by
14 humans. Accelerated erosion caused by humans occurs at rates much greater than under
15 natural erosion conditions. Large quantities of eroded soil sediment delivered to streams can
16 adversely affect channel morphology, degrade aquatic species habitats, and impair water
17 quality. Such sedimentation increases water column turbidity, alters water chemistry
18 parameters, and introduces chemical contaminants and other pollutants.

19 **Geologic Resources Addressed**

20 ***Karst Terrain***

21 Karst terrain is formed by the dissolution (chemical solution) of underlying soluble carbonate
22 rocks—primarily limestone and dolomite—by surface water and/or ground water. This
23 unique landscape is characterized by rapid permeability, as water flows through
24 interconnected subsurface voids. As weakly acidic stormwater migrates through soils and
25 rock fractures, it dissolves bedrock materials, creating solution pipes, cavities, caverns, and
26 sinkholes. Karst sinkholes occur when cavities, caverns, and/or solution pipes cause the
27 collapse of overburden materials into subsurface voids, creating depressions that can range
28 from a few feet to hundreds of feet in diameter. Because of their high permeability and lack
29 of a natural filtration system, karst areas are particularly vulnerable to pollution. In northwest
30 Florida, sensitive karst terrain frequently serves as recharge for the Floridan aquifer system.
31 Thus, pollution of karst areas could expose drinking water aquifers to contamination
32 (NFWFMD, 2010b; Southwest Florida Water Management District, 2007; Tihansky and
33 Knochenmus, 2001; Lane, 1986).

34 ***Closed Depressions***

35 A closed depression is a landform where the hill slopes encircle a common sediment
36 depository, and the sediment eroded from the surrounding hill slopes is trapped in the
37 system. These ground depression sinks function as reservoirs for stormwater runoff and
38 groundwater seepage and may hold water for extended periods of time.

1 **Soil Resources Addressed**

2 **Soil Inventories**

3 Soils were inventoried for Proposed Action
4 locations; highly erodible, potentially highly
5 erodible, and hydric soils (associated with
6 wetlands and floodplains) are identified.

7 Some shallow gradient terraces, flats,
8 depressions, and floodplain wetlands that
9 exhibit fluctuating near-surface water tables
10 and/or frequent-to-occasional flooding exhibit
11 wet soil conditions are classified as hydric soils.

12 These soils are under conditions of saturation,
13 flooding, or ponding long enough during the growing season to develop anaerobic (lacking
14 oxygen) conditions in the upper part (USACE, 1987) (see photo of Wetland Hydric Soils). Due
15 to fluctuations in surface and subsurface hydrology, some hydric soils may have nonhydric
16 phases. Hydric soils are used as an indicator to identify and classify jurisdictional wetlands
17 (see Section [5.7.1](#)).

18 In addition, prime farmland areas were identified. Timber production qualifies as farmed land
19 under the Farmland Protection Policy Act (see Section [3.6.1.1](#), *Regulatory Drivers*), whereas
20 urban areas or built-up land of 10 acres or more are not considered prime farmland.

21 **Erodible Soils**

22 The Natural Resources Conservation Service estimates which soils are highly erodible or
23 potentially highly erodible due to sheet and rill erosion. These estimates are primarily based
24 on the Revised Universal Soil Loss Equation (RUSLE). This model utilizes soil, topography,
25 rainfall, and land cover management variables to predict soil erodibility. A "highly erodible"
26 soil has a maximum potential for erosion that equals or exceeds eight times the tolerable
27 erosion rate. In addition to the dominance of sandy soil, extensive areas that are moderately
28 to steeply sloped strongly affects the erodibility of forest soils.

29 Soil erodibility is only one component of the soil erosion process. The disturbance or loss of
30 vegetative cover determines the extent to which erodible soils become erosive and exhibit
31 sheet, rill, and/or gully features that can generate and transport sediment. Depending on site
32 variables, sediments may remain on-site or be transported great distances.

33 **Natural Soil Erosion Sources**

34 Natural erosion sources are those that occur as part of natural processes. Human interaction
35 tends to accelerate or exacerbate natural erosion processes.



Wetland Hydric Soils (Photo by Mike Rainer)

1 [Streambanks](#)

2 Under natural conditions, streambank instabilities occur as a result of channel entrenchment
3 and scouring of bendway cutbanks. Bank retreat primarily results from mass failure of
4 overheightened and oversteepened banks. Scour of the riverbed and bank toe increases the
5 bank height and slope angle, decreasing its stability. Noncohesive bank materials, such as
6 sandy soils, tend to fail from bank slides and sloughing as the soil particles lose their shear
7 strength because of saturation. Site-specific failure mechanisms depend on the topography
8 (height and steepness) and stratigraphy of the bank and the physical properties of the bank
9 soils (Shields et al. 1995).

10 Sources of streambank instabilities include highly permeable and erodible characteristics of
11 sandy geologic formations and human-induced sedimentation associated with land uses
12 such as silviculture, borrow pits, unpaved road crossings, and other activities (Hollie et al.,
13 2010). Heavy sediment loading of streams can reduce channel depth, which can widen the
14 stream and increase channel flows, putting greater pressure on streambanks and resulting in
15 accelerated bank erosion. Unstable streambanks are also sensitive to human ingress and
16 regress activities that could increase soil loss.

17 [Steepheads](#)

18 *Steepheads* are self-sustaining ecosystems created from the bottom up by a process known as
19 “spring sapping.” These springs give rise to many small streams and create small box canyons
20 that are notched into the edges of the flat uplands. Their formation begins with valley-head
21 soil erosion at the point of groundwater
22 discharge, followed by headwall slumping
23 that creates a semicircular box canyon
24 configuration. The sandy clays near the
25 surface remain vertical, while the underlying
26 softer sands near the spring wash away.
27 Typically, northwest Florida steepheads range
28 from 50 to 70 feet deep and 100 to 200 feet
29 wide and have side slopes with gradients
30 exceeding 50 percent (Photo: Steephead Box
31 Canyon Slopes).



Steephead Box Canyon Slopes (Photo by Mike Rainer)

32 Because of their steep slopes, steephead
33 canyons are highly susceptible to human-induced surface erosion. As exemplified in the
34 photos below (*Eroded Steephead Slopes, Santa Rosa County, Florida 1930 and Okaloosa County,*
35 *Florida, 2005*), ground disturbances that remove vegetative cover and/or concentrate surface
36 runoff can cause catastrophic gully erosion that may damage or destroy these unique
37 ecosystems.



Eroded Steephead Slopes, Santa Rosa County, Florida, 1930 (State Archives of Florida) **and Okaloosa County, Florida, 2005** (Photo by Mike Rainer)

1 [Gulf Coastline Erosion](#)

2 Beach erosion (shoreline retreat) and sediment accretion (shoreline advance) are ongoing
3 natural processes along the Gulf of Mexico coastline. The dynamic coastal environment of
4 beaches and sand dunes is subject to drastic changes, particularly during tropical storms and
5 hurricanes. During these events, extensive amounts of soil materials are subject to
6 suspension, transport, and deposition by high winds, storm surge, tides, waves, and
7 nearshore circulation. In extreme cases, enough beach sand may be eroded to expose
8 ancient tree stumps.

9 ***Accelerated Soil Erosion Sources***

10 Accelerated erosion sources are those that result from human interaction with earth
11 resources.

12 [Borrow Pits](#)

13 Borrow pits are open mines used primarily as sources of sand and clayey materials for
14 unpaved road maintenance and reconstruction (Hollie et al., 2010). These pits are potential
15 sources of severe soil erosion and sedimentation. This fact is due to their state of perpetual
16 surface disturbance, bare surface conditions, common location in proximity to waterways,
17 accumulations of loose soil materials, and exposure of relatively impervious soil layers.

18 [Unpaved Roads and Crossings](#)

19 Places where roads cross streams and wetlands are representative of human imprinting on
20 the landscape and the resulting impacts on natural resources. In particular, unpaved roads
21 and crossings severely impact aquatic ecosystems. Crossings allow contaminants and
22 sediments suspended in stormwater runoff to discharge directly into receiving waters.
23 Sedimentation caused by unpaved road crossings can result in violations of environmental
24 laws governing water quality, listed species, and their habitats. In some cases, impacts from
25 such sedimentation are catastrophic to aquatic ecosystems.

26 [Table 3-27](#) defines how the impact attributes of context, intensity, and duration are applied to
27 earth resource analyses.

1

Table 3-27. Definitions of Impact Attributes for Earth Resources

Attribute	Earth Resources
Contexts Analyzed	
Regional	Sediment generated by the disturbance source rill and/or gully erosion features is discharged off-site onto adjacent land areas, water bodies, and/or watershed streams, and/or karst disturbance creates a subsidence closed depression or sinkhole incident that could adversely impact basin- or subbasin-level hydrology.
Localized	Soil damage alters surface/geohydrology patterns; sediment generated by sheet/rill erosion remains on-site in close proximity to the disturbance source and is not discharged into water resources, and/or impacts to hydrology from karst disturbance are limited to the immediate watershed area.
Site-specific	Soil compaction/rutting damage, erosion and sediment, and/or karst area disturbances would affect a relatively small area, may not affect the immediate surroundings, and would not extend beyond the site of disturbance.
Intensity (can be either adverse or beneficial)	
High	Impact site disturbances are extensive: 1) prominent areas of compacted/rutted soil and/or gully features would deliver sediment off-site that may smother terrestrial vegetation or is discharged into water resources, a violation of state and/or regulations; 2) physical damages would alter existing karst topography and geohydrology and could lead to the development of closed depressions or sinkholes; and/or 3) soil contamination would create toxic site conditions and contaminants would likely move off-site and/or into groundwater. Mitigations are required to avoid impact effects.
Medium	Impact site exhibits any or all of the following: 1) Prominent area(s) of compaction/rutting and/or gully features are present; however, generated sediment primarily remains on-site. 2) Disturbance would alter existing karst area surface and surface landform topography. 3) Soil contamination would alter soil chemistry and diminish soil productivity and/or biology. Mitigations may be required to avoid impact affects.
Low	Impact site exhibits: 1) soil compaction/rutting damage and/or sheet/rill erosion features are present but would quickly stabilize or be mitigated by on-site personnel or consultations with regulatory agencies; 2) karst area disturbances would be limited to the surface and would not alter existing karst topography or geohydrology; and/or 3) contamination may affect soil biology, but soil chemistry and productivity would not be altered. Constraints and/or mitigations may be required.
Neutral	Impact site exhibits: 1) small areas of ground disturbance and the effects of erosion are imperceptible; no distinguishable erosion features would form; 2) site disturbance would not affect or alter existing karst topography or geohydrology; and/or 3) soil contamination would not alter site soil chemistry, biology, or productivity. No mitigations are required.
Duration	
Long term	Effect of gully soil erosion features and/or karst area disturbance and contamination effects would persist for the duration of the program or beyond.
Medium	Effect of rill and/or gully soil erosion features and karst area disturbance and contamination effects would stabilize within months to years.
Short term	Effect of sheet and/or rill soil erosion features and karst area disturbance would stabilize within weeks to months.

2 **3.6.1.3 Impact Levels**

3 The level of impact associated with earth resources and the impact's potential significance is
4 determined by considering how Proposed Action effectors could interact with earth
5 resources in terms of context, intensity, and duration as described in [Table 3-27](#). [Table 3-28](#)
6 explains the impact level categories for earth resources analyzed in this EIS and identified in
7 Chapters [4](#), [5](#), and [6](#).

1

Table 3-28. Impact Level Categories for Earth Resources

Attributes	Earth Resource Impact Evaluation Criteria
Adverse	Adverse impacts to earth resources may result in physical and chemical damage to geology and soils and subsequent impacts to water resources, such as sedimentation from accelerated soil erosion and/or water contamination. The level of impact would be directly related to the impact attributes described in Table 3-27 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration when the effect(s) are only partially reversible or irreversible with mitigation. Insignificant impacts may occur under medium- to low-intensity scenarios of short duration where disturbances would be limited to the surface and soil chemistry and productivity would not be altered. Impact affects could be reversed with appropriate mitigation measures.
Neutral/no effect	Ground disturbances would be limited to small areas with imperceptible erosion. Karst topography, geohydrology, and/or site soil chemistry, biology, or productivity would not be altered or affected.

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3.6.2 General Emitter Activity Impact Assessment

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Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to earth resources. The proposed emitter sites are located on existing developed sites that have established access and operational utilities. Expenditure of EMR and entry, positioning, and removal of mobile radar equipment would have no impact on earth resources. There may be site-specific, neutral land development and point disturbance impacts associated with tree clearing and installation of fencing at some locations. However, any land development activities may potentially occur at only two sites and would be less than half an acre in size. The scope of potential land development activities at these sites would be minor, and insignificant. Emitter site activities have little potential to impact public health or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for site-specific analysis in Chapter 4.

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3.6.3 General Training Activity Impact Assessment

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Point impacts, consumption, and incidental land disturbance would have no adverse impact on soils. Point impacts and ISD could increase the potential for soil compaction and accelerated soil erosion. It is anticipated that physical damage impacts to earth resources associated with point impacts and ISD would be insignificant, unlikely, short-term, site-specific, and neutral. Consumption activities would result in negligible site-specific physical damage to earth resources. Digging would be limited to point impact removal of individual plant roots by training personnel. Disturbances from point impacts, ISD, and consumption would be expected to recover naturally. HLZ activities would utilize sites previously cleared by the FFS and would not be expected to have an adverse impact on soils. These activities are not addressed further in the analysis.

26

Land Disturbance

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Land development associated with aircraft operations on unpaved roads has the potential for adverse soil erosion impacts.

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Military fixed-wing aircraft landing requirements include a 30-foot-wide landing zone (15 feet each side of the FWALS centerline) and a 27-foot-wide Zone A (edge of landing zone to the edge of Zone B), an exterior Zone B that is 6 feet wide from the edge of Zone A (AFSOC, 2011), and an FWALS length of 2,000 feet. The total FWALS footprint (including roadway) would be

1 approximately 4.4 acres. Other than road maintenance grading and roadside bushhogging,
2 no additional ground activities have been identified to modify or reconstruct existing
3 roadway and roadside areas to meet military FWALS standards and requirements.

4 To convert these roads into FWALS that meet AFSOC standards (AFSOC, 2011), the existing
5 roadways would have to be rebuilt. This would include:

- 6 • Widening the roadway an additional 12 feet for the landing zone.
- 7 • Establishing roadside graded and maintained clear areas (Zones A and B).
- 8 • Reconstructing the roadway subgrade and surface grade to aircraft landing zone
9 design standards.

10 Based on military FWALS landing zone requirements (1.38 acres), the estimated roadway size,
11 and the above analysis scenario (0.8 acres), approximately 0.6 acres of potentially semi-
12 disturbed roadside soils could be impacted during construction (roadsides are typically bush
13 hogged as part of normal management operations). The total area of FWALS lateral clearance
14 zones would be about 3 acres – these zones would be cleared as part of normal forestry
15 operations; the Air Force would not clear any areas in support of aircraft operations. Given
16 that potential land disturbance associated with aircraft operations would be less than 1 acre
17 and would occur within established roadbeds, no NPDES permitting requirements have been
18 identified.

19 Land improvement activities would be conducted within the disturbed roadway and roadside
20 area soils. Landing zone stabilization may include road soil excavation to design depth and
21 reconstruction of the subgrade and surface grade to engineered specifications. Based on site
22 conditions, the depth of soil excavations could range from 0 to 24 inches. Imported soil
23 and/or aggregate fill materials may be required to stabilize the landing zone subgrade and
24 surface course. The scope and extent of reconstruction would depend on site-specific
25 features and conditions.

26 For purposes of analysis, the suitability for roads (natural surface) rating system developed by
27 the U.S. Department of Agriculture, Natural Resources Conservation Service was used as a
28 comparable alternative, since the proposed FWALS would be constructed on existing
29 unpaved roads. The ratings are based on slope, rock fragments on the surface, plasticity
30 index, content of sand, the soil's designation per the Unified Soil Classification System, depth
31 to water table, ponding, flooding, and the hazard of soil slippage. Suitability rating classes
32 include the following:

- 33 • *Well suited* indicates that the soil has features that are favorable for the specified kind
34 of roads and has no limitations. Good performance can be expected, and little or no
35 maintenance is needed. These are associated with LU-2 areas. Improvements in these
36 areas may involve land disturbance activities outside the roadbed as identified
37 previously, but no land clearing would occur; any land disturbance would require
38 approval and coordination with the FFS.
- 39 • *Moderately suited* indicates that the soil has features that are moderately favorable for
40 the specified kind of roads. One or more soil properties are less than desirable, and fair
41 performance can be expected. Some maintenance is needed. These are associated
42 with LU-2 areas. Improvements in these areas may involve land disturbance activities

1 outside the roadbed as identified previously, but no land clearing would occur; any
2 land disturbance would require approval and coordination with the FFS.

- 3 • *Poorly suited* indicates that the soil has one or more properties that are unfavorable for
4 the specified kind of roads. Overcoming the unfavorable properties requires special
5 design, extra maintenance, and costly alteration. These are associated with
6 Prohibited, Restricted, and LU-1 areas. Aircraft operations within these areas can only
7 be established on existing roadways that do not require land disturbance outside the
8 existing road bed or right-of-way. This limits the potential for adverse impacts
9 associated with soil erosion, and minimizes the need for excessive maintenance.

10 Proposed HLZ/DZ-based aircraft landing activities include A/LVL and LLLHI/Es training at
11 existing cleared areas, primarily clearcuts, in various locations at both forests (see
12 Section [2.3.2.1](#)). All forest tactical areas are candidate locations. No landing strips, helicopter
13 pads, or other construction activities would be required to prepare selected sites. For safety
14 and operational reasons, aircraft landings would take place on relatively level ground that is
15 less prone to unstable soil conditions and soil erosion than steeper sites.

16 Clearcuts often exhibit extensive coverage by young vegetative growth, woody debris, slash,
17 and near-ground-level tree stumps for several years after harvesting. If root raking is not
18 conducted in preparation for replanting, ground stabilizing root systems of woody trees and
19 shrubs generally remain intact. The type and density of organic matter varies between site
20 locations and generally depends on the pre-harvest timber basal area, available seed sources,
21 soil productivity and bulk density, and post-harvest management practices. As needed, the
22 FFS implements silviculture BMPs to repair damaged areas, improve soil stability, and
23 promote plant growth following timber harvesting.

24 Potential impacts to earth resources include soil compaction, rutting, and erosion. Areas
25 prone to physical damage from compaction are the undisturbed ground adjacent to the
26 existing roadway that could be incorporated into the landing zone. The effects of
27 undisturbed ground compact would extend for the life of the FWALS landing zone. After
28 FWALS improvement, affected roadways would continue to function as components of the
29 forest road network. Soil rutting would most likely occur within the lateral clearance zones
30 during maintenance activities under saturated soil conditions. Since area slopes are relatively
31 minor and there are no road-stream crossings within the proposed footprint, construction-
32 induced soil erosion would be limited to the immediate area and would not likely affect water
33 resources.

34 **Ground Movement**

35 ***Wheeled Vehicles***

36 All wheeled-vehicle movements would be conducted on existing roads within all use areas
37 with noted general and site-specific constraints and mitigations identified in Sections [2.5](#), [2.7](#),
38 and [3.6.4](#), respectively. Therefore, no impacts to off-road areas would occur. The stabilized
39 asphalt and concrete surfaces of paved roads would not be adversely impacted by mounted
40 troop vehicle movements; therefore, they were excluded from further analysis.

41 Proposed use of unpaved roads and crossings could degrade and destabilize unpaved road
42 soil or aggregate surfaces, which could increase soil erosion and sedimentation. However,
43 the proposed mission frequency of three training events per quarter would likely not exceed

1 the carrying capacity of available unpaved roads or be greater than the current level of
2 vehicle use. The BRSF uses standard unpaved road and roadside best management practices
3 (BMPs) to repair and stabilize roads (FDACS, 2013).

4 Vehicle traversing of low-water crossings could destabilize road approach slopes and increase
5 soil erosion. Based on available evidence, most low-water crossings at BRSF are unimproved;
6 where improvement does occur, it likely is limited to lining the streambed with rocks. In
7 some cases, the section of the road close to the stream may be amended with gravel or
8 crushed rock to reduce soil loss and road degradation. Because of stream proximity, road
9 bank soils dislodged by vehicle wheels could readily enter the waterway as sediment.
10 Generally, the potential sources of sediment are limited to the portions of the road in
11 immediate contact with the water course and the distance of road slopes from the gradient
12 crest to the stream. Driving through a stream also mobilizes streambed sediments.

13 ***Dismounted Movement***

14 Dismounted troop movements include on-and off-road maneuvers and bivouac, hardened
15 camp, and assembly area field operations associated with CCDM, B/AA, HCSU, and TCSA.
16 During CCDM training, troops move on foot cross-country, whereas the other three training
17 events involve troop movements within temporary or established camps. Dismounted
18 movement may occur in all use areas (except prohibited and restricted use areas), with noted
19 constraints and mitigations identified in Sections [2.5](#), [2.7](#), and [3.6.4](#), respectively (e.g.,
20 establishment of bivouac areas utilizing tent stakes may only occur in LU- 2 areas). All tactical
21 areas are potentially affected by dismounted troop movements.

22 Ground disturbance or trampling during troop movement can result in soil compaction,
23 increasing soil bulk density (reduced soil pore space), decreasing rate of water infiltration into
24 soil, increasing stormwater runoff and soil erosion potentials, and reducing vegetation
25 germination and growth. As activity becomes concentrated into smaller areas, the potential
26 for soil damage tends to increase. Numerous investigations of recreational sites have found
27 that concentrated foot traffic can significantly increase soil bulk density. As with vehicles, soil
28 damage is most severe under wet soil conditions (Whitcotton et al., 1999; Whitcotton et al.,
29 2000). Reduced infiltration rates are one of the most detrimental consequences of trampling-
30 induced soil compaction (Cole, 1982). Studies have shown that trampling impacts are
31 generally most prevalent in the upper 6 inches of soil (Whitcotton et al., 2000). Use of
32 developed recreational camp sites can result in the loss of soil protecting ground cover and
33 initiate transitions to disturbance-tolerant plant communities (LaPage, 1967).

34 Based on the anticipated number of troops, extent of available area, and intensity of
35 trampling, bivouacs and assembly areas, combat support areas, and hardened camp sites are
36 rated as low- moderate-, and high-use activities, respectively. Except for hardened sites, the
37 location of camp sites could change as needed. For all but the hardened camp sites,
38 disturbances would be limited to driving tent stakes into the ground; no other digging or
39 ground disturbance would occur. Since hardened camp facilities have previously been
40 constructed, no additional ground disturbances are anticipated. During cross-county
41 maneuvers, soldiers could move through wetlands and/or cross streams and would likely use
42 established roads and trails as needed. All support vehicles would remain on designated
43 roads.

1 *Dismounted Troop Movements Determination:* Troop movements would impact forest soil
2 and/or geologic resources. Impacted areas would likely exhibit increased soil bulk densities
3 and reduced infiltration that could increase soil erosion. Under the Proposed Action, it is
4 anticipated that:

- 5 • Cross-country maneuver impacts would be adverse, probable, short term, site specific,
6 neutral, fully reversible, and insignificant.
- 7 • Temporary low-use bivouac and assembly area impacts would be adverse,
8 unavoidable, short-term, low intensity, fully reversible, and insignificant.
- 9 • Temporary moderate-use TCSA impacts would be adverse, unavoidable, medium
10 term, localized, fully reversible, and insignificant. Soil compaction impact mitigations
11 may be required for moderate-use camp sites (see Section [3.6.4](#)).
- 12 • Permanent, high-use hardened camp site impacts would be adverse, unavoidable,
13 medium-term, localized, fully reversible, and insignificant. Since these are permanent,
14 maintained facilities, no additional mitigations would be required.

15 The U.S. Department of Agriculture, Natural Resources Conservation Service has developed a
16 system to rate the suitabilities and limitations for establishing bivouac areas. The
17 interpretation identifies topographic and soil properties that affect the ease of establishing
18 bivouac sites. In developing bivouacs, slope, soil properties, wetness, and depth to cemented
19 soil pans are primary concerns:

- 20 • *Not limited* – The soil has features very favorable for the specified use; good
21 performance and very low maintenance can be expected.
- 22 • *Somewhat limited* – The soil has features that are moderately favorable for the
23 specified use. Limitations can be overcome or minimized by special planning, design,
24 or installation procedures; these are associated with LU-2 areas.
- 25 • *Very limited* – The soil has one or more features that are unfavorable for the specified
26 use. The limitations generally cannot be overcome without major soil reclamation,
27 special design, or expensive installation procedures. Poor performance and high
28 maintenance can be expected; these are associated with Prohibited, Restricted, and
29 LU-1 areas.

30 Constraint areas where mission impact-induced earth resource effects are most likely to occur
31 include closed depressions, steepheads, and hydric and erodible soils. Steepheads and
32 closed depressions represent locations where steep slopes and sustained wet soil conditions
33 are sensitive to soil disturbances from troop movements. These would mostly likely occur.
34 Recommendations to minimize impacts to earth resources are presented in Section [3.6.4](#).

35 **Expendable Use**

36 For comparative analysis, the proposed mission impacts of expendable use on earth
37 resources were examined against those detailed in the *Interstitial Area Range Final*
38 *Environmental Assessment Revision 2* (U.S. Air Force, 2013c). Based on the similarity between
39 the types and number of expendables, it is anticipated that earth resource impacts from
40 exposures to the munitions expenditures under the Proposed Action would be insignificant,
41 possible, short-term, site-specific, and neutral. Therefore, munitions use has not been carried
42 forward for further site-specific analysis.

1 Fueling operations are prohibited in all areas except LU-2 areas. FARP/HGO activities may
2 only occur on hardened surfaces (e.g., concrete or asphalt), and are not likely to occur in the
3 forests. Impacts could result from accidental fuel spills during equipment refueling due to
4 equipment failures or human error. Incidental engine and equipment leaks may also occur
5 during normal operations. Introduction of fuels into the soil could contaminate the soil and
6 groundwater. Such contamination could create soil conditions toxic to vegetation, both in
7 establishment and growth. Subsequent loss or decreased vigor of vegetative cover could
8 increase soil susceptibility to ground disturbance (erosion, compaction, and/or rutting).
9 Contamination of water resources and impacts from hazardous materials are discussed in
10 Sections [5.7.2](#) and [5.12.2](#), respectively.

11 Although spills and leaks could occur, it is anticipated that spills during refueling would be
12 rare, since refueling is conducted under strenuous process protocols for safety and accident
13 prevention. Best practices to prevent and rapidly respond to spills, as outlined in the *Eglin Air*
14 *Force Base Oil and Hazardous Substance Contingency Plan*, would be implemented during
15 refueling to prevent accidents and reduce impacts. In addition, each MFT carries a copy of an
16 oil spill response plan. Personnel verify proper operation of tanker truck level gauges, pumps,
17 hoses, and valves prior to transferring fuel. During product transfer, drip pans are placed
18 under connections and personnel note the proximity of any roadside drains along established
19 FWALS. MFTs are equipped with vehicle brake systems that prevent the vehicle from
20 departing before fuel hoses are disconnected. In the event that a spill does occur, MFTs are
21 equipped with spill kits that can be used to absorb and remove any fuel spilled during
22 product transfer.

23 **Aircraft Operations**

24 During training events, aircraft landing wheels or struts would rest on the surface and
25 disperse the full weight of the aircraft at these contact points. Depending on the aircraft, the
26 fully loaded weight can range from a few thousand to tens of thousands of pounds. For
27 comparison, the loaded weight of a loaded CV-22 Osprey is approximately 47,500 pounds and
28 the operational weight of a wheeled logging skidder ranges from 45,500 to 51,500 pounds.

29 During HLZ/DZ, A/LVL, and LLHI/E aircraft landings, soil compaction or rutting could occur at
30 the aircraft wheel or strut ground contact points. The extent of soil damage from compaction
31 or rutting would increase under wet soil conditions (Xu et al., 1999), particularly in areas with
32 hydric soils where seasonal high water tables are near the surface. Low soil moisture content
33 is likely instrumental in reducing soil compaction. Under comparable conditions, silt and clay
34 soils generally compact more severely than sandy soils (Amup, 1998).

35 The infrequent occurrences and distribution of aircraft landing events at various forest
36 locations would minimize repeated impacts at site-specific contact points. Accounting for soil
37 trafficking impacts associated with timber clearcut logging, aircraft landing-induced
38 disturbances would not be considered detrimental. Landing site damage would likely
39 recover through natural attenuation, and site vegetative cover and soil productivity would
40 likely not be diminished. After about five years, the density and height of woody vegetation
41 of some sites may hamper performance during some training activities, and troops may stop
42 using these sites.

43 Mission-related impacts to earth resources are more likely in certain constraint areas. Such
44 areas include closed depressions, steepheads, and hydric and erodible soils. These areas

1 represent locations where steep slopes and sustained wet soil conditions are most sensitive
2 to soil disturbances from landings. Recommendations to minimize constraint area impacts
3 are presented in Section [3.6.4](#).

4 In extreme cases, structural damage to soils may occur. This damage requires intervention to
5 accelerate site recovery from rutting, encourage revegetation, and prevent erosion. This
6 uncommon condition may occur during landings of fully-loaded aircraft during wet periods
7 when the surface soil is saturated or on hydric soils when water tables are within 6 inches of
8 the surface. Determinations of damage requiring site repair would be made by on-site
9 personnel.

10 Land suitabilities and limitations for HLZs are the same as those identified previously under
11 Dismounted Movement. The interpretation identifies topography, soil properties, and
12 flooding or ponding that may restrict the periods when the HLZ could be used.

13 **Amphibious Operations**

14 Boat and troop egress and ingress activities would occur along the banks and shorelines of
15 available training areas within all use areas (except prohibited areas and RAs), at sites
16 designated by the GLI Liaison and the FFS. Activities would occur with consideration of the
17 General Operational Constraints discussed in Section [2.5](#). During training events, foot traffic
18 and movement of boats in and out of the water would be concentrated in a relatively small
19 area at the water edge. AO could disturb soils and trample vegetation, resulting in conditions
20 that may result in accelerated bank erosion. Whether over natural ground or constructed
21 boat launch, areas repeatedly used would be more prone to exhibit adverse effects on soils.
22 In shallow areas, boat operations can also disturb bank and stream bottom sediments,
23 thereby increasing water column turbidity.

24 On streambanks and shorelines with established vegetation and stable grades (not
25 overheightened or oversteepened), impacts would consist of minor disturbances that, in
26 most cases, would naturally recover. Operations conducted at hardened boat launches
27 would not likely increase streambank degradation or soil loss.

28 **3.6.3.1 General Training Activity Impact Assessment Summary**

29 Based on the scope of action described in Chapter [2](#), all training activities except for OHO
30 would have at least some interaction with earth resources. [Table 3-29](#) identifies potential
31 interactions between Proposed Action effectors and earth resource receptors carried forward
32 for detailed analyses in Chapters [5](#) and [6](#) (highlighted yellow). Activities shaded in green have
33 little potential to impact public health or the human and natural environment or little
34 potential to result in violations of federal, state, or local regulations. Therefore, these activities
35 are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

Table 3-29. Receptor and Effector Interactions for Earth Resources

Proposed Action Effector	Earth Resource Area Potentially Affected (Receptor)
Land Disturbance	
Land development	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. Potential soil erosion impacts associated with roadside bushhogging and road grading for Fixed-Wing Aircraft Landing Sites; no construction activities would be conducted to modify or otherwise reinforce existing unpaved roads.
Point impacts	Potential for soil compaction and accelerated soil erosion. It is anticipated that physical damage impacts to earth resources associated with point impacts and ISD would be insignificant, unlikely, short-term, site-specific, and neutral. This issue area has not been carried forward for site-specific analysis.
Incidental surface disturbance	
Consumption	It is anticipated that physical damage to earth resources would be insignificant, probable, short-term, site-specific, and neutral. Digging would be limited to point impact removal of individual plant roots by training personnel. This issue area has not been carried forward for site-specific analysis.
Ground Movement	
Wheeled vehicles	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. Potential for soil compaction, rutting, and accelerated soil erosion associated with ISD on roadways. Additionally, soil/water contamination from fuels and other materials on roadways and in parking areas.
Dismounted maneuver	Potential for soil compaction and accelerated soil erosion associated with ISD. This issue area has been carried forward for site-specific analysis.
Use of Expendables	
Blanks/GBS	For comparative analysis, the proposed mission impacts of expendable use on earth resources were examined against those detailed in the <i>Interstitial Area Range Final Environmental Assessment Revision 2</i> (U.S. Air Force, 2013c). Based on the similarity between the types and number of expendables, it is anticipated that earth resource impacts from exposures to the munitions expenditures under the Proposed Action would be insignificant, possible, short-term, site-specific, and neutral. This issue area has not been carried forward for site-specific analysis.
Smoke grenades	
Other/equipment	No adverse impacts identified. There are potential impacts from spills while handling fuels. However, implementation of required spill control and response procedures would minimize this potential (see Section 3.12, <i>Solid and Hazardous Materials/Waste</i>). This issue area has not been carried forward for site-specific analysis.
Aircraft Operations	The potential for adverse impacts has been identified associated with soil compaction, rutting, accelerated soil erosion, and soil/water contamination from landing/takeoff and refueling activities. This issue area has been carried forward for site-specific analysis.
Amphibious Operations	The potential for adverse impacts has been identified associated with accelerated soil erosion along streambanks from ingress/egress along shorelines. This issue area has been carried forward for site-specific analysis.
Utilities	No interaction with earth resources. This issue area has not been carried forward for site-specific analysis.

ISD = incidental surface disturbance

3.6.4 Proposed Resource-Specific Mitigations

Based on the general impact analysis presented in Section 3.6, the following Proposed Resource-Specific Mitigations have been identified to further minimize potential impacts to earth resources:

- Conduct site fingerprinting of each proposed location to collect the data necessary to develop and implement FWALS project plans. *Site fingerprinting* is a data collection, ground-truthing, and reporting process designed to gather and analyze the field data necessary to plan, design, and construct FWALS to fully support the proposed military

1 aircraft training activities. Site data collection tools and protocols are used during field
2 visits to gather critical roadway and affected area measurements, photopoint records,
3 and soil samples. Based on validated field features and conditions, determinations can
4 then be made as to site suitability and engineering requirements. As needed, site
5 project plans could then be developed to meet site construction and operational
6 needs.

- 7 • Utilize sites that are best suited to the intended activity and avoid areas with known
8 constraints or limitations.
- 9 • Temporally and spatially disperse FWALS and HLZ/DZ training to minimize repetitive
10 use impacts to landing zone surface conditions and maximize life cycles. Utilize
11 mission logistics information to plan training events that avoid, to the degree possible,
12 FWALS used during the previous year and HLZ/DZ areas used during the previous two
13 years. A rest period would promote vegetative growth and allow disturbed areas to
14 recover.
- 15 • Construct and maintain an FWALS drainage system that collects and discharges
16 stormwater runoff in a non-erosive manner.
- 17 • Inspect FWALS landing zones following each training mission. Coordinate immediate
18 repairs of damaged areas.
- 19 • Avoid clear zone maintenance during wet soil conditions. All soils are highly sensitive
20 to mechanical compaction or rutting damage when wet.
- 21 • As needed, install BMPs to minimize soil disturbances (FDACS, 2008; USACOE, 2004;
22 USACOE, 2008). For clear zone sites with extreme rutting damage, physically amend
23 damaged soils with tillage equipment after the soils have dried. Depending on extent
24 of damage, soil structure amendments could be made with hand tools or motorized
25 tillage equipment. Areas may also need to be reseeded to native species to reduce
26 bare ground and encourage the establishment of soil protecting ground cover.
- 27 • Avoid HLZ/DZ areas with highly and potentially highly erodible soils and hydric soils.
28 Soil erosion potentials increase with increasing soil erodibility and wet soil are highly
29 sensitive to damage by compaction and rutting.
- 30 • Maintain at least a 100 foot exclusion buffer around sensitive steephead slopes and
31 closed depression subsidence areas to prevent accelerated soil erosion of slopes and
32 wet soil rutting.
- 33 • As necessary, install temporary metal landing mats for HLZ/DZ landing training
34 activities conducted in wet areas during poor weather conditions. Mats can reduce
35 potentials for soil damage and provide stable platforms aircraft landings, materials
36 and personnel loading and unloading, and temporary storage.
- 37 • To the degree possible, utilize established walking trails or designated roads during
38 cross county dismounted maneuvers.
- 39 • Avoid cross county maneuvers through steephead locations. The steep to very steep
40 slopes of these geologic features are highly prone to accelerated rates of erosion if
41 disturbed. These areas are within LU-1 areas and would be identified by the L.I.T.

- 1 • Avoid the use of borrow pits for temporary campsites. For some pits, additional
2 surface disturbances could increase soil erosion rates or affect the stability of early-
3 stage pit reclamation.
- 4 • Avoid establishing temporary camps within or in proximity to steepheads and closed
5 depression areas. These sites may be sensitive to increases in stormwater runoff of
6 disturbances associated with camp activities. An exclusion zone of at least 100 feet is
7 recommended. These areas are within LU-1 areas and would be identified by the L.I.T.
- 8 • Avoid sensitive streambank areas that are overheightened and oversteepened and/or
9 areas exhibiting bank scour and mass failure features. These areas are within LU-1
10 areas and would be identified by the L.I.T.
- 11 • To the degree possible, avoid the repetitive use of the same egress and ingress
12 locations within the same year for AO.
- 13 • For sites where vegetation damage could result in loss of plant cover, reseed with
14 native species to encourage the reestablishment of vegetative cover.

15 **3.7 WATER RESOURCES**

16 Water resources include surface waters, ground water, wetlands, and floodplains. Each water
17 resource is referred to as a “receptor.”

18 **Surface Water**

19 Surface waters are any waters that lie above ground water, such as streams, springs, ponds,
20 lakes, rivers, bayous, and bays. Most of the streams in the GRASI region are classified as
21 seepage streams, or blackwater streams. Seepage streams are clear to lightly colored and
22 originate from shallow ground water that has percolated through deep, sandy, upland soils.
23 Blackwater streams are nutrient-poor streams that characteristically have tea-colored waters
24 laden with tannins, particulates, and dissolved organic matter and iron from swamps and
25 marshes that feed into the streams. Base flow in most streams originates from shallow ground
26 water discharge. Most rainfall quickly infiltrates the porous, sandy soils in the area with little, if
27 any, surface runoff.

28 **Ground Water**

29 Ground water includes the subsurface water resources and is commonly used for potable
30 water consumption, agricultural irrigation, and industrial applications. Aquifers may be
31 unconfined (open to the surface) or confined (separated from the surface by impermeable
32 layers of rock or sediments). Unconfined aquifers are generally more susceptible to
33 contamination from surface spills. Although overall water quality in northwest Florida is quite
34 good, non-point source pollution from agriculture, silviculture, and construction runoff is a
35 growing concern (FDEP, 2001; FDEP, 2002; FDEP, 2004).

36 **Wetlands**

37 Wetlands are areas of transition between terrestrial and aquatic systems where the water
38 table is usually at or near the surface or the land is covered by shallow water (Mitsch and
39 Gosselink, 1993). The term “wetlands” describes marshes, swamps, bogs, and similar areas.

1 Local hydrology and soil saturation largely affects soil formation and development, as well as
 2 the plant and animal communities found in wetland areas (USEPA, 2003).

3 **Floodplains**

4 Floodplains are lowland areas adjacent to surface water bodies (e.g., rivers, lakes, and
 5 wetlands), where flooding events periodically cover low-lying areas with water. Floodplain
 6 vegetation and soils act as water filters, intercepting surface water runoff before it reaches
 7 lakes, streams, or rivers, and store floodwaters during flood events. This filtration process aids
 8 in the removal of excess nutrients, pollutants, and sediments from the water.

9 **3.7.1 Impact Assessment Methodology**

10 The impact assessment for water resources evaluates the potential impacts of the Proposed
 11 Action effector impacts to water resources. Impacts to water resources are evaluated
 12 according to type, context, intensity, and duration (as described in Section 3.1), as well as the
 13 regulatory drivers identified below. Together, these attributes define the potential
 14 significance of the impacts.

15 **3.7.1.1 Regulatory Drivers**

16 Regulatory drivers affecting water resources include a number of federal laws, Air Force-
 17 specific regulations and instructions, state laws, and Eglin AFB instructions and policies.
 18 [Table 3-30](#) summarizes the most important regulatory drivers affecting water resources that
 19 could be affected by the Proposed Action.

20 **Table 3-30. Relevant Laws, Regulations, and Policies: Water Resources**

Law or Regulation	Citation	Summary
Federal		
Federal Water Pollution Control Act/Clean Water Act (FWPCA/CWA)	33 USC 1251 et seq.; 1997	In addition to regulating navigable water quality, the CWA establishes NPDES permit program for discharge into surface waters and stormwater control; USACE permit and state certification for wetlands disturbance; regulation of ocean discharge; sewage wastes control; and oil pollution prevention. Includes Dredged or Fill Permit Program; Section 404 regulates development in streams and wetlands by requiring a permit from the USACE for discharge of dredged or fill material into navigable waters. A Section 401 water quality certification is required from the state as well.
Safe Drinking Water Act (SDWA)	42 USC 300f et seq.; 1997	Requires the promulgation of drinking water standards, or maximum contaminant levels, which are often used as cleanup values in remediation; establishes the underground injection well program; and establishes a wellhead protection program.
Floodplain Management	Executive Order 11988; 24 May 1977	Directs federal agencies to restore and preserve floodplains by performing the following in floodplains not supporting development: evaluating effects of potential actions; allowing public review of plans; and considering in land and water resource use.

Table 3-30. Relevant Laws, Regulations, and Policies: Water Resources, Cont'd

Law or Regulation	Citation	Summary
Protection of Wetlands	Executive Order 11990; 24 May 77	Requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in their activities. Construction is limited in wetlands and requires public participation.
State		
Florida Aquatic Preserves Act	F.S. Chaps. 253, 258	Establishes state aquatic preserves.
Environmental Resource Permit Program and Sovereign Submerged Lands Program	F.S. Chap. 373; FAC Chap. 62-330	Establishes a comprehensive state regulatory program that regulates most land (uplands, wetlands, and other surface waters) alterations of the land.
Florida Air and Water Pollution Control Act	F.S. Chap. 403, Part I	Establishes the regulatory system for water resources, including wetlands in the state of Florida.
Surface Water Quality Standards	FAC Chap. 62-302	Classify Florida surface waters by use. Identify Outstanding Florida Waters
Florida Dredge and Fill Activities	FAC Chap. 62-312	Requires a state permit for dredging and filling conducted in, on, or over the surface waters of the state.
Aquifer Protection Program	FAC Chapter 62-520	Establishes the basis for prevention of ground water contamination; also provides ground water permitting and monitoring requirements.
Eglin Air Force Base		
Eglin Air Force Base Range Planning and Operations	Eglin Air Force Base Instruction 13-212, Chapter 7, Environmental Management	Outlines the general requirements in support of natural resources, cultural resources, and waste management. Compliance with the requirements in this chapter will help maintain quality environments for future testing and training missions and avoid mission delays.
Air Force		
Air Force Policy Directive 32-70; 20 July 1994; Environmental Quality		Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Clean Water Act, Safe Drinking Water Act, and Water Quality Act of 1987.
Air Force Instruction 32-7041; 10 December 2003 (Eglin Supplement, 16 June 2010); Water Quality Compliance		Instructs the Air Force on maintaining compliance with the CWA; other federal, state, and local environmental regulations; and related DoD and Air Force water quality directives.
Air Force Instruction 32-7064; 22 July 1994; Integrated Natural Resources Management		Sets forth requirements for addressing wetlands, floodplains, and coastal and marine resources in an integrated natural resources management plan for each installation.

DoD = Department of Defense; FAC = Florida Administrative Code; F.S. = Florida Statutes; NPDES = National Pollutant Discharge Elimination System; USACE = U.S. Army Corps of Engineers; USC = United States Code

1 **3.7.1.2 Assessment Method**

2 Users of the Eglin Range observe procedures in EAFBI 13-212, which incorporates appropriate
3 conservation measures but also ensures environmental stewardship in relation to training
4 missions. As part of the Proposed Action, the measures in EAFBI 13-212 would be observed
5 during GLI training activities. For purposes of this EIS, analysis of impacts to water resources
6 assumed that avoidance measures in EAFBI 13-212 would be observed and properly

1 implemented as part of the Proposed Action. If necessary, additional potential mitigations or
 2 impact minimization measures were identified as part of the analysis.

3 The impacts analysis assessed the potential for the Proposed Action to interact with known
 4 water resources at BRSF and THSF. The impact from these interactions may be direct, indirect,
 5 or if combined with other actions, cumulative. To inventory the water resources at BRSF and
 6 THSF, the Air Force accessed information from the state and federal agencies with regulatory
 7 oversight and/or resource management responsibility for these resources. Each of the
 8 previously identified water resources categories may be impacted differently by one or more
 9 of the proposed training activities. There are also specific regulations that must be considered
 10 for analyzing impacts to water resources.

11 The Air Force has conducted a Coastal Consistency Determination in accordance with the
 12 Coastal Zone Management Act (see Appendix C, *Consultation Documentation*), with a finding
 13 that the Proposed Action is consistent with the Act and its provisions. The State of Florida will
 14 review the Coastal Consistency Determination as part of the NEPA process; any
 15 correspondence received in this regard will be included in the Final EIS.

16 [Table 3-31](#) defines how the impact attributes of context, intensity, and duration are applied to
 17 water resource analysis.

18 **Table 3-31. Definitions of Impact Attributes for Water Resource Categories**

Attribute	Surface Water	Ground Water	Wetlands	Floodplains
Contexts Analyzed				
Regional/population	County level, state park level, or management unit level effects; impacts to populations			
Localized	Less than management area effects; impacts to individuals			
Intensity (can be either adverse or beneficial)				
High Extensive mitigations required to minimize or avoid adverse impacts; scope of mitigations based on context and duration of the impact.	Substantive change in water quality that either substantially enhances existing water quality or precludes the use of a surface water body as it is intended or designated.	Substantive change in water quality that either substantially enhances existing water quality or precludes the use of an aquifer's designated use.	Substantive changes in or loss of wetland habitat or functionality.	Substantive changes in floodplain characteristics that either substantially enhance existing floodplain functions and quality or preclude the use of a fully functional floodplain.
Medium Mitigations may be required in certain instances based on the context and duration of the impact.	Moderate changes in water quality that either enhance existing water quality or that result in recoverable interruption of a surface water body's designated use.	Moderate changes in water quality that either enhance existing water quality or that result in recoverable interruption of an aquifer's designated use.	Moderate changes in wetland habitat or functionality that either enhance existing water quality or that result in recoverable interruption of a wetland's baseline functions and quality.	Moderate changes in floodplain characteristics that either enhance existing floodplain functions or that result in a fully functional floodplain.
Low Adverse impacts recoverable through natural processes with no mitigations required.	Minor changes in water quality that neither enhance nor disrupt a water body's intended/designated use.	Minor changes in water quality that neither enhance nor disrupt an aquifer's intended/designated use.	Minor changes in wetland quality and functions that neither enhance nor disrupt a wetland's baseline functions and quality.	Minor changes in floodplain characteristics that neither enhance nor disrupt a floodplain's baseline functions.

Table 3-31. Definitions of Impact Attributes for Water Resource Categories, Cont'd

Attribute	Surface Water	Ground Water	Wetlands	Floodplains
Neutral	No perceptible water quality changes.	No perceptible water quality changes.	No perceptible changes in wetland quality or function.	No perceptible changes in floodplain characteristics.
Duration				
Long term	Effect would likely endure for the life of the action.			
Medium term	Effect would likely last for a few months to a year.			
Short term	Effect would likely last for a few days to weeks.			

1 3.7.1.3 Impact Levels

2 The level of impact associated with water resources and the impact's potential significance is
 3 determined by considering how Proposed Action effectors could interact with water
 4 resources in terms of context, intensity, and duration as described in [Table 3-31](#). [Table 3-32](#)
 5 explains the impact level categories for water resources analyzed in this EIS and identified in
 6 Chapters [4](#), [5](#), and [6](#).

Table 3-32. Impact Level Categories for Water Resources

Level of Impact	Surface Water	Ground Water	Wetlands	Floodplains
Adverse	Adverse impacts may result in degradation to surface water, the level of impact directly related to the impact attributes described in Table 3-31 . Adverse impacts may be perceived as significant under high-intensity scenarios over a long-term duration where there is substantive contamination through sedimentation and/or chemical interactions. Insignificant impacts may occur under medium- to low-intensity scenarios of a short-term or temporary duration and lesser amounts of sedimentation and/or chemical contamination.	Adverse impacts may result in degradation to ground water availability and/or quality, the level of impact directly related to the impact attributes in Table 3-31 . Impacts may be perceived as significant under high-intensity scenarios with long-term use/drawdown of supplies or contamination. Insignificant impacts may occur under medium- to low-intensity scenarios with a short-term duration of increased ground water use/drawdown or smaller amounts of contamination.	Adverse impacts may result in direct or indirect degradation to jurisdictional wetland habitat and/or functions, the level of impact directly related to the impact attributes in Table 3-31 . Impacts may be perceived as significant under high-intensity scenarios of any duration with contamination of entire wetland areas or loss of entire wetlands. Insignificant impacts may occur under medium- to low-intensity scenarios of any duration that result in small amounts of contamination of wetland area segments or partial loss of wetland area/vegetation.	Adverse impacts may result in loss of floodplain area and/or function, the level of impact directly related to the impact attributes in Table 3-31 . Impacts may be perceived as significant under high-intensity scenarios of any duration resulting in loss of large areas of floodplain area and/or function. Insignificant impacts may occur with only localized, segmental disturbance of floodplain area that does not necessarily result in overall loss of floodplain functionality.
	High-intensity impacts are typically only recoverable through long-term natural processes and/or substantive mitigations, while lesser impacts are recoverable over the short to medium term through natural processes or with minor mitigation.			
Neutral/ no effect	Actions that improve or protect water resources or result in no noticeable change.			

3.7.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to water resources. Use of fuels for generators would require implementation of Air Force spill control and response procedures to minimize surface/ground water interactions from any spills. The proposed use of emitter sites would not involve any land disturbance activities within or near water resources. As a result, given the negligible potential for interactions/impacts to water resources and the negligible potential to impact public health or the human and natural environment, and the fact that this activity would not result in potential violations of federal, State, or local regulations, this Proposed Action component is not carried forward for detailed analysis in Chapter 4.

3.7.3 General Training Activity Impact Assessment

Land Disturbance

Land disturbance due to land improvement activities is a potential impact for all water resources in each tactical area. It is unlikely that land improvement activities would have any direct effect on surface water resources since these activities would not be allowed near surface waters, wetlands, or floodplains under LU-1 protection levels. However, land improvement activities could potentially have indirect effects on these resources through soil erosion and migration into streams, wetlands, or floodplains. Suspended sediment in surface waters can adversely affect water quality by reducing clarity. Likewise sediments deposited in streams can alter flow patterns and disrupt stream flow.

Use of heavy equipment for land-clearing activities could also have potential indirect effects on water resources; however, there would be no land clearing activities associated with the Proposed Action. The Air Force would utilize areas previously cleared by the FFS as part of normal silvicultural activities. Heavy equipment may be utilized as a component of road compacting and general improvements for FWALS development. The heavy equipment could be a source of contamination to water resources if there are any leaks or spills of fuels, hydraulic fluids, or other petroleum products used for the operation or maintenance of this equipment and those fluids migrated into surface water, groundwater, wetlands, or floodplains.

Furthermore, standard stormwater pollution prevention measures such as silt fences and sediment detention basins and chemical spill prevention measures would prevent migration of sediment and other potential contaminants into water resources. Therefore land improvement activities would not be expected to have any significant adverse effects on water resources at either forest. No filling or disturbance of wetlands or floodplains is proposed, and no USACE Section 404 permitting requirements have been identified.

Land disturbance due to NRC is a potential impact for surface waters and wetlands in all tactical areas. Potential effects from removal of water, animals, and plants from surface water and wetlands would be direct, but on a minor scale. Disturbance would be limited to localized disturbance of surface water, sediments, and shorelines of surface waters and

1 wetlands, which can temporarily suspend sediments and diminish water clarity. Disturbance
2 from consumption would be temporary and limited to localized areas; these effects would
3 quickly diminish once foraging troops moved out of the area and would be negligible.

4 **Ground Movement**

5 Ground movement activities that could affect water resources include wheeled vehicle use
6 and CCDM. Ground movement would not be expected to impact floodplains because
7 wheeled vehicles would remain on established roadways, and foot traffic would not impact
8 the functionality of a floodplain.

9 Wheeled vehicle use for ground movement is a potential impact for water resources in all
10 tactical areas. Wheeled vehicle use would not have any direct effect on surface water
11 resources since vehicles would not be allowed direct access to any surface waters or wetlands
12 under the LU-1 protection level. Vehicle use would be restricted to existing roads and trails
13 and approved, existing crossing locations in streams and wetlands. If off-road vehicle use is
14 required for any reason the respective FFS Management Office would need to be consulted
15 prior to occurrence, and no vehicles would be allowed within 100 feet of a surface water body
16 or wetland as specified by EABFI 13-212.

17 Wheeled vehicle activities could potentially have indirect effects on water resources. Routine
18 use of the existing dirt road network that extends throughout the tactical areas is a regular
19 contributor to roadway erosion, and a recognized problem affecting some streams and
20 wetlands (Florida Division of Forestry [FDOF], 2000). Leaks of fuel and other vehicle fluids
21 would also be a potential indirect source of contamination to water resources as described
22 under land improvement effects. Some indirect effects to water resources from roadway
23 erosion are likely and assumed to occur. While the potential for these occurrences are
24 inherent to vehicle use (whether for the military, the FFS, or civilians) and unavoidable,
25 implementation of standard vehicle maintenance and spill prevention SOPs would minimize
26 the potential for occurrence to a negligible level.

27 Dismounted troop movement is a potential impact for surface water and wetland resources in
28 all tactical areas. Potential effects would be direct, but on a minor scale. Large groups or
29 heavy repeated use of a particular area can cause stream banks or shorelines to erode,
30 indirectly affecting water clarity, stream course, and rate of flow. Rotation of any stream or
31 water body ingress/egress areas would serve to minimize the potential for any medium to
32 long-term impacts associated with shoreline erosion, and units would be advised to avoid any
33 noticeably eroded shorelines. Over the short term sediments in fast-flowing streams typical of
34 those found on the forests would settle rapidly and water clarity would return, causing the
35 streams to return to their former state once units had moved on.

36 **Expendables**

37 Pyrotechnics (including smoke grenades) and fueling operations are prohibited within LU-1
38 protection areas associated with surface waters and wetlands. Use of blanks and paintballs
39 would not be expected to result in adverse impacts to water resources because any brass
40 casings or other debris would be picked up as part of general operating constraints identified

1 in Section [2.5](#). While fueling activities would only be allowed in LU-2 protection areas there is
2 a risk of fuel spills when handling large quantities of fuel and any fuel spills may migrate
3 quickly into adjacent water resource receptors and contaminate surface water, groundwater,
4 wetland sediments, and floodplain soils. Where fueling would occur, activities are covered
5 under several SOPs and AFIs as described in Section [3.12](#), *Solid and Hazardous*
6 *Materials/Waste*, and implementation of these requirements would serve to minimize the
7 potential for spills to occur or impact surface waters. Provided SOPs and EAFBI instructions
8 are implemented the Air Force anticipates no adverse impacts from fueling operations.

9 ***Amphibious Operations***

10 AO may potentially impact surface waters and associated shorelines throughout the forest
11 areas, as personnel may use any of the surface waters. Potential effects of AO would include
12 disturbance of streambeds and shorelines from the loading and unloading of watercraft and
13 movement of watercraft on the surface waters, as well as ingress/egress of troops over the
14 land/water interface as discussed in detail in the *Riverine/Estuarine Programmatic*
15 *Environmental Assessment (U.S. Air Force, 2004)*. AO would adhere to the General Operational
16 Constraints and mitigations identified in Section [2.5](#) associated with EAFBI 13-212 Section
17 7.2.9. Impacts to water resources would be minimized to less than adverse by limiting activity
18 to designated landing zones and by rotating landing zones when these areas show signs of
19 erosion. There is potential for release of fuel from watercraft to surface waters, however this
20 potential is inherent in watercraft use (whether military or civilian). Such potential for adverse
21 impacts are minimized to a negligible level by implementation of SOPs for watercraft
22 maintenance and spill prevention procedures as identified in Section [3.12](#), *Solid and*
23 *Hazardous Materials/Waste*.

24 **3.7.3.1 General Training Activity Impact Assessment Summary**

25 Based on the scope of action described in Chapter [2](#), many training activities would have at
26 least some interaction with one or more water resource categories. [Table 3-33](#) identifies
27 potential interactions between Proposed Action effectors and water resource receptors.
28 Items shaded yellow have been carried forward for site-specific analyses in Chapters [5](#) (BRSF)
29 and [6](#) (THSF). Activities shaded in green have little potential to impact the human and natural
30 environment or do not result in potential violations of federal, state, or local regulations.
31 Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

1

Table 3-33. Receptor and Effector Interactions for Water Resources

Proposed Action Effector	Water Resource Area Potentially Affected (Receptor)			
	Surface Water	Ground Water	Wetlands	Floodplains
Land Disturbance				
Land development	No adverse impacts have been identified. Water resources would be avoided; no land development activities would occur within/adjacent to water resources. Any indirect impacts (e.g., erosion) would be short term in nature, recoverable through natural processes and mitigated through permitting/BMP requirements (e.g., use of silt fencing). This issue area has not been carried forward for site-specific analysis.			
Point impact	No adverse impacts have been identified since there would be little interaction with water resources. There would be no digging within water resources. This issue area has not been carried forward for site-specific analysis.			
Incidental surface disturbance				
Consumption	No adverse impacts have been identified since there would be little interaction with water resources. This issue area has not been carried forward for site-specific analysis.			
Ground Movement				
Wheeled vehicles	The potential for adverse impacts has been identified associated with water crossings (at approved locations) interacting with streams and stream banks, potentially resulting in erosion/sedimentation. This issue area has not been carried forward for site-specific analysis.	No adverse impacts have been identified since there would be little interaction with ground water resources. This issue area has not been carried forward for site-specific analysis.	The potential for adverse impacts has been identified associated with wetland crossings (at approved locations) potentially resulting in erosion/sedimentation and destruction of wetland vegetation. This issue area has not been carried forward for site-specific analysis.	No adverse impacts to floodplains would be expected. Wheeled vehicles would be used on approved roadways only; stream and wetland crossings would occur at approved locations. This issue area has not been carried forward for site-specific analysis.
Dismounted maneuvers	The potential for adverse impacts has been identified associated with localized disturbance to streams and stream banks (e.g., erosion/sedimentation) from personnel. This issue area has been carried forward for site-specific analysis.	No adverse impacts have been identified since there would be little interaction with ground water resources. This issue area has not been carried forward for site-specific analysis.	The potential for adverse impacts has been identified associated with localized disturbance to wetland vegetation (e.g., trampling) from personnel. This issue area has been carried forward for site-specific analysis.	No adverse impacts have been identified since there would be little interaction with floodplain resources. This issue area has not been carried forward for site-specific analysis.
Use of Expendables				
Blanks/GBS	No adverse impacts identified. Expendables may affect water resources due to release of associated chemical constituents (lead, perchlorate, and dyes). However, as identified in the Interstitial Range Environmental Assessment, use of munitions and pyrotechnics would not result in adverse impacts, given the wide area of dispersal, mechanisms for degradation, and the low amount of constituents released (U.S. Air Force, 2009). Additionally, "green" munitions would be used to the extent practicable, thus resulting in lower constituent releases. Finally, the management requirement to be at least 100 feet away from surface water for munitions and pyrotechnics use minimizes the potential for impacts. This issue area has not been carried forward for site-specific analysis.			
Smoke grenades				
Other/equipment				

Table 3-33. Receptor and Effector Interactions for Water Resources, Cont'd

Proposed Action Effector	Water Resource Area Potentially Affected (Receptor)			
	Surface Water	Ground Water	Wetlands	Floodplains
Aircraft Operations	No adverse impacts have been identified since there would be little interaction with water resources. This issue area has not been carried forward for site-specific analysis.			
Amphibious Operations	The potential for adverse impacts has been identified associated with boat landings and nearshore activities potentially affecting shoreline erosion in streams and rivers. This issue area has been carried forward for site-specific analysis.	No adverse impacts have been identified since there would be little interaction with ground water resources. This issue area has not been carried forward for site-specific analysis.	The potential for adverse impacts has been identified associated with activities in estuarine areas and water-land transition actions affecting wetlands. This issue area has been carried forward for site-specific analysis.	No adverse impacts have been identified since there would be little interaction with floodplain resources. This issue area has not been carried forward for site-specific analysis.
Utilities	No adverse impacts identified. Utilities usage at hardened camp sites would only interact with ground water, in the sense that personnel would utilize local water supplies for drinking/wastewater. However, use of this resource would be intermittent and would not result in any significant or noticeable draw on local/regional ground water supply. This issue area has not been carried forward for site-specific analysis.			

BMP = best management practice; GBS = ground burst simulator

1 **3.7.4 Proposed Resource-Specific Mitigations**

2 General Operational Constraints to minimize impacts to water resources are identified in
 3 Section 2.5, and have been described in the analyses. These would be inherent to the
 4 Proposed Action. Additional action-specific operational constraints or mitigations have been
 5 identified that would further minimize impact potential or the severity of identified impacts:

- 6 • To minimize localized damage potential from foraging and dismounted troop
 7 movements, the size of troop units will be kept to small manageable numbers. Troop
 8 use would be rotated within and among TAs to prevent concentration of activities in
 9 particular locations. Implementation of this mitigation would allow water resources to
 10 recover from extended use after intensive training activities.
- 11 • Roads, trails, and stream/wetland crossings would be inspected before and after each
 12 training mission to identify maintenance issues that could cause problems if not
 13 repaired. Training activities would be shifted or redirected if conditions of roads and
 14 stream and wetland crossings require repair or other measures to prevent erosion
 15 from impacting surface waters and wetlands. The FFS will be notified of any identified
 16 issues. Wheeled vehicle training would only occur on crossings rated as good or fair
 17 condition; no wheeled vehicle training would occur at crossings rated Poor until these
 18 crossing are approved by the FFS.
- 19 • The potential for spills during land improvement activities, vehicle use, and FARP/HGO
 20 can be mitigated through training and use of spill prevention protocols, trained
 21 response equipment and personnel, use of and secondary containment during
 22 refueling activities (FARP/HGO).
- 23 • Amphibious landings would utilize designated ingress/egress points identified
 24 through coordination between the GLI Liaison and the FFS. To the extent possible AO

1 should use established, hardened boat ramps for ingress/egress of amphibious craft. If
2 ingress/egress must utilize natural habitat in wetlands, care should be taken to avoid
3 destruction of wetland vegetation or other activities that might cause shoreline
4 erosion. Ingress/egress points for both personnel and watercraft should be rotated to
5 the extent possible to allow sites time to recover from AO.

6 The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has
7 recommended the following conservation measure: avoidance of "Good" and "Poor" rated
8 vehicle water crossings for training use in order to protect the better crossing sites and
9 minimize further degradation of the sites in poor condition.

10 **3.8 BIOLOGICAL RESOURCES**

11 Within the context of this EIS, the term "biological resources" refers to the vegetation, wildlife,
12 protected species, sensitive habitats, and invasive plant and animal species associated with
13 the land areas proposed for use. Each biological resource component is referred to as a
14 "receptor."

15 **3.8.1 Impact Assessment Methodology**

16 The impact assessment for biological resources evaluates the potential impacts of the
17 Proposed Action to biological resources. Impacts to biological resources are evaluated
18 according to type, context, intensity, and duration (as described in Section 3.1), as well as the
19 regulatory drivers identified below. Together, these attributes define the potential
20 significance of the impacts.

21 **3.8.1.1 Regulatory Drivers**

22 Laws and regulations applicable to the Proposed Action for biological resources are
23 summarized below.

- 24 • ESA of 1973 (16 USC 1531 to 1544; 1997–Supp): Provides for the conservation of
25 endangered and threatened species and the ecosystems on which they depend and,
26 per Section 7 of the act, requires federal agencies to consult with the USFWS and/or
27 National Marine Fisheries Service if impacts to federally listed species are possible.
- 28 • AFD 32-70: Directs the implementation of the ESA.
- 29 • AFI 32-7064: Details how to manage natural resources in such a way as to comply with
30 federal, state, and local laws and regulations and calls for the protection and
31 conservation of state-listed species when not in direct conflict with the military
32 mission.
- 33 • EAFBI 13-212, Chapter 7: Identifies requirements for protection of natural and cultural
34 resources and waste management.
- 35 • BEPA (16 USC 668–668d): Prohibits the taking or possession of and commerce in bald
36 eagles.
- 37 • Migratory Bird Treaty Act (16 USC 703-712; 1997-Supp) and EO 13186, Responsibilities
38 of Federal Agencies to Protect Migratory Birds: Protects migratory birds and their

1 habitats and establishes a permitting process for legal taking. The Armed Forces are
2 exempted from the incidental taking of migratory birds during military readiness
3 activities (such as those described in this EIS), except in cases where an activity would
4 likely cause a significant adverse effect to the population of a migratory bird species.

- 5 • Marine Mammal Protection Act (MMPA) of 1972: Establishes a comprehensive federal
6 plan to conserve marine mammals.
- 7 • EO 13112, *Invasive Species*: States that no federal agency shall authorize, fund, or carry
8 out actions that it believes are likely to cause or promote the introduction or spread of
9 invasive nonnative species in the U.S. or elsewhere.

10 **3.8.1.2 Assessment Method**

11 As stated in Chapter 2, the Air Force currently abides by conservation measures detailed in
12 the *Final Formal ESA Section 7 Consultation for Interstitial Area Activities at Eglin Air Force Base,*
13 *Florida* (USFWS, 2012), which addresses all protected interstitial species on Eglin. Additionally,
14 the USFWS has issued a separate biological opinion for the red-cockaded woodpecker, which
15 was received August 14, 2013. The conservation measures are designed to avoid or minimize
16 impacts to protected species from training activities. Eglin AFB range users also observe
17 procedures in EAFBI 13-212, which incorporates consultation conservation measures but also
18 ensures environmental stewardship in general. Measures specified in EAFBI 13-212 and Eglin
19 Interstitial ESA consultations, where applicable, are included in GLI training components as
20 part of the Proposed Action. For purposes of this EIS, analysis of impacts to biological
21 resources assumed that avoidance measures in EAFBI 13-212 and conservation measures
22 identified in the previously mentioned consultations would be implemented as part of the
23 Proposed Action. If necessary, additional potential mitigations or impact minimization
24 measures were identified as part of the analysis.

25 The impacts analysis assessed the potential for the Proposed Action to interact with known
26 natural resource communities or species. The impact from these interactions may be direct,
27 indirect, or if combined with other actions, cumulative. To provide a general inventory of the
28 natural resources at BRSF and THSF, the Air Force accessed information from the state and
29 federal agencies with regulatory oversight for these resources and, where available, obtained
30 data and publications on species and community types and locations. Biological resources
31 were categorized as vegetation, wildlife, protected species, sensitive habitats, and invasive
32 species. Each of these categories may be impacted differently by one or more of the
33 proposed training activities. For example, protected species and habitats have a greater
34 sensitivity to impacts than nonprotected vegetation and wildlife. Likewise, there are specific
35 regulations that must be considered for analyzing impacts to protected species and habitats.

36 [Table 3-34](#) defines how the impact attributes of context, intensity, and duration are applied to
37 biological resource analyses.

1 **Table 3-34. Definitions of Impact Attributes for Biological Resource Categories**

Attribute	Vegetation	Wildlife	Protected Species	Sensitive Habitats	Invasive Species
Contexts Analyzed					
Regional/population	County level, state park level, or management unit level effects; impacts to populations.				
Localized	Less than management area effects; impacts to individuals.				
Intensity (can be either adverse or beneficial)					
High Mitigations required to minimize or avoid adverse impacts, with scope of the mitigations based on context and duration of the exposure or impact. Unavoidable adverse effects may not be recoverable.	Substantive impact that alters the landscape and results in respective change in health of ecosystem. Examples include large-scale improvement or destruction of entire vegetative communities within the associated context only recoverable over the long term.	Substantive impact that results in respective change in health of receptor. May involve substantial improvement or decline in health of species or associated habitat, such as species recovery management activities or species mortality.	Substantive impact that alters the sensitive habitat's operational health. May include large-scale increase or decrease in size of habitat.	Substantive change in invasive species environment (e.g., removal of species entirely or introduction of new species).	
Medium Mitigations may be required to avoid adverse impacts depending on context and duration of the exposure/impact. Unavoidable adverse impacts likely recoverable with BMPs and mitigations.	Moderate alteration of the landscape with no change in overall ecosystem functionality. May involve improvement or disturbance of pockets of vegetative communities within associated context, with adverse impacts recoverable over medium term.	Moderate impact to species that result in relative change in health of receptor. May involve moderate improvement to species health/habitat, distribution and/or changes, or injury.	Moderate impact that alters the sensitive habitat's operational health. May include moderate improvement in habitat quality or removal of portions of habitat.	Moderate change in invasive species environment. May include species control or introduction and expansion of existing species into new areas.	
Low No mitigations required. Unavoidable adverse impacts recoverable through natural processes.	Slight alterations to landscape (e.g., trampling or planting of individual plants) that do not affect ecosystem health/functionality. Adverse impacts are recoverable over the short term.	Minor change to overall health of receptor. May involve minor improvement to habitat, harassment or startle responses.	Negligible change to overall operational health of habitat. May involve slight improvement to habitat quality, or slight degradation with no removal.	Slight change in invasive species environment. May include expansion of existing species into existing areas of invasive species.	
Neutral	No perceptible change ecosystem health/functionality.	No observable change in wildlife distribution or behavior.	No discernible alteration to sensitive habitat.	No apparent change in invasive species environment.	
Duration					
Long term	Effect would likely endure for the life of the action.				
Medium term	Effect would likely last for a few months to a year.				
Short term	Effect would likely last for a few days to weeks.				

BMP = best management practice

2 **3.8.1.3 Impact Levels**

3 The level of impact associated with biological resources and the impact's potential
4 significance is determined by considering how Proposed Action effectors could interact with
5 biological resources in terms of context, intensity, and duration as described in [Table 3-34](#).
6 [Table 3-35](#) explains the impact level categories for biological resources analyzed in this EIS
7 and identified in Chapters [4](#), [5](#), and [6](#).

1

Table 3-35. Impact Level Categories for Biological Resources

Level of Impact	Vegetation	Wildlife	Protected Species	Sensitive Habitats	Invasive Species
Adverse	Adverse impacts may result in alteration to the vegetative landscape or affect ecosystem health/functionality, the level of impact directly related to the impact attributes described in Table 3-34 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration and may not be recoverable. Insignificant impacts may occur under medium- to high-intensity scenarios of any duration where impacts are likely recoverable with best management practices and mitigations.	Adverse impacts may result in the mortality, injury, or decline in health of species, the level of impact directly related to the impact attributes described in Table 3-34 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration that result in species mortality or injury. Insignificant impacts may occur under medium- to low-intensity scenarios of any duration with incidental harassment, injury, or potential for mortality that can be mitigated and for which permits can be obtained.		Adverse impacts may result in habitat alteration, reduced habitat size, and decline in habitat quality, the level of impact directly related to the impact attributes described in Table 3-34 . Adverse impacts may be perceived as significant under medium- or high-intensity scenarios of any duration resulting in substantive habitat degradation and removal. Insignificant impacts may occur under low- to medium-intensity scenarios of any duration where habitat alteration is recoverable.	Adverse impacts may result in the spread of invasive species, the level of impact directly related to the impact attributes described in Table 3-34 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration resulting in large areas of new invasive species that cannot be controlled without long-term intervention. Insignificant impacts may occur under low- to medium-intensity scenarios of any duration that create conditions that encourage spread of invasive species but manageable with conditions or mitigations.
Neutral/no effect	Activities do not affect the health of a population or habitat on a long-term basis (regardless of intensity).	Activities have no effect on the health or stability of a population or group of individuals on a long-term basis (regardless of intensity).		Activities do not have any effect on the health of a habitat or plant community on a short- to long-term basis (regardless of intensity).	Activities result in eradication of an invasive species or do not result in the spread of invasive species.

2 **3.8.2 General Emitter Activity Impact Assessment**

3 Based on the scope of action described in Chapter 2, emitter site use would not be expected
 4 to result in impacts to biological resources, because sensitive habitats and protected species
 5 would be avoided. The small footprint of the emitter equipment and the use of improved
 6 and semi-improved areas would not damage native vegetation or displace wildlife. Exposure
 7 to potentially harmful levels of EMR is highly unlikely, given that wildlife are not likely to
 8 approach areas where humans are active and wildlife are not likely to continuously remain
 9 within the hazard distance. Emitter site activities have little potential to impact the natural

1 environment or do not result in potential violations of federal, state, or local regulations.
2 Therefore, these activities are not carried forward for detailed analysis in Chapter 4.

3 **3.8.3 General Training Activity Impact Assessment**

4 Based on the scope of action described in Chapter 2, all training activities would have at least
5 some interaction with one or more biological resource categories.

6 Per general operation constraints identified in Section 2.5, sensitive species and habitat
7 would be protected, and aspects of EAFBI 13-212 and Eglin AFB sensitive species
8 consultations would be implemented as part of the Proposed Action. Hence, the following
9 activities would not be expected to result in adverse impacts and are not discussed further in
10 this chapter:

- 11 • **Land disturbance (point impact, ISD):** These activities are not likely to result in
12 potential impacts associated with displacement or mortality of nonsensitive biological
13 resources. These activities may result in short-term impacts that are recoverable
14 without mitigation (e.g., placing a stake in the ground). As a result, the Air Force
15 anticipates no adverse effect to biological resources from these activities.
- 16 • **UoEX (other/equipment):** Intermittent use of generators may result in minor, localized
17 temporary noise disturbance to wildlife but would not otherwise interact with flora or
18 fauna. The Air Force expects no effect to wildlife from the temporary noise associated
19 with generator use.
- 20 • **Utilities:** Utilities usage would not interact with flora or fauna and, therefore, would
21 not impact biological resources.

22 **Vegetation**

23 Aircraft operations would not be expected to have any impact on vegetation.

24 **Land Disturbance**

25 Land disturbance associated with minor improvements to HLZs and FWALS, as well as other
26 aircraft operations, would result in minor surface disturbance, causing either trampling or
27 vegetation removal. Such impacts would be short term and recoverable, as use of HLZs and
28 FWALS rotates. Mitigations associated with land development practices (e.g., soil erosion
29 prevention) may be required. Consumption of vegetation would result in direct physical
30 impacts to vegetation, but these impacts would be very localized and intermittent and would
31 not be expected to adversely impact the overall vegetative environment of the forest. These
32 potential impacts apply to all tactical areas where land development may occur.

33 **Ground Movement**

34 All activities involving wheeled vehicles would occur on designated roads and established
35 crossing points utilized by the FFS. While water crossings could interact with aquatic
36 vegetation at designated crossings, the Air Force would coordinate with the FFS to ensure
37 that degraded crossings either are not utilized or are reported. CCDM may result in trampling
38 of vegetation as personnel walk through the forest. However, these impacts would be
39 localized and recoverable over the short term. Personnel would rotate utilization, thus further
40 minimizing potential adverse impacts.

1 **Expendable Use**

2 Indirect impacts from wildfires started by expendables would have both adverse and
3 potentially beneficial impacts to vegetation. Generally, controlled fire can be beneficial to
4 ecological communities and species by maintaining the grassy understory and preventing
5 mid-story encroachment. However, wildfires can damage the habitats of species that rely on
6 these communities. The FFS utilizes a fire management program that includes wildfire
7 prevention, detection and suppression, and prescribed burning.

8 **Amphibious Operations**

9 There would be potential adverse impacts to shoreline and aquatic vegetation due to
10 trampling/rutting associated with landing of watercraft along shorelines. Impacts would be
11 short term and recoverable through mitigations such as rotation of established boat landing
12 sites.

13 **Wildlife**

14 Wildlife could be directly impacted by land disturbance, temporary disturbance and
15 displacement from ground movement and vehicle and boat collisions, and noise and wildfire
16 from UoEX.

17 **Land Disturbance**

18 Some incidental impacts may occur during fixed-wing aircraft landing site improvements due
19 to trampling or crushing from equipment. However, activities would occur within existing
20 roadbeds, and most species would move from the area during equipment use; these areas are
21 currently disturbed as part of regular road maintenance by the FFS. Impacts would be
22 incidental, and given the scope of activities (only occurring at a few locations and within small
23 road segments) the potential for impact is minimal. During training, some wildlife such as
24 birds, reptiles, and small mammals would be consumed by troops. However, the amount
25 consumed would not be enough to decrease a population or have regional impacts and
26 would not be considered significant given the extent of public use and hunting in the state
27 forests. Consumption levels would be minimal, and be less than wildlife takes from
28 recreational hunters.

29 **Ground Movement**

30 Vehicles would operate on established roads under 35 miles per hour (mph), which should
31 reduce the chance for collision. The number of vehicles that would be used, and the proposed
32 frequency, results in only a small increase in the baseline traffic on local roads; as a result, the
33 potential for a roadway collision would be considered similar to the baseline condition.
34 Ground troop movement is unlikely to impact wildlife in any appreciable manner, as wildlife
35 generally avoid persons walking through the forest, similar to hikers that currently use the
36 forest. Troop sizes would be relatively small (Section [2.4](#)) and the chances for trampling of
37 wildlife would be negligible.

38 **Expendable Use**

39 Expendables would generate noise and smoke that would temporarily disturb or displace
40 wildlife, and there would be a potential for these items to start wildfires.

41 Wildlife could also be disturbed by noise produced during small arms fire and use of ground-
42 burst simulators. Individuals could be startled by the firing of 5.56-mm and 7.62-mm inert
43 rounds, with reactions similar to those described for overflight noise. The 7.62-mm rounds
44 would be the more impactful of the two sizes, producing noise levels of 102 dB at 1,000 feet
45 from the firing point. There is the potential for nesting birds to be startled enough to displace

1 an egg or nestling from their nest or even abandon their nest. However, most animals
2 (including birds) in the immediate vicinity of ground training operations would be aware of
3 human presence and may move some distance away before munitions were fired, thus
4 exposing fewer individuals to noise effects. Ground-burst simulators would produce
5 substantially greater noise levels, potentially resulting in physiological harm (hearing effects)
6 or behavioral effects to species in the immediate vicinity. Noise levels associated with
7 munitions use are provided in Section [3.3](#).

8 Expendables would also produce a potential increase in wildfire occurrences. With the
9 exception of some protected species on Eglin AFB that are monitored by Eglin Natural
10 Resources, the impacts to wildlife from mission wildfires at Eglin have not been quantified.
11 As fire is routinely employed by natural resource managers at both Eglin and by the FFS for
12 ecological management, it is both beneficial and necessary for some habitats but can be
13 detrimental under the wrong conditions (FDACS, 2007; U.S. Air Force, 2013a). To minimize the
14 potential for wildfires, training groups would follow general operation constraints identified
15 in Section [2.5](#); for example, during days with low fire danger, there are no restrictions on
16 missions, but on days with extreme fire danger, no pyrotechnics are allowed without prior
17 approval from the Eglin WFPM. The Air Force would work with the FFS to develop a similar
18 approval process.

19 Expendables can also produce chemical residue that could potentially impact wildlife
20 through direct contact, ingestion, inhalation, or bioconcentration. The most likely
21 opportunity for such exposure would be immediately after the smoke has been dispelled.
22 However, wildlife would most likely leave the area during training exercises, thereby reducing
23 the likelihood of direct exposure. The potential for ingestion or inhalation of particles in
24 sufficient amounts to cause harm is also low, due to wind-driven distribution of smoke
25 particles.

26 ***Aircraft Operations***

27 Aircraft would generate noise that would temporarily disturb or displace wildlife. The
28 potential effects of aircraft overflight on animals have been investigated to varying degrees,
29 depending on the species. A substantial literature synthesis report was compiled and
30 published in 1998 as a cooperative effort between the USFWS and the Air Force Engineering
31 and Services Center at Tyndall AFB, Florida (Manci et al., 1988). A review of available literature
32 of the effects of aircraft noise on domestic animals (among other types of animals) is also
33 provided by NoiseQuest (2013). The following information is derived from these sources,
34 except where otherwise noted.

35 Animal response to aircraft noise is influenced by many variables such as aircraft size, speed,
36 proximity, and engine noise level, among others. In addition, response may differ according
37 to aircraft type (fixed wing versus rotary wing). Noise effects may be categorized as primary,
38 secondary, and tertiary. Primary effects include direct physical auditory impacts such as
39 eardrum rupture and hearing threshold shifts. Secondary effects include stress, behavioral
40 changes, and decreased ability to perform functions such as obtaining food. Tertiary effects
41 include population decline and habitat destruction. Stress and associated behavioral
42 changes may be among the more commonly observed effects of noise. A sudden or
43 unfamiliar sound may act as an alarm, activating the sympathetic nervous system and
44 triggering short-term physiological reactions (fight-or-flight response). These reactions cause
45 energy reserves to be used, may interrupt important behaviors, and may result in injury
46 (trampling, etc.). Conversely, wildlife may become habituated to repeated noise and show no
47 observable response over time. While birds, small mammals, and reptiles may experience

1 noise and associated effects to varying degrees, such species occurrences are expected to be
2 insignificant based on the condition of the HLZs (i.e., disturbed agricultural fields) and the
3 extent of use under the Proposed Action. Of most concern are domestic livestock near HLZ
4 locations.

5 Noise produced by aircraft overflights and helicopter hovering would likely disturb wildlife on
6 the LZs/HLZs and nearby vicinity. The potential for impacts due to overflights would be
7 greater than that associated with hovering. Birds may react by exhibiting a startle response.
8 Based on previous studies, and depending on the species and type of activity at the time of
9 exposure, response could range from simply looking toward the aircraft to flushing (and
10 associated energy expenditure) or other effects such as interruptions of nesting or breeding
11 and abandonment of young. Raptors would probably have the least potential for behavioral
12 reactions, while waterfowl and some passerines would be more likely to be affected.

13 Low-level flights would likely disturb or cause a startle reaction in mammal species. Although
14 the effects on some comparatively large mammals specifically found in the area (e.g., deer,
15 black bears) are uncertain, it may be assumed that noise levels greater than 90 dB would
16 cause at least some behavioral reaction such as freezing or fleeing. Various effects, including
17 startle effects and potential changes in habitat use, could occur in smaller mammal predators
18 such as coyotes and foxes. Although effects to small mammals such as squirrels, mice, and
19 rats have been suggested at noise levels from 69 to 115 dBA, based on discussion provided in
20 U.S. Air Force (2001), the effects are likely to be small.

21 In general, although wildlife species may exhibit startle or escape responses to aircraft
22 overflight, these responses are not necessarily detrimental long-term to a species, nor is
23 reaction to aircraft noise alone enough to imply adverse effect. Animals react to a variety of
24 external stimuli. Most affected individuals would likely resume normal activities soon after
25 training events are completed. Low-level aircraft flight noise is not expected to significantly
26 affect the overall health or viability of wildlife populations.

27 Short-term startle effects due to visual sightings of aircraft could cause temporary
28 displacement of individuals inhabiting areas surrounding the LZs/HLZs. However, animal
29 species would likely habituate to aircraft presence over time, given the ongoing tempo of
30 day-to-day training. Some degree of habituation may already exist for some individuals
31 because a variety of aircraft overflights by civilians, the FFS, and the military currently occurs
32 in the forest regions. Long-term reactions or significant behavior modifications are not
33 expected from visual aircraft sightings.

34 ***Amphibious Operations***

35 Aquatic wildlife may be directly impacted by a boat or indirectly impacted by disturbance or
36 harassment during amphibious operations, but usage of the water areas would be similar to
37 current recreational and commercial use and, therefore, would not be significant.

38 **Protected Species**

39 Impacts to protected species are similar in nature to those described previously for
40 vegetation and wildlife. Protected species could be directly impacted by vehicle collisions,
41 land disturbance, and expendables (from wildfire), but the impacts are not anticipated to be
42 significant because known species would be protected. Further, the effector mechanisms of
43 noise and human activity related to military training are not unlike that of recreational

1 hunting, logging, and other human activities that have been conducted at the forests for
2 many years. Thus, some species may have acclimated to noise and other disturbances.

3 Noise and human presence could disrupt feeding, breeding, and nesting activities, but the Air
4 Force would observe management practices as specified in EAFBI 13-212 that protect wildlife
5 and minimize disturbance from noise and human contact. Such measures include
6 establishing buffer areas around known RCW habitats. In addition, the Air Force would
7 familiarize troops with protected species, such as the Florida black bear and indigo snake, so
8 these animals would not be inadvertently injured or consumed during training. Areas
9 potentially slated for ground disturbance, such as road widening, would be cleared of gopher
10 tortoise burrows, and the animals would be relocated.

11 Wildfires can harm protected species, or their habitats. Fire response can involve heavy
12 equipment, such as fire plows, which can cut tree roots or, in wetland areas, change the
13 hydrology (water occurrence and flow) upon which protected species depend. The Air Force
14 would observe the FFS fire hazard index, which would minimize the potential for wildfire, and
15 would not use expendables near sensitive habitats.

16 **Sensitive Habitats**

17 Impacts to sensitive habitats are similar in nature to those described previously for vegetation
18 and wildlife. Known sensitive habitats would be protected, and areas potentially slated for
19 ground disturbance would be cleared of gopher tortoise burrows, which would be relocated
20 if necessary.

21 **Invasive Species**

22 Invasive species can be spread or introduced directly as units, vehicles, vessels, and
23 equipment move from one area of the forest to another and from other parts of the country.
24 Because humans can act as vectors for the spread of invasive species, vehicle traffic and
25 ground movements by troops could introduce and spread invasive species.

26 To reduce the potential of spreading invasive species, vehicles and equipment would be
27 cleaned before and after use in accordance with Armed Forces Pest Management Board
28 Technical Guide No. 31 *Retrograde Washdowns: Cleaning and Inspection Procedures* (U.S. Army,
29 2012). Vehicles and boats would not be used in areas with known invasive species problems.
30 Impacts to native vegetation from invasive species would not be significant.

31 Wildfire can create conditions that enable fast-growing invasive species to colonize burned
32 areas and become established before native vegetation. Wildfires caused by expendables
33 may also impact invasive species. Wildfires may provide an opening for invasive species to
34 spread. Conversely, invasive species may be killed in wildfires, thereby benefitting the health
35 of the forest.

36 **3.8.3.1 General Training Activity Impact Assessment Summary**

37 [Table 3-36](#) identifies potential interactions between Proposed Action effectors and biological
38 resource receptors. Activities shaded in green have little potential to impact the natural
39 environment or result in potential violations of federal, state, or local regulations. Therefore,
40 these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#). Activities
41 shaded yellow have the potential for adverse impacts and are carried forward for site-specific
42 analysis in Chapters [5](#) and [6](#).

Table 3-36. Receptor and Effector Interactions for Biological Resources

Proposed Action Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Land Disturbance	Protected species would be protected.		Known sensitive habitats would be protected.		Potential for activities to disperse invasive plants/seeds. However, implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize any potential adverse impacts. This issue has not been carried forward for site-specific analysis.
Land development	Potential for localized, nonprotected species annoyance (noise), displacement, or mortality. However, these impacts are expected to be low-intensity in nature and recoverable over the short-term given that land development activities would only occur on established roadbeds. No population effects have been identified. This issue has not been carried forward for detailed analysis.				
Point impact					
Incidental surface disturbance					
Consumption	Direct mortality to nonprotected species of wildlife. Potential to directly affect protected species (if misidentified). However, implementation of General Operational Constraints would minimize this impact potential to a neutral level. No population effects have been identified and this issue has not been carried forward for detailed site-specific analysis.				
Ground Movement	Known locations of protected species would be protected.		Known sensitive habitats would be protected.		
Wheeled vehicles	Wheeled vehicles would be used on approved roadways only. Minimal potential for incidental direct physical impact (e.g., being struck by vehicle). This issue has not been carried forward for site-specific analysis.		Wheeled vehicles would be used on approved roadways only. Water crossings (at approved locations) may interact with aquatic vegetation; however, these impacts are not considered significant given context, intensity, and implementation of General Operational Constraints and Proposed Resource-Specific Mitigations. This issue has not been carried forward for site-specific analysis.		
Dismounted maneuver	Potential for adverse impacts has been identified associated with incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). This issue has been carried forward for site-specific analysis.				
Use of Expendables	At BRSF, noise-generating expendables would only be used at hardened camp sites.				Potential adverse impacts have been identified associated with burned areas from wildfires started by expendable allowing establishment and spread of invasive species. This issue has been carried forward for site-specific analysis.
Blanks/GBS	Chemical components from smoke grenades and munitions by-products would potentially become available via ingestion or inhalation but this potential is considered minimal. Potential adverse impacts associated with disturbance from noise and wildfires from GBSs and smoke grenades has been carried forward for site-specific analysis.		Potential adverse impacts have been identified associated with wildfires from GBSs and smoke grenades. This issue has been carried forward for site-specific analysis.		
Smoke grenades					
Other/equipment	Use of generators may result in minor noise disturbance to wildlife species. Other expendables/equipment are not anticipated to interact with flora/fauna. This issue has not been carried forward for detailed site-specific analysis.				
Aircraft Operations	Known protected species locations would be protected and not used as HLZs/DZs or FWALS.		Potential adverse impacts have been identified from noise and activity disturbance. This issue has been carried forward for site-specific analysis.		Potential for activities to disperse invasive plants/seeds. However, implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize any potential adverse impacts. This issue has not been carried forward for site-specific analysis.
			Nonsensitive vegetation may be trampled at HLZs/DZs. However, given context and intensity this impact is considered negligible and has not been carried forward for site-specific analysis.		
Amphibious Operations	Known protected species locations would be protected and not used as HLZs/DZs or FWALS.		Potential for incidental direct physical impact (boat strike) or incidental indirect impact (disturbance or harassment). This issue has been carried forward for site-specific analysis.		Potential for activities to disperse invasive plants/seeds. However, implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize any potential adverse impacts. This issue has not been carried forward for site-specific analysis.
			Activities in estuarine areas could affect marsh vegetation, oyster reefs, or seagrass, as could water-land transition actions. Boat landings and nearshore activities would potentially affect shoreline vegetation in streams and rivers. This issue has been carried forward for site-specific analysis.		
Utilities	Utilities usage at hardened camp sites would have no interaction with biological resources. This issue has not been carried forward for site-specific analysis.				

BRSF = Blackwater River State Forest; FWALS = Fixed-Wing Aircraft Landing Sites; GBS = ground-burst simulator

3.8.4 Proposed Resource-Specific Mitigations

General Operational Constraints to minimize impacts to biological resources are identified in Section 2.5, and have been described in the analyses. These would be inherent to the Proposed Action. Additional Resource-Specific Mitigations have been identified that would further minimize impact potential or the severity of identified impacts; these are also included in the ESA Section 7 Consultation located in Appendix C:

- The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has recommended the following conservation measures: no low-water crossings or water-related training within 2 miles of the Blackwater River fish hatchery; avoidance of “Good” and “Poor” rated vehicle water crossings for training use in order to protect the better crossing sites, and minimizing further degradation of the sites in poor condition.
- Develop and implement a forest-specific process that will notify Eglin Natural Resources of the dates and locations of upcoming training events to support spot surveys/inspections for compliance.
- Survey proposed new training locations (including fixed wing aircraft landing sites and HLZs) for protected/sensitive species, and survey existing training areas at least every 3 years to identify any new sensitive species that have moved into the area. As necessary, update associated operational constraints and GLI Protection Level maps.
- Mark identified threatened and endangered plants on user maps and in the field. Prior to any activity that has the potential to create significant soil disturbance, conduct a survey for federally listed plants. If listed plants cannot be avoided, additional consultation under the ESA is required.
- Prior to any training activities and once specific training areas and corridors are identified for the upcoming year, these areas must be surveyed for bald eagle nests, and active trees must be marked. Coordinate with Eglin Natural Resources and the FFS to ensure that any necessary markings are completed prior to ground operations.
- Prior to any training activities, route requests for land disturbing activities through Eglin AFB and the FFS for approval.
- Follow guidance provided in the Eglin Environmental Guidebooks regarding approved plant and animal species for camouflage and consumption. Develop materials for military members to avoid inappropriate handling or consumption of wildlife, and clarify to ground troops that diamondback rattlesnakes are not to be consumed.
- Prior to any land disturbance (e.g., tree clearing for LOS), sensitive species surveys must be conducted, and any identified sensitive species and associated habitat must be avoided. If avoidance is not possible, then additional consultation under the ESA is likely to be required.
- Prior to driving across a low water stream crossing, check for turtles and allow them to clear the crossing before use.
- Avoid driving on roads with erosion issues; report any erosion issues to the GLI Liaison.

1 3.9 CULTURAL RESOURCES

2 Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other
3 physical or traditional evidence of human activity considered relevant to a particular culture
4 or community for scientific, traditional, religious, or other reasons. Each cultural resource
5 component is referred to as a “receptor.”

6 As defined under 32 CFR 800 (l)(1), “Historic Property means any prehistoric or historic district,
7 site, building, structure, or object included in, or eligible for inclusion in, the National Register
8 of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes
9 artifacts, records, and remains that are related and located within such properties. The term
10 includes properties of traditional religious and cultural importance to an Indian tribe or Native
11 Hawaiian organization and that meet the National Register criteria.”

12 The cultural resources sections in this EIS describe known historic properties within the
13 affected areas that are potentially eligible for the NRHP and evaluate whether elements of the
14 Proposed Action would potentially affect these resources. They include any archaeological
15 resources considered eligible, potentially eligible, or currently listed on the NRHP. This may
16 include historic structures, historic districts, any known historic cemeteries, traditional cultural
17 properties (TCPs), or sacred sites (SSs).

18 3.9.1 Impact Assessment Methodology

19 The impact assessment for cultural resources evaluates the potential impacts of the Proposed
20 Action to cultural resource receptors. Impacts to these resources are evaluated according to
21 type, context, intensity, and duration (as described in Section 3.1), as well as the regulatory
22 drivers identified below. Together, these factors define the potential significance of the
23 impacts.

24 3.9.1.1 Regulatory Drivers

25 Attention to cultural resources is necessary for the Air Force to comply with a host of federal
26 laws, regulations, and EOs, including:

- 27 • The NHPA of 1966, as amended. Under NHPA, the Air Force is required to consider the
28 effects of its undertakings on historic properties listed or eligible for listing on the
29 NRHP and to consult with interested parties regarding potential impacts per 36 CFR.
30 The regulatory NHPA Section 106 compliance process consists of four primary stages.
31 These include initiation of the Section 106 process (36 CFR 800.3); identification of
32 historic properties (36 CFR 800.4), which includes identifying historic properties
33 potentially affected by a proposed action; assessment of adverse effects
34 (36 CFR 800.5), which determines whether the action would affect historic properties
35 and if effects to those properties might be adverse; and resolution of adverse effects
36 (36 CFR 800.6) between affected and consulting parties such as the SHPO, the Advisory
37 Council on Historic Preservation, Indian tribes, and interested individuals. Additional
38 stipulations are provided for in the NHPA should efforts fail to resolve adverse effects
39 during this process (36 CFR 800.7).

- 1 • The DoD frames its Native American and Alaska Native Policy of 20 October 1998 in
2 terms that emphasize the responsibility of DoD personnel to consult with tribal
3 governments on a government-to-government basis very early in the decision-making
4 process. This policy memorandum requires an effort to increase understanding
5 between tribes and DoD personnel and to assess tribal positions on issues with
6 the potential to significantly affect protected tribal resources, tribal rights, and
7 Native American lands (DoD, 1998). Also applicable is DoDI 4710.02, *DoD Interactions*
8 *with Federally Recognized Tribes*, of September 14, 2006. This DoDI strengthens and
9 elaborates on the 1998 policy.
- 10 • The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25
11 USC 3001 et seq., as amended) addresses the protection of Native American burial
12 sites and regulates the removal and study of human remains, funerary objects, sacred
13 objects, and items of cultural patrimony on federal and tribal lands or by institutions
14 receiving federal funding.
- 15 • DoD Instruction 4715.03, *Environmental Conservation Program*, DoD Instruction
16 4715.16, *Cultural Resources Management*, and AFI 32-7065, *Cultural Resources*
17 *Management*, outlines and specifies procedures for Air Force cultural resource
18 management programs.

19 Other federal laws and regulations governing cultural resources include:

- 20 • Antiquities Act of 1906
- 21 • Historic Sites Act of 1935
- 22 • Archaeological and Historic Preservation Act of 1974
- 23 • Archaeological Resources Protection Act of 1979
- 24 • American Indian Religious Freedom Act of 1978
- 25 • 36 CFR 79, Curation of Federally Owned and Administered Archaeological Collections
- 26 • 43 CFR 7, Protection of Archaeological Resources
- 27 • 36 CFR 60, NRHP
- 28 • 36 CFR 63, Determinations of Eligibility for Inclusion in the National Register

29 Cultural resource-related EOs that may govern the Proposed Actions include:

- 30 • EO 11593, Protection and Enhancement of the Cultural Environment
- 31 • EO 13007, Indian Sacred Sites (SSs)
- 32 • EO 13175, Consultation and Coordination with Indian Tribal Governments
- 33 • EO 13287, Preserve America

34 **3.9.1.2 Assessment Method**

35 As stated in Chapter 2, the Air Force currently requires activity restrictions and limitations, as
36 well as avoidance and mitigation measures, to protect cultural resources on Eglin AFB. These
37 measures are designed to avoid impacts to these resources. Eglin AFB Range users also

1 observe procedures in EAFBI 13-212, where applicable, are included in GLI training
2 components as part of the Proposed Action. For purposes of this EIS, cultural resource
3 analysis assumed that avoidance and mitigation measures currently in place on Eglin AFB
4 would be implemented as part of the Proposed Action. If necessary, additional avoidance or
5 mitigation methods are recommended.

6 Cultural resources were analyzed by assessing each resource's state of investigation and
7 condition, then evaluating the resource as it intersects with the Area of Potential Effects (APE)
8 created by the Proposed Action. The ROI for this EIS is equivalent to the APE designation
9 utilized in the NHPA. As defined under 36 CFR 800.16(d), "the Area of Potential Effects is the
10 geographic area or areas within which an undertaking may directly or indirectly cause
11 changes in the character or use of historic properties, if such properties exist."

12 The APE is influenced by the scale and nature of the Proposed Action and may differ
13 according to the kinds of effects caused by the action. The APE for this project is assumed not
14 to extend beyond the footprint of the activity boundaries as defined under each alternative
15 training area.

16 NHPA obligations (as described herein) for a federal agency are independent from the NEPA
17 process and must be complied with even when environmental documentation is not
18 required. When both are required, the Air Force may coordinate NEPA compliance with their
19 NHPA responsibilities to ensure that historic properties, as defined under 36 CFR 800.16(l)(1),
20 are given adequate consideration. As per AFI 32-7065, Section 3.3.1, and 36 CFR 800.8(a), the
21 Air Force has chosen to incorporate NHPA Section 106 review into the NEPA process, rather
22 than substituting the NEPA process for a separate NHPA Section 106 review of alternatives
23 (AFI 32-7065, Section 3.3.2, and 36 CFR 800[c]).

24 Properties identified in the APE by the Air Force are evaluated according to the NRHP criteria,
25 in consultation with the SHPO and other parties. Typically, if the SHPO and other parties and
26 the Air Force agree in writing that a historic property is eligible or not eligible to the NRHP,
27 that judgment is sufficient for purposes of Section 106 (36 CFR 800.4[c][2]). Relevant
28 procedures and criteria can be found in 36 CFR 63, Determinations of Eligibility for Inclusion
29 in the National Register of Historic Places.

30 Formal initiation of the Section 106 process began with notification to the Florida SHPO and
31 ACHP on December 18, 2013, of the Proposed Action and anticipated impacts. Also, five
32 federally recognized tribes were notified of the Proposed Action on December 18, 2013, in
33 accordance with the NHPA. Subsequent follow-on phone calls to the five federally
34 recognized tribes were made in January 2014 (see Appendix C for a full record of
35 correspondence). A government-to-government letter was mailed in February 2014.
36 Information regarding these consultations and notifications are provided in Appendix C,
37 *Consultation Documentation*.

38 [Table 3-37](#) defines how the impact attributes of context, intensity, and duration are applied to
39 the cultural resource analysis.

Table 3-37. Definitions of Impact Attributes for Cultural Resources Categories

Attribute	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Contexts Analyzed						
Regional	Impacts to the historical context of the state forest, TCPs, or historic districts within the forest.					
Localized	Impacts to individual resources, specific sites, or locations.					
Intensity (can be either adverse or beneficial)						
High	Substantive impact that results in respective change in overall stability or character of cultural resources. Examples of adverse impacts are high- to medium-intensity ground disturbance activities resulting in alteration of a historic, archaeological, or cultural site or property that affects the overall historical context of the site.					
Medium	Moderate impact that results in respective change in stability or character of cultural resources. Examples of adverse impacts include high- to medium-intensity ground disturbance activities that result in the alteration/destruction of one or more artifacts associated with a historic, archaeological, or cultural site or property that does not affect the overall historical context of the site.					
Low	Slight impact that results in potential disturbance of cultural resources but does not result in the alteration or destruction of a historic, archaeological, or cultural site or associated artifacts. Examples of adverse impacts include incidental ground disturbance associated with walking/driving, utilization of stakes for tents, etc.					
Neutral	No impact on present cultural resources and no change to the character or nature of historic, social, or traditional context.					
Duration						
Long term	Effect would likely endure for the life of the action as cultural resources are nonrenewable and individually unique in nature. Any damage to a resource is considered permanent and nonreversible.					

TCP = traditional cultural property; SS = sacred site

2 If a cultural resource is impacted, mitigations or avoidance measures would be required
 3 regardless of impact context, duration, and/or intensity. However, the scope of mitigations or
 4 avoidance would be based on context and duration of the impact.

5 **3.9.1.3 Impact Levels**

6 The level of impact associated with cultural resources and the impact's potential significance
 7 is determined by considering how Proposed Action effectors could interact with cultural
 8 resources in terms of context, intensity and duration as described in [Table 3-37](#). For purposes
 9 of this EIS, there are two types of effects when considering historic properties, which are
 10 defined by 36 CFR Section 800.5:

- 11 • Adverse Effect: "When an undertaking may alter, directly or indirectly, any of the
 12 characteristics of a historic property that qualify the property for inclusion in the NRHP
 13 in a manner that would diminish the integrity of the property's location, design,
 14 setting, materials, workmanship, feeling, and association" (36 CFR 800.5(a)(1)). Based
 15 on context and intensity factors identified in [Table 3-37](#) and the NHPA regulatory
 16 definitions of impact, the Air Force has identified the potential for adverse impacts to
 17 cultural resources. However, the Air Force has notified the ACHP, Florida SHPO, and
 18 applicable Native American tribes about this Proposed Action. Consultation
 19 documents under the NHPA Section 106 will be provided in Appendix C, *Consultation*
 20 *Documentation*, and results of the consultation process will be included in the Final
 21 EIS.
- 22 • No Adverse Effect: "When the undertaking's effects do not meet the criteria of
 23 paragraph (a)(1) of this section or the undertaking is modified or conditions are

1 imposed, such as the subsequent review of plans for rehabilitation by the SHPO/THPO
 2 to ensure consistency with the Secretary’s Standards for the Treatment of Historic
 3 Properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects” (36 CFR
 4 800.5(b)).

5 [Table 3-38](#) explains the impact level categories for cultural resources analyzed in this EIS and
 6 identified in Chapters [4](#), [5](#), and [6](#).

7 **Table 3-38. Impact Level Categories for Cultural Resources**

Level of Impact	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Adverse but not significant	Adverse effects occur when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, and association. The potential for regional or localized high- to medium-intensity or low-intensity long-term impacts to currently unidentified historic properties that may require mitigation or resource avoidance. Reduction or improvement in adverse effects only occurs through avoidance of the resource or mitigation of effects.					
No adverse effect	Localized or regional actions that do not affect historic properties. Either no historic properties are present or there are historic properties present but the Proposed Action would have no effect upon these properties.					

TCP = traditional cultural properties; SS = sacred sites; NRHP = National Register of Historic Places

8 **3.9.2 General Emitter Activity Impact Assessment**

9 Based on scope of action described in Chapter [2](#), emitter site use would not be expected to
 10 result in impacts to cultural resources, because emitters would be located on property already
 11 heavily modified and disturbed with existing infrastructure in place. As a result, this resource
 12 area is not carried forward for site-specific analysis in Chapter [4](#).

13 **3.9.3 General Training Activity Impact Assessment**

14 Analysis focused on potential adverse effects to cultural resources due to physical
 15 disturbance from troop movements, bivouacking, and other ground-disturbing activities.
 16 General Operational Constraints to alleviate potential adverse effects to cultural resources
 17 from mission activities are detailed in Section [2.5](#). Under the Proposed Action, these
 18 requirements would be implemented or, in some cases, certain areas would be avoided.

19 Cross-country ground operations, bivouacking, and other ground-disturbing activities could
 20 displace or destroy cultural resources. Dismounted movements are more likely to affect
 21 archaeological sites in areas where soil is exceptionally soft or devoid of vegetation, where
 22 activities occur on steep slopes such as along stream banks or interior gullies, or where
 23 artifacts are located on ground surface. To avoid impacts from any cross-country training
 24 operations, units must coordinate with FFS staff and the Eglin AFB 96th Civil Engineer
 25 Group/Environmental Assets (96 CEG/CEIEA) Cultural Resources Office to determine
 26 avoidance areas and only conduct ground-disturbing activities in areas known to be devoid
 27 of historic properties. If cultural resources are unexpectedly discovered during the course of
 28 proposed activities, all activity in the immediate vicinity would cease until FFS staff or the
 29 Cultural Resources Office has been notified and a determination of significance has been
 30 rendered.

1 AO can affect cultural resources if such resources are either submerged and hidden or located
 2 on riverbanks or along shorelines where landings occur. If direct impacts to cultural resources
 3 occur during AO, these impacts would be more likely to damage resources, due to the
 4 exposed surface conditions and loosely consolidated sand and soils in this type of
 5 environment.

6 Based on the scope of action described in Chapter 2, some of the training activities could
 7 have some interaction with cultural resources. [Table 3-39](#) identifies potential interactions
 8 between Proposed Action effectors and cultural resource receptors. Items shaded yellow
 9 have the potential for adverse impacts and have been carried for site-specific analysis in
 10 Chapters 5 (BRSF) and 6 (THSF). Activities shaded in green have little potential to impact
 11 cultural resources or result in potential violations of federal, state, or local regulations.
 12 Therefore, these activities are not carried forward for detailed analysis in Chapters 5 and 6.

13

Table 3-39. Receptor and Effector Interactions for Cultural Resources

Proposed Action Effector	Cultural Resource Area Potentially Affected (Receptor)					
	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Land Disturbance	Land disturbance has the potential to adversely affect cultural resources. Avoidance of eligible resources or unsurveyed areas where the attempt to identify cultural resources has not occurred is required. This issue has been carried forward for site-specific analysis.					
Land development						
Point impact						
Incidental surface disturbance						
Consumption	This activity would have no interaction with cultural resources. This issue has not been carried forward for site-specific analysis.					
Ground Movement						
Wheeled vehicles	Wheeled vehicles would be used on currently used and approved roadways and crossing areas. Adverse effects to cultural resources are not anticipated. This issue has not been carried forward for site-specific analysis.					
Dismounted maneuver	Potential for direct impacts to cultural resources could occur from this activity. Avoidance of eligible resources or unsurveyed areas would be required where no attempt has been made to identify cultural resources. This issue has been carried forward for site-specific analysis.					
Use of Expendables	This activity would have no interaction with cultural resources. This issue has not been carried forward for site-specific analysis.					
Aircraft Operations	This activity would have no interaction with cultural resources. This issue has not been carried forward for site-specific analysis.					
Amphibious Operations	This activity would have the potential to adversely affect cultural resources. Avoidance of eligible resources or unsurveyed areas where the attempt to identify cultural resources has not occurred is required. This issue has been carried forward for site-specific analysis.					
Utilities	This activity would have no interaction with cultural resources. This issue has not been carried forward for site-specific analysis.					

TCP = traditional cultural property; SS = sacred site

1 **3.9.4 Proposed Resource-Specific Mitigations**

2 Based on general impact analyses presented in Section [3.9](#), no Resource-Specific Mitigations
3 have been identified for cultural resources in this chapter. Implementation of General
4 Operational Constraints described in Section [2.5](#) would serve to minimize any identified
5 adverse impacts.

6 **3.10 LAND USE**

7 “Land use” typically refers to the management and use of land by people. Components of
8 land use include general land use patterns, land ownership, land management plans, and
9 special use areas. General land use patterns characterize the types of uses within a particular
10 area. Specific uses of land typically include agriculture, barren land, rangeland,
11 transportation/communications/utilities, forested, urban/built up, water, and wetlands. Land
12 use also includes areas set aside for preservation or protection of natural resources, wildlife
13 habitat, vegetation, or unique features. Management plans, policies, ordinances, and
14 regulations determine the types of uses that protect specially designated or environmentally
15 sensitive areas (NFWMD, 2007).

16 Each land use component is referred to as a “receptor.” For purposes of this EIS, the two main
17 land use receptors considered are landowners and recreational users within and adjacent to
18 the land areas proposed for use.

19 **3.10.1 Impact Assessment Methodology**

20 The impact assessment for land use evaluates the potential impacts of the Proposed Action
21 on landowners and recreational users. Impacts to these land use receptors are evaluated
22 according to type, context, intensity, and duration (as described in Section [3.1](#)), as well as the
23 regulatory drivers identified below. Together, these attributes define the potential
24 significance of the impacts.

25 **3.10.1.1 Regulatory Drivers**

26 [Table 3-40](#) summarizes the regulations and planning documents applicable to land use under
27 the Proposed Action. All activities would be conducted according to the guidelines
28 presented in these documents and regulations.

Table 3-40. Applicable Land Use Regulations and Planning Documents

Name of Regulation/Planning Document	Description
Designated Multiple-Use of the Property, Florida Statute 589.04(3)	Permits a variety of activities on Florida state land with a focus on restoring, protecting, and managing ecosystems while at the same time integrating public use.
Air Force Instruction 32-7064; Integrated Natural Resources Management	Addresses the management of natural resources on Air Force properties to comply with federal, state, and local standards.
Blackwater River State Forest 5-Year Resource Management Plan	Provides guidelines and a framework for preserving natural resources within the state forest with a specific focus on the multiple-use concept.
Ten-Year Resource Management Plan for Tate's Hell State Forest	Outlines management goals and guidelines for maintaining a balance between the preservation of natural resources while integrating the multiple-use concept.
Eglin AFB Instruction (EAFBI) 13-212, Range Planning and Operations, Chapter 7 – Environmental Management (December 2010, Interim Change on 32 September 2011)	Identifies requirements for protection of natural and cultural resources and waste management. These guidelines would be adopted and adhered to throughout the course of the Proposed Action.

3.10.1.2 Assessment Method

Typically, impacts to land use involve changes in the designated land use status and the manner in which the land may be utilized by people. In certain circumstances, incompatibilities in land use may arise and require further planning or consultations between landowners until an agreeable designation is issued. Impacts can be assessed by identifying current uses and proximity to sensitive populations and determining the degree to which they would be affected by the Proposed Action and alternatives.

Impacts from noise associated with the Proposed Action are a potentially significant factor in land use compatibility. Noise generated by the setup and operation of emitter sites, as well as noise associated with the various training activities, particularly the use of HLZs and FWALS, could temporarily impact recreational use as well disturb adjacent landowners. Major recreational uses near the emitter sites and at BRSF and THSF that could experience potential impacts include hunting, fishing, hiking, and camping. Although noise impacts are not anticipated to permanently preclude these activities, recreational users may experience temporary disturbances that would conflict with or temporarily preclude these activities while HLZs and FWALS are in use. The mitigation measures discussed in Chapter 2 would help minimize or eliminate some of the impacts felt by recreational users and adjacent landowners. See Section 3.3, *Noise*, for more details regarding the extent and duration of potential noise impacts associated with emitter sites and training activities. Sections 5.10 and 6.10 (Land Use analysis for BRSF and THSF, respectively) further detail the specific types of recreational areas and activities at BRSF and THSF.

3.10.1.3 Impact Levels

The level of impact associated with land use receptors and the impact's potential significance is determined by considering how Proposed Action effectors could interact with land use in terms of context, intensity, and duration as described in Table 3-41. Table 3-42 explains the impact level categories for land use analyzed in this EIS and identified in Chapters 4, 5, and 6.

1

Table 3-41. Definitions of Impact Attributes for Land Use

Attribute	Land Use Designation	Recreational Use	Landowners
Contexts Analyzed			
Regional/population/recreational areas/management areas	County level, state park level, recreational area, or management unit level effects; impacts to populations and multiple landowners.		
Localized	Less than management area effects; impacts to individuals and specific landowners.		
Intensity (can be either adverse or beneficial)			
High Mitigation measures required to minimize/avoid adverse impacts, with scope of the mitigations based on context and duration of the impact.	Substantive and noticeable changes to land use designations resulting in removal of incompatible land use designations, or introduction of new designations resulting in incompatibility and/or a violation of laws, regulations, or land use management policies.	Substantive change in recreational use resulting in relative improvement of the recreational experience or conflicts such that lack of compatibility would prohibit recreational activities from occurring. Such impacts would consist of opening of new recreational areas or creation of new restricted areas (RAs).	Substantive and noticeable changes in land use resulting in relative improvement in adjacent landowner's property values, convenience, or potential annoyance factors, or actions that result in conflict with landowners such that property values decline and activities are incompatible with current landowner uses.
Medium Mitigations may be required to avoid adverse impacts depending on context and duration of the impact.	Moderate changes to land use designations resulting in relative improvement of current incompatible land use designations (e.g., change from industrial to commercial), or changes in current designations resulting in a temporary or resolvable conflict of land use compatibility that does not result in a violation of laws, regulations, or land use management policies.	Moderate change in recreational use resulting in relative improvement of the recreational experience or conflicts. Such impacts may result in temporary restrictions on recreational use or occasional annoyance or removal of existing temporary restrictions.	Moderate impacts to landowners would be anticipated, such as occasional inconvenience or annoyance. These impacts would have no effect on property values or current use.
Low No mitigations required.	Negligible change in land use designation. Not anticipated to result in any relative changes in current land use compatibility.	Negligible impacts to recreational users. May result in minor, infrequent annoyance but would not prohibit recreational activities.	Negligible impacts to adjacent landowners. May result in infrequent, minor annoyance but would not result in conflicts with adjacent landowners or result in changes to property values.
Neutral	Impacts to land use that would cause no apparent change in land use designations and would not result in land use compatibility conflicts.	No impacts to recreational users.	No impacts to adjacent land owners.
Duration			
Long term	Effect would likely endure for the life of the action.		
Medium term	Effect would likely last for a few months to a year.		
Short term	Effect would likely last for a few days to weeks.		

1

Table 3-42. Impact Level Categories for Land Use

Level of Impact	Land Use Designation	Recreational Use	Landowners
Adverse	Adverse impacts may result in changes in regional or local land use designations, the level of impact directly related to the impact attributes described in Table 3-41 . Adverse impacts may be perceived as significant under high-intensity scenarios at any duration where permanent changes in land use designations result in conflict with existing land use management plans, statutes, or other policies. Insignificant impacts may occur under medium- to low-intensity scenarios of any duration causing a temporary or resolvable conflict of land use compatibility.	Adverse impacts may result in recreational use conflicts or preclude recreational use, the level of impact directly related to the impact attributes described in Table 3-41 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration if permanent conflicts preclude recreational use. Insignificant impacts may occur under high- to medium-intensity scenarios of any duration that may cause temporary recreational use conflicts.	Adverse impacts may result in annoyance or conflicts with landowners, the level of impact directly related to the impact attributes described in Table 3-41 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration if they cause substantial long-term annoyance and/or permanent conflicts to affected landowners. Insignificant impacts may occur under any intensity of any duration resulting in infrequent, minor annoyance but no conflicts with adjacent landowners or result in changes to property values.
Neutral/no effect	Activities do not result in a conflict of land use compatibility regardless of intensity.	Activities would not prohibit or otherwise interfere with recreational uses, regardless of intensity.	Activities would not cause a conflict with landowners, regardless of intensity.

2 **3.10.2 General Emitter Activity Impact Assessment**

3 The main issues affecting land use would be associated with the safety hazards from emitters
4 and the potential for emitter SHDs (as described in Section [3.4, Safety](#)) to encroach on existing
5 land uses, thus resulting in incompatibility. While the EMR, as expressed in SHDs associated
6 with the emitters, is unlikely to impact/change existing land use designations or recreational
7 opportunities, or conflict with adjacent land owners, site-specific analysis of land use has
8 been carried forward to Chapter [4](#).

9 **3.10.3 General Training Activity Impact Assessment**

10 Adverse impacts to recreational users may occur as a result of temporary annoyance from
11 noise during training activities (see Section [3.3, Noise](#)). These impacts would mainly occur in
12 the interstitial areas between identified recreational sites, because recreational sites identified
13 would be avoided for noise-generating activities such as aircraft overflights and expendable
14 use (see Section [3.3, Noise](#)). While the quality of the recreational experience may be
15 somewhat diminished by noise impacts, this would not preclude recreational use or cause
16 general incompatibility, and impacts would be short term. Additionally, conflicts with
17 hunters would not occur because training activities would be restricted in the daytime during
18 hunting season.

1 Overall, there would be some small-scale, temporary public access restrictions to specific
 2 training locations while training occurs. Some temporary road segment closures would result
 3 at FWALS locations and during BD. However, this would not negatively impact overall land
 4 use because this would only occur on small segments of roadway and would be short-term in
 5 nature; access would resume once training activities have ceased. These segment closures
 6 would not affect access to parts of the forests because there are sufficient roadways available
 7 to go around the closed segments. Access to HLZ/DZ locations would also be temporarily
 8 restricted while training activities occur; however, there would only be a few active HLZs/DZs
 9 at any given time, and use would be infrequent.

10 Noise and safety impacts affecting land use for adjacent landowners would be mitigated
 11 through implementation of General Operational Constraints identified in Section 2.5, and
 12 Proposed Resource-Specific Mitigations identified in Section 3.3 (Noise) and Section 3.4
 13 (Safety). Overall, the Air Force has not identified any changes to land use designations or
 14 significant land use conflicts.

15 **3.10.3.1 General Training Activity Impact Assessment Summary**

16 Based on the scope and nature of activities described in Chapter 2, no changes to land use
 17 designations are anticipated. However, several training activities could produce noise that
 18 may have a temporary, low-level impact on recreational users and landowners within the
 19 state forests. Table 3-43 identifies potential interactions between Proposed Action effectors
 20 and land use receptors; these activities are shaded yellow and carried forward in Chapters 5
 21 and 6 for detailed site-specific analysis. Activities shaded in green have little potential to
 22 impact public health or safety or the human and natural environment or do not result in
 23 potential violations of federal, state, or local regulations. Therefore, these activities are not
 24 carried forward for detailed analysis in Chapters 5 and 6.

25 **Table 3-43. Receptors and Effector Interactions for Land Use Resources**

Proposed Action Effector	Land Use Resource Area Potentially Affected (Receptor)		
	Land Use Designations	Recreational Users	Landowners
Land Disturbance	Overall, no anticipated impact. Any required land-disturbing activities would be conducted in accordance with applicable guidelines and regulations. This issue has not been carried forward for site-specific analysis.		
Land development	Land development activities under the Proposed Action are associated with FWALS improvements and possibly addition of gravel surfaces at HLZs/DZs for vehicle parking. Roadways used as FWALS would still be utilized as roadways, and addition of gravel surfaces would not change land use designations. There would be no effects to recreational users or landowners from these actions. This issue has not been carried forward for site-specific analysis.		
Point impact	These types of land disturbance would have no impact on land use, recreational users, or landowners. This issue has not been carried forward for detailed, site-specific analysis.		
Incidental surface disturbance			
Consumption			
Ground Movement	Overall, no anticipated impact. Ground movements would be conducted in accordance with applicable guidelines and regulations. In addition, ground movements would be specifically timed in order to reduce or eliminate impacts to recreational users and landowners. For example, during hunting season, ground movements would occur only from 2 hours after sunset to 2 hours before sunrise to minimize conflicts during hunting season. Additionally, ground movements would avoid inhabited recreational sites and private property. Temporary access restrictions to small portions of the forests (road segments, HLZs/DZs) would have no overall impact on land use. This issue has not been carried forward for site-specific analysis.		
Wheeled vehicles			
Dismounted maneuver			

Table 3-43. Receptors and Effector Interactions for Land Use Resources, Cont'd

Proposed Action Effector	Land Use Resource Area Potentially Affected (Receptor)		
	Land Use Designations	Recreational Users	Landowners
Use of Expendables Blanks/GBS Smoke grenades Other/equipment	Potential adverse impacts have been identified associated with noise as a result of using expendables. This issue has been carried forward for site-specific analysis.		
Aircraft Operations	Potential adverse impacts have been identified associated with noise as a result of aircraft operations. This issue has been carried forward for site-specific analysis.		
Amphibious Operations	No anticipated impact. Amphibious Operations would be conducted in accordance with applicable guidelines and regulations. Amphibious Operations would be conducted in a manner to avoid public boaters and no power motors would be used in Bear Lake (BRSF). Since these activities would occur in uninhabited areas, no significant noise impacts to recreational users or landowners are anticipated. This issue has not been carried forward for site-specific analysis.		
Utilities	No anticipated impact. Usage of utilities would not be expected to result in impacts to land use designations, recreational users, or landowners. This issue has not been carried forward for site-specific analysis.		

BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground burst simulator; HLZ = helicopter landing zone

1 **3.10.4 Proposed Resource-Specific Mitigations**

2 Based on general impact analyses presented in Section 3.10, no Resource-Specific Mitigations
3 have been identified for land use in this chapter. Implementation of General Operational
4 Constraints described in Section 2.5 would serve to minimize any identified adverse impacts.

5 **3.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE**

6 Within the context of this EIS, "socioeconomic resources" refers to the populations, economic
7 activity, recreation, and tourism associated with the surrounding areas proposed for use.
8 "Environmental justice" refers to the potentially affected populations that meet certain
9 characteristics based on race, income, and age. Each socioeconomics and environmental
10 justice resource components is referred to as a "receptor."

11 **3.11.1 Impact Assessment Methodology**

12 The impact assessment for socioeconomics and environmental justice evaluates the potential
13 impacts of the Proposed Action on socioeconomic and environmental justice receptors.
14 Impacts to these resources are evaluated according to type, context, intensity, and duration
15 (as described in Section 3.1), as well as the regulatory drivers identified below. Together,
16 these factors define the potential significance of the impacts.

17 **3.11.1.1 Regulatory Drivers**

18 Laws and regulations applicable to the Proposed Action for socioeconomics and
19 environmental justice are summarized in this section.

- 1 • There is no applicable regulatory setting for socioeconomic.
- 2 • EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and*
3 *Low-Income Populations*, directs federal agencies to address environmental and
4 human health conditions in minority and low-income communities.
- 5 • EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*,
6 directs federal agencies to identify and assess environmental health and safety risks
7 that may disproportionately affect children.

8 **3.11.1.2 Assessment Method**

9 The assessment method described below was applied to socioeconomic and environmental
10 justice receptors identified within the Proposed Action ROIs as described in Sections [4.11.1](#),
11 [5.11.1](#), and [6.11.1](#). There are no specific guidelines on assessment of socioeconomic resources
12 but in general, any federal action that would result in a change in the spatial distribution of
13 populations, spending patterns, employment, income, or public services would be
14 considered an impact. Under the Proposed Action, there would be no change to populations;
15 as a result, population impacts are not addressed in this EIS.

16 Analysis of impacts to environmental justice focused first on identifying potentially significant
17 adverse impacts identified for any of the resource areas described in this EIS. If no potentially
18 significant impacts to any populations were identified, environmental justice concerns were
19 not considered further. For purposes of this EIS, the ROI for the environmental justice analysis
20 is the county, which served as the region of comparison, and analysis focused on the
21 demographics of specific affected populations for each of the alternatives evaluated. Where
22 potentially significant impacts were identified, the percentage of low-income and minority
23 persons and children under 18 were calculated for the ROI. These percentages were
24 compared with those of the region of comparison to determine if the affected population is
25 disproportionately composed of low-income and minority persons and children (i.e., has
26 higher percentages).

27 Data relative to race and age were derived from the 2010 decennial census. For the purposes
28 of this analysis, “children” were defined as persons age 17 and younger. The 2010 census
29 does not contain any data relative to income; therefore, low-income populations were
30 identified using data from the 2007–2011 American Community Survey (ACS) 5-year
31 estimates. The ACS 5-year estimates constitute the most recent data set available from the
32 Census Bureau that tabulates data relative to income at the census tract level of geography.

33 [Table 3-44](#) defines how the impact attributes of context, intensity, and duration are applied to
34 socioeconomic and environmental justice analyses.

1 **Table 3-44. Definitions of Impact Attributes for Socioeconomics and Environmental Justice**

Attribute	Socioeconomics	Environmental Justice
Contexts Analyzed		
Regional	Impacts to populations within the region of Influence (typically considered the county) or beyond.	
Localized	Impacts to individuals within a certain geographical area smaller in size than the county (i.e., city, town, census tract, or block).	
Intensity (can be beneficial or adverse)		
High	Substantive and noticeable effect to socioeconomic characteristics that the market can adjust to over the long term, such as large number of jobs created or lost within a community. Extensive mitigations required to minimize adverse impacts; scope determined by context and duration of the impact.	Substantive and noticeable disproportionate effect to the health or economic conditions of minority, low-income, and youth populations as a result of significance threshold exceedance for identified resource areas (e.g., safety, land use). Extensive mitigations required to minimize adverse impacts; scope determined by context and duration of the impact.
Medium	Noticeable effect to socioeconomic characteristics that the market can adjust to within the short to medium term, such as increased incidental spending of military personnel during training activities or minor reduction in income over the medium to short term. Mitigations may be required to minimize adverse impacts; scope determined by context and duration of the impact.	Noticeable disproportionate effect to the health or economic conditions of minority, low-income, and youth populations that do not exceed resource-specific significance threshold criteria. Mitigations may be required to minimize adverse impacts; scope determined by context and duration of the impact.
Low	Minimal change in socioeconomic characteristics that the market can adjust to immediately. No mitigations required.	Minimal effect to the health or economic conditions of minority, low-income, and youth populations that is not disproportionate and does not result in exceedance of any significance thresholds. No mitigations required.
Neutral	No discernable effect to socioeconomic resource conditions.	No discernable effect to minority, low-income, or youth populations.
Duration		
Long term	Effect would likely endure for more than a year after the activity.	
Medium term	Effect would likely last for a few months to a year after the activity.	
Short term	Effect would likely last only for the duration of the activity.	

2 **3.11.1.3 Impact Levels**

3 The level of impact associated with socioeconomics and environmental justice and the
4 impact's potential significance is determined by considering how Proposed Action effectors
5 could interact with socioeconomics and environmental justice resources in terms of context,
6 intensity, and duration as described in [Table 3-44](#). [Table 3-45](#) explains the impact level
7 categories for socioeconomics and environmental justice resource categories analyzed in this
8 EIS and identified in Chapters [4](#), [5](#), and [6](#).

1 **Table 3-45. Impact Level Categories for Socioeconomics and Environmental Justice**

Level of Impact	Socioeconomics	Environmental Justice
Adverse	Adverse impacts may result in negative changes to socioeconomic characteristics such as job numbers or spending, the level of impact directly related to the impact attributes described in Table 3-44 . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration that require long-term market adjustments and extensive mitigation. Insignificant impacts may occur under medium-intensity scenarios of any duration requiring medium- to short-term market adjustments and minimal mitigation.	Adverse impacts may affect the health or economic conditions of minority, low-income, or youth populations, the level of impact directly related to the impact attributes described in Table 3-44 . Adverse impacts may be perceived as significant under medium- to high-intensity scenarios of any duration resulting in substantive and noticeable disproportionate health or economic effects. Insignificant impacts may occur under low-intensity scenarios of any duration and have negative health or economic effects but they are not disproportionate and only require minimal mitigation.
Neutral/no effect	Activities do not result in adverse impacts to socioeconomic conditions and require no mitigation.	Activities do not result in adverse effects to the health or economic conditions of minority, low-income, or youth populations within the ROI.

ROI = region of influence

2 **3.11.2 General Emitter Activity Impact Assessment**

3 Socioeconomic and environmental justice impacts are relative to the site-specific location of
 4 the proposed emitter sites. In general, there would be minimal socioeconomic impacts
 5 associated with emitter activity. These would be related to increased revenue to the FFS from
 6 Air Force lease of emitter sites and incidental local spending from military personnel while
 7 involved in a training action. Potential impacts to the general public associated with safety
 8 and land use resulting emitter placement and use are described in Sections [3.4 \(Safety\)](#) and
 9 [3.10 \(Land Use\)](#), respectively. These impact analyses, as well as potential environmental
 10 justice-related issues resulting from safety and land use impacts have been carried forward
 11 for site-specific analysis in Chapter [4](#).

12 **3.11.3 General Training Activity Impact Assessment**

13 **Economic Activity**

14 No significant adverse impacts to socioeconomic resources would result from Proposed
 15 Action activities. Ground and vehicular movement in the forest would occur on designated
 16 roads. Road maintenance is costly to the FFS, and additional road usage and ISD from ground
 17 movement could create an additional expense. However, the number of people and vehicles
 18 and the frequency of training activities proposed to occur would not be anticipated to add
 19 significant maintenance costs. In addition, the FFS would constrain the time, frequency, and
 20 types of activities to avoid conflicts with hunters, campers, boaters, and other recreational
 21 users to avoid negatively impacting visitor usage.

1 A concern was expressed during the scoping comment period that housing values would be
2 negatively impacted by noise associated with military training activities in the forest. There
3 are many factors that influence the market value of a home including location, square
4 footage, amenities, year built, and surrounding environmental conditions such as noise and
5 safety. However, based on Sections [3.3 \(Noise\)](#) and [3.4 \(Safety\)](#), the training activities would
6 avoid noise sensitive locations such as residences, schools, etc., therefore no significant
7 impacts to housing values would be anticipated as a result of the proposed action.

8 **Recreation and Tourism**

9 While training activities under the Proposed Action would not result in significant adverse
10 impacts to recreation and tourism, training activities may result in adverse impacts from
11 noise, safety, and land use impacts as described in Sections [3.3 \(Noise\)](#), [3.4 \(Safety\)](#), and [3.10](#)
12 [\(Land Use\)](#), respectively. As described in Chapter [2](#), the FFS would constrain the time,
13 frequency, and types of activities to avoid conflicts with hunters, campers, and boaters. Some
14 recreational users, such as hikers, may be annoyed by noise from aircraft operations.

15 **Environmental Justice and Special Risks to Children**

16 Environmental justice impacts and special risks to children may result from noise, safety, and
17 land use impacts as described in Sections [3.3 \(Noise\)](#), [3.4 \(Safety\)](#), and [3.10 \(Land Use\)](#),
18 respectively. No other significant impacts for this action have been identified that would
19 impact environmental justice or pose special risks to children.

20 **3.11.3.1 General Training Activity Impact Assessment Summary**

21 Based on the scope of action described in Chapter [2](#), most training activities would have at
22 least some interaction with socioeconomics and environmental justice resources. [Table 3-46](#)
23 identifies potential interaction between Proposed Action effectors and socioeconomics and
24 environmental justice resource receptors. Activities shaded in yellow have the potential to
25 impact the public health and safety and the human and natural environment and are carried
26 forward for detailed analysis in Chapters [5](#) and [6](#). Activities shaded green have little potential
27 to impact public health or safety or the human and natural environment or do not result in
28 potential violations of federal, state, or local regulations. Therefore, these activities are not
29 carried forward for detailed analysis in Chapters [5](#) and [6](#).

1 **Table 3-46. Receptor and Effector Interactions for Socioeconomics and Environmental Justice**

Proposed Action Effector	Resource Area Potentially Affected (Receptor)					
	Socioeconomics			Environmental Justice		
	Population	Economic Activity	Recreation and Tourism	Minority	Low-Income	Youth
Land Disturbance						
Land development	No interaction. This issue has not been carried forward for site-specific analysis.		No identified adverse impacts associated with noise and safety (see Sections 3.3 [Noise] and 3.4 [Safety]). This issue has not been carried forward for site-specific analysis.	No interaction. This issue has not been carried forward for site-specific analysis.		
Point impact	No interaction. This issue has not been carried forward for site-specific analysis.					
Incidental surface disturbance	No interaction. This issue has not been carried forward for site-specific analysis.					
Consumption	No interaction. This issue has not been carried forward for site-specific analysis.					
Ground Movement						
Wheeled vehicles	No interaction. This issue has not been carried forward for site-specific analysis.	Potential increase in costs associated with additional road maintenance. However, this impact would be negligible and recoverable through leasing fees. This issue has not been carried forward for site-specific analysis.	No identified adverse impacts associated with noise and safety (see Sections 3.3 [Noise] and 3.4 [Safety]). This issue has not been carried forward for site-specific analysis.	No interaction. This issue has not been carried forward for site-specific analysis.		
Dismounted maneuver	No interaction. This issue has not been carried forward for site-specific analysis.					
Use of Expendables						
Blanks/GBS	Potential for adverse impacts associated with disturbance from noise and safety concerns to the public have been identified. This issue has been carried forward	No interaction. This issue has not been carried forward for site-specific analysis.	Potential for adverse impacts associated with disturbance from noise and safety concerns to the public have been identified. This issue has been carried forward for site-specific analysis.			
Smoke grenades						
Other/equipment						

Table 3-46. Receptor and Effector Interactions for Socioeconomics and Environmental Justice, Cont'd

Proposed Action Effector	Resource Area Potentially Affected (Receptor)					
	Socioeconomics			Environmental Justice		
	Population	Economic Activity	Recreation and Tourism	Minority	Low-Income	Youth
	for site-specific analysis.					
Aircraft Operations	Potential for adverse impacts associated with disturbance from noise and safety concerns to the public have been identified. This issue has been carried forward for site-specific analysis.	No interaction. This issue has not been carried forward for detailed, site-specific analysis.		Potential for adverse impacts associated with disturbance from noise and safety concerns to the public have been identified. This issue has been carried forward for site-specific analysis.		
Amphibious Operations	No interaction. This issue has not been carried forward for site-specific analysis.	No interaction. This issue has not been carried forward for site-specific analysis.	No adverse impacts have been identified. Impacts to the public associated with disturbance from Amphibious Operations would be negligible and similar to ongoing boating activity in the area. This issue has not been carried forward for site-specific analysis.	No interaction. This issue has not been carried forward for site-specific analysis.		
Utilities	No interaction. This issue has not been carried forward for site-specific analysis.					

1 **3.11.4 Proposed Resource-Specific Mitigations**

- 2 Based on general impact analyses presented in Section [3.11](#), Proposed Resource-Specific
- 3 Mitigations would be the same as those identified in Sections [3.3](#) (*Noise*), [3.4](#) (*Safety*), and [3.10](#)
- 4 (*Land Use*).

1 **3.12 SOLID AND HAZARDOUS MATERIALS/WASTE**

2 This discusses the generation and management of solid and hazardous materials and wastes
3 associated with the activities under the Proposed Action.

4 **3.12.1 Impact Assessment Methodology**

5 The analyses focused on how and to what degree the Proposed Action would affect
6 hazardous materials management and solid waste generation and management. The debris
7 from range operations was calculated based on the types of ordnance used.

8 **3.12.1.1 Regulatory Drivers**

9 The following primary standards and regulations apply to solid and hazardous
10 materials/wastes as it relates to the Proposed Action:

- 11 • Resource Conservation and Recovery Act (RCRA), USC Title 40 CFR, Parts 239 to 282, 42
12 USC 6901 et seq: RCRA is the primary law governing the disposal of solid and
13 hazardous waste. RCRA established three distinct, yet interrelated, programs. First, the
14 solid waste program, under RCRA Subtitle D, encourages states to develop
15 comprehensive plans to manage nonhazardous industrial solid waste and municipal
16 solid waste, sets criteria for municipal solid waste landfills and other solid waste
17 disposal facilities, and prohibits the open dumping of solid waste. Second, the
18 hazardous waste program, under RCRA Subtitle C, establishes a system for controlling
19 hazardous waste from the time it is generated until its ultimate disposal—in effect,
20 from “cradle to grave.” Third, the underground storage tank (UST) program, under
21 RCRA Subtitle I, regulates USTs containing hazardous substances and petroleum
22 products.
- 23 • Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),
24 42 USC Chapter 103: CERCLA, commonly known as Superfund, created a tax on the
25 chemical and petroleum industries and provides broad federal authority to respond
26 directly to releases or threatened releases of hazardous substances that may endanger
27 public health or the environment.
- 28 • Florida Solid and Hazardous Waste Management Act, Florida Statutes 29 Chapter 403:
29 Requires that counties establish and operate solid waste disposal facilities and that
30 each county implement a recycling program to achieve reduction in the levels of solid
31 waste disposed.
- 32 • Florida Resource Recovery and Management Regulations, Florida Administrative Code
33 (FAC) 67.2: Establishes local resource recovery and management programs and
34 regulates the collection, transport, storage, separation, processing, recycling, and
35 disposal of solid wastes.

- 1 • AFI 32-7042, *Solid and Hazardous Waste Compliance*: Establishes municipal solid waste
2 management and compliance. In general, AFI 32-7042 establishes the requirements
3 for installations to have a solid waste management program that incorporates the
4 following: a solid waste management plan; procedures for handling, storage,
5 collection, and disposal of solid waste; record keeping and reporting; and pollution
6 prevention.
- 7 • AFI 32-7080, *Pollution Prevention Program* - Addresses source reduction, resource
8 recovery, and recycling of solid waste.
- 9 • Eglin AFB Instruction 32-7042, *Eglin AFB Hazardous Material Management Process* -
10 Establishes hazardous materials management practices for all Eglin AFB organizations
11 and tenants.
- 12 • Eglin AFB Instruction 32-7003, *Eglin AFB Hazardous Waste Management Plan* - Identifies
13 hazardous waste generation areas and addresses proper packaging, labeling, storage
14 and handling, record-keeping, spill contingency and response requirements, and
15 education.

16 **3.12.1.2 Assessment Method**

17 Potential impacts related to hazardous materials and hazardous wastes are analyzed for the
18 following effects.

- 19 • 1) Generation of waste types or quantities that cannot be accommodated by the
20 current management system. The analysis methodology identifies activities
21 associated with the Proposed Action and, using process knowledge or other available
22 data, predicts the type and quantity of wastes that would likely be generated from
23 these activities. These data are compared with current generation rates, waste types,
24 and capability for managing wastes to determine the resulting effects. It is assumed
25 that proposed activities would not result in the generation of hazardous wastes.
26 Additionally, it is assumed that metallic debris (e.g., brass cases) from training
27 operations would be recycled and, therefore, not disposed of as solid waste.
- 28 • 2) An increased likelihood of an uncontrolled release of hazardous materials that
29 could contaminate soil, surface water, groundwater, or air, from the release of
30 chemicals used in training activities. The analysis methodology first reviews the types
31 and quantities of hazardous materials that would be used (fuel, expendables, etc.) and
32 evaluates the potential for the release of these materials, and associated amounts, into
33 the environment. Potential impacts from chemical releases to specific media (i.e., soil,
34 water, air, biological resources) are discussed in each of those respective sections.

35 [Table 3-47](#) defines how the impact attributes of context, intensity, and duration are applied to
36 biological resource analyses.

1 **Table 3-47. Definitions of Impact Attributes for Solid and Hazardous Materials/Waste Resource**
 2 **Categories**

Attribute	Chemical Releases	Waste Generation
Contexts Analyzed		
Regional/population	County level, state park level, or management unit level effects; impacts to populations.	
Localized	Less than management area effects; impacts to individuals.	
Intensity (can be either adverse or beneficial)		
High	Substantive increase or decrease in chemical release that results in a relative decline or improvement in baseline chemical releases to soil, surface water, groundwater, or air. Examples include increases in existing releases and/or introduction of new releases at reportable quantity levels ¹ where there were none previously or discontinuation of actions currently resulting in reportable quantity releases.	Substantive increase or decrease in waste generation that results in a relative change in the waste management system. Examples may include increases in existing or introduction of new solid or nonacute and/or acute hazardous waste streams where there were none previously and that cannot be managed by the current waste management system without new or additional waste management procedures, or elimination of several solid or nonacute or acutely hazardous waste streams.
Medium	Moderate increase or decrease in chemical release that results in a relative decline or improvement in baseline chemical releases to soil, surface water, groundwater, or air. Examples include increases in existing releases and/or introduction of new releases under reportable quantity levels or a reduction in baseline chemical releases to quantities below reportable levels.	Moderate increase or decrease in waste generation that results in a relative change in the waste management system. Examples may include increases in existing or introduction of new, nonacute hazardous or solid waste streams where there were none previously and that can be accommodated by the existing management system with some procedural modification or reduction in quantities of baseline hazardous or solid waste generation.
Low	Slight increase or decrease in chemical release that results in no perceptible decline or improvement in baseline chemical releases to soil, surface water, groundwater, or air. Examples include small increases in existing releases that are currently under reportable quantity levels, or a small reduction in baseline chemical releases, neither of which result in noticeable impacts.	Slight increase or decrease in waste generation that results in no perceptible change in the waste management system. Examples may include small increases in existing nonacute hazardous or solid waste streams that can be accommodated by the existing management system with no procedural modification or reduction in quantities of baseline hazardous or solid waste generation, neither of which results in noticeable impacts.
Neutral	No chemical release or waste impacts.	
Duration		
Long term	Effect would likely endure for the life of the action.	
Medium term	Effect would likely last for a few months to a year.	
Short term	Effect would likely last for a few days to weeks.	

EPCRA = Emergency Planning and Community Right-to-Know Act

1. Reportable releases are those chemical releases in that exceed applicable reporting threshold quantities established under EPCRA.

3 **3.12.1.3 Impact Levels**

4 This section addresses the potential for the Proposed Action to pose adverse risks from
 5 chemical release, as well as the Air Force’s capability to manage these risks and manage
 6 solid/hazardous waste generation. The level of impact associated with solid and hazardous
 7 waste and the impact’s potential significance is determined by considering how Proposed

1 Action effectors could interact with solid/hazardous waste generation and management in
 2 terms of context, intensity, and duration as described in [Table 3-37](#). [Table 3-48](#) explains the
 3 impact level categories for solid and hazardous materials/waste analyzed in this EIS and
 4 identified in Chapters [4](#), [5](#), and [6](#).

5 **Table 3-48. Impact Level Categories for Solid and Hazardous Materials/Waste Resources**

Level of Impact	Solid & Hazardous Materials/Waste Receptors
Adverse	Adverse impacts may result from a chemical release of hazardous materials or the generation of solid/hazardous waste types or quantities, the level of impact directly related to the impact attributes described in Table 3-47 . Adverse impacts may be perceived as significant under high- to medium-intensity scenarios of any duration if proposed activities resulted in a high potential for uncontrolled chemical releases to the environment or the generation of wastes that could not be managed by the current system. Insignificant impacts may occur under medium-intensity scenarios of any duration and result in nonreportable chemical releases but chemical exposures to military personnel, the public, or the environment are adequately controlled by means of established procedures. For solid/hazardous waste, activities may result in the generation of large but manageable waste types or quantities requiring only some management adjustments.
Neutral/no effect	Activities do not result in a perceptible increase in chemical release potential, do not change baseline releases, or result in adverse chemical exposures. Solid/hazardous waste generation amounts may be reduced or may be similar to the baseline condition.

6 **3.12.2 General Emitter Activity Impact Assessment**

7 Based on the scope of action described in Chapter 2, emitter site use would not be expected
 8 to result in impacts to this resource. Operation of the emitters would not result in potential
 9 releases of hazardous chemicals or the generation of appreciable solid or hazardous wastes.

10 No hazardous materials or hazardous or petroleum wastes would be generated at most FFS
 11 sites or at the two FWC sites, because no industrial activities would occur at these sites. The
 12 only exceptions are the Molino, Youngstown, and White City sites. At these locations,
 13 personnel would perform limited maintenance of vehicles and equipment, primarily
 14 consisting of oil and fluid changes. Consequently, hazardous materials stored at these sites
 15 include small quantities (55-gallon containers or smaller) of lubricating oil, hydraulic fluid,
 16 antifreeze, solvents, and paints. All materials and wastes would be managed according to
 17 established FFS requirements. These requirements include the use of secondary containment
 18 and the availability of spill response equipment.

19 Emitter activity would be expected to result in neutral levels of solid waste (minimal
 20 improvements required, some solid waste from personnel). The primary hazardous material
 21 associated with this activity is POLs, used for fuel and lubrication of parts. Use of these items
 22 may result in generation of small amounts of POLs and associated waste, such as
 23 contaminated rags. Use of POLs, and disposal of associated wastes, would be conducted
 24 according to established procedures as described under Section [3.12.1.1](#), which would
 25 minimize the potential for associated spills. As a result, the Air Force anticipates no adverse
 26 impact to public health or safety or the human and natural environment or potential

1 violations of federal, state, or local regulations. Therefore, this issue has not been not carried
2 forward for site-specific analysis in Chapter 4.

3 **3.12.3 General Training Activity Impact Assessment**

4 Based on the scope of action described in Chapter 2, examples of potential debris generated
5 during training include:

- 6 • Shell casings, canisters from signal smokes, etc.
- 7 • Unexploded ordnance (UXO) (primarily inert items)
- 8 • Litter and refuse from daily mission activities, including ground troop movement

9 Most ground training on foot (dismounted maneuver) would involve movement without
10 leaving any evidence of troop presence. Impacts from litter or refuse are not anticipated if the
11 following mitigations are adhered to:

- 12 • Pack out debris and refuse packed in or properly dispose of litter (FAC 62-701).
- 13 • Remove and properly dispose of solid debris from blanks, GBSs, and smokes in
14 accordance with Eglin AFB operating procedures.
- 15 • Conduct post-mission surveys to ensure debris has been removed.

16 Based on the above, and the scope of action described in Chapter 2, the following proposed
17 activities are not discussed further under this resource area: utilities (which would have no
18 interaction with hazardous or solid materials and waste) and dismounted maneuver.

19 **Land Disturbance**

20 Impacts to solid and hazardous materials/waste may occur as a result of solid waste/debris
21 deposited on the surface of terrestrial or aquatic environments during land disturbance
22 activities. As discussed in Chapter 2, any land disturbance would be minimal in nature, and it
23 is not anticipated that land-clearing activities would generate a need for disposal of soil and
24 woody waste. This is based upon the assumption that soils generated would be used as fill
25 during construction projects and woody wastes would be used by the wood industry or
26 chipped and reused as mulch or compost on-site or in surrounding communities. Therefore,
27 these materials would not be expected to impact solid waste resources. As with emitter use,
28 utilization of POLs for equipment could result in chemical releases and hazardous waste
29 generation. However, use of POLs, and disposal of associated wastes, would be conducted
30 according to established procedures as described under Section 3.12.1.1, which would
31 minimize the potential for spills associated with these types of operations. As a result, the Air
32 Force anticipates no adverse impacts associated with chemical releases or generation of solid
33 or hazardous wastes from land disturbance activity.

34 **Ground Movement (Wheeled Vehicles), Aircraft Operations, and Amphibious Operations**

35 Impacts from these activities are associated with petroleum leaks or spills from the operation
36 or fueling of vehicles, aircraft, or watercraft.

37 Established refueling protocols and BMPs would be followed during vehicle operation or
38 refueling activities. These protocols include making spill response kits (pads and booms)
39 available on vehicles or during FARP/HGO operations. Personnel would also be trained on
40 how to respond to/clean up potential spills, which includes containing any spills with pads,

1 booms, etc. Post-spill activities may also include removing any contaminated soils and
 2 replacing these with clean fill. Within four hours of the spill event, a spill response form must
 3 be sent to the Eglin AFB Compliance Branch (96 CEG/CEIEC). Implementation of established
 4 vehicle operation and refueling protocols and BMPs would preclude the potential for any
 5 adverse environmental impacts.

6 UoEX

7 A primary impact to solid and hazardous materials/waste would be associated with a release
 8 of chemical materials to the environment. These materials encompass liquid, solid, or
 9 gaseous substances released to the environment as a result of mission activities and include
 10 expendables combustion by-products, fuel or oil leaks or spills, and untreated bilge release
 11 from watercraft.

12 To mitigate potential chemical releases, Eglin AFB has implemented a comprehensive
 13 Hazardous Material Management Process. Hazardous materials management is guided by
 14 AFI 32-7042 (U.S. Air Force, 2009). All Eglin AFB organizations and tenants are required to
 15 follow this plan. In addition, Eglin has implemented a Hazardous Waste Management Plan,
 16 Eglin AFB Instruction 32-7003. This plan identifies hazardous waste generation areas and
 17 addresses proper packaging, labeling, storage and handling, record keeping, spill
 18 contingency and response requirements, and education. Procedures and responsibilities for
 19 responding to a petroleum spill or other incident are also described in the Eglin AFB *Spill*
 20 *Prevention, Control, and Countermeasures (SPCC) Plan* (U.S. Air Force, 2005b).

21 Expendables training operations would be conducted twice per quarter during a 24-hour
 22 period and would involve 6 to 12 personnel. They would include movement from insertion
 23 points to objective sites and dismounted travel through training areas.

24 The Eglin AFB Interstitial Area Final Programmatic Environmental Assessment (U.S. Air Force,
 25 1998c) analyzed the environmental impact of increasing yearly ground troop movement in
 26 interstitial spaces from 55,800 troops per year (1997) to 167,500, equal to a 200 percent
 27 increase. No adverse environmental impacts associated with chemical releases or
 28 solid/hazardous waste were determined from the 200 percent increase in ground troops
 29 regarding debris and the use of blanks, smokes, and flares during ground troop training
 30 activities in Eglin AFB training areas.

31 The *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c)
 32 documented chemical releases from the UoEX of the same quantity and types as are
 33 associated with the current Proposed Action. [Table 3-49](#) summarizes the associated annual
 34 release of chemical constituents from the use of these expendables.

35 **Table 3-49. Expendables-Related Residue**

Chemical	Annual Quantity Generated (pounds)
Antimony	5
Barium	8
Chromium	3
Hydrochloric acid	79
Lead	8

Source: U.S. Air Force, 2009

1 The chemical load from all expendables, as summarized in the table, would be distributed
2 over all training areas. Therefore, the overall concentration of any chemical at any given
3 location would be minute. Consequently, no significant adverse impacts are associated with
4 the release of chemicals from the proposed UoEX.

5 Releases to the environment from expendables used in proficiency and qualification training
6 require reporting to the USEPA under the Emergency Planning and Community Right-to-
7 Know Act (EPCRA) Toxics Release Inventory (TRI) program. Training is subject to a TRI
8 reporting threshold of 10,000 pounds per year for most common chemicals, with lower
9 reporting thresholds for chemicals classified as persistent bioaccumulative toxic. These
10 chemicals include mercury, with a reporting threshold of 10 pounds, and lead, with a
11 threshold of 100 pounds. In cases when a threshold is exceeded, the installation must report
12 on a "Form R" report to the USEPA the quantity of munitions-related waste released to the
13 environment or recovered and recycled. Eglin AFB has procedures to comply with TRI
14 reporting requirements and would track expendables use associated with the proposed
15 activities. Potential impacts could result if proposed training activities would result in
16 reporting thresholds being exceeded at Eglin AFB for any new chemicals. Based on the
17 quantity of chemicals that would be released as part of proposed activities, no new TRI
18 thresholds would be exceeded and no additional TRI reporting would be required by Eglin
19 AFB.

20 Additionally, troops would be required to recover shell casings and other expendable by-
21 products (e.g., GBS canisters) from the training sites to the extent practicable. While it would
22 not be feasible to collect every casing or other expendable by-product, the amount that may
23 be missed or left behind would be minimal. The *Interstitial Area Range Final Environmental*
24 *Assessment Revision 2* (U.S. Air Force, 2013c) addresses impacts under similar circumstances
25 and found that there would be no significant impacts. Consequently, given the amount of
26 expendables would be lower at the state forests than that represented in analyses for Eglin
27 AFB, the Air Force expects that the minimal amount of expendable by-products that may be
28 missed as part of troop recovery processes at the state forests would result in minimal
29 impacts to the environment.

30 **3.12.3.1 General Training Activity Impact Assessment Summary**

31 [Table 3-50](#) summarizes potential interactions between Proposed Action effectors and
32 resource effectors. Activities shaded in green have little potential to impact public health or
33 safety or the human and natural environment or do not result in potential violations of
34 federal, state, or local regulations. Therefore, these activities are not carried forward for
35 detailed analysis in Chapters [5](#) and [6](#).

1
2

Table 3-50. Receptor and Effector Interactions for Solid and Hazardous Materials/Waste Resources

Proposed Action Effector	Hazardous/Solid Materials/Waste Receptor	
	Chemical Release	Waste Generation
Land Disturbance		
Land development	No effect associated with chemical releases. Land development activities would be minimal and result in minor potential for petroleum leaks/releases from construction equipment during use and fueling; these are avoided through implementation of SOPs/BMPs discussed previously. This issue has not been carried forward for site-specific analysis.	No effect associated with waste generation. Land development activities would be minimal and result in relative waste amounts. Any wastes would be recycled on site. This issue has not been carried forward for site-specific analysis.
Point impact	These activities do not involve the use of hazardous materials nor would they result in the generation of hazardous waste. There may be small amounts of solid waste produced by personnel during these activities. However, the Air Force does not expect these activities to result in adverse impacts, due to the small amounts potentially generated and the requirement for personnel to pick up any litter generated. This issue has not been carried forward for site-specific analysis.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	There is a minor potential for petroleum leaks/releases from vehicles during operation and fueling. However, this potential is minimized through implementation of SOPs/BMPs discussed previously. This issue has not been carried forward for site-specific analysis.	Little potential for impacts; any wastes generated (such as rags or oil cans) would be collected and disposed of according to previously described SOPs/BMPs. This issue has not been carried forward for site-specific analysis.
Dismounted maneuver	This activity would be expected to have no effect on the safety environment for military personnel or the general public. This issue has not been carried forward for site-specific analysis.	This activity has potential for litter and refuse from daily mission activities. However, as previously discussed, personnel would be required to pick up and litter and "leave no trace." As a result, the Air Force anticipates no adverse waste impacts. This issue has not been carried forward for site-specific analysis.
Use of Expendables		
Blanks/GBS	There is a negligible potential for impacts. While release of hazardous constituents during utilization (e.g., detonation process) would occur use would be infrequent and distributed over a wide area. As discussed in the Eglin Interstitial Range Environmental Assessment, use of these items at much higher quantities and frequencies was found to have no adverse impact. Releases would not result in reportable quantities. This issue has not been carried forward for site-specific analysis.	Utilization of these expendables would result in generation of metallic (e.g., brass casings) and plastic debris. However, as discussed previously, personnel would be required to collect this debris post training. As a result, the Air Force anticipates no adverse impact. This issue has not been carried forward for site-specific analysis.
Smoke grenades		
Other/equipment	Use of other equipment (generators, etc.) has a minor potential for petroleum leaks/releases during operation and fueling, as well as generation of wastes such as rags or oil cans. However, these are avoided through implementation of SOPs/BMPs discussed previously. Consequently, the Air Force expects no adverse impacts. This issue has not been carried forward for site-specific analysis.	
Aircraft Operations	There is a minor potential for petroleum leaks/releases from aircraft and boats during operation and fueling. However, this potential is minimized through implementation of SOPs/BMPs discussed previously. This issue has not been carried forward for site-specific analysis.	
Amphibious Operations		
Utilities	This activity would not result in chemical releases or wastes and would be expected to have no effect. This issue has not been carried forward for site-specific analysis.	

BMP = best management practice; SOP = standard operating procedure

1 **3.12.4 Proposed Resource-Specific Mitigations**

2 Based on general impact analyses presented in Section [3.12](#), no Resource-Specific Mitigations
3 have been identified. Implementation of General Operational Constraints described in
4 Section [2.5](#) would serve to minimize the potential for any adverse impacts.

5 **3.13 INFRASTRUCTURE AND TRANSPORTATION**

6 “Infrastructure” refers to the system of public works, such as utilities and transportation that
7 provides the underlying framework for a community. Utilities typically consist of the services
8 and facilities that supply electricity, potable water, wastewater treatment, and natural gas.
9 Transportation infrastructure includes the public roadway network, public transportation
10 systems, airports, railroads, pedestrian/bicycle facilities and waterborne transportation
11 required for the movement of people, materials, and goods. Each of these utility and
12 transportation resource components is referred to as a “receptor.”

13 **3.13.1 Impact Assessment Methodology**

14 The impact assessment for infrastructure evaluates the potential impacts of the Proposed
15 Action on utilities and transportation resources. Impacts to these resources are evaluated
16 according to type, context, intensity, and duration (as described in Section [3.1](#)). Together,
17 these attributes define the potential significance of the impacts.

18 **3.13.1.1 Regulatory Drivers**

19 There are no applicable regulatory drivers for infrastructure and transportation resources.

20 **3.13.1.2 Assessment Method**

21 Impacts to utilities and transportation were assessed with respect to the potential for
22 disruption, degradation, or improvement of existing utility systems and roadways, changes in
23 demand for energy or water resources, deterioration or improvement of existing levels of
24 service, and changes in existing levels of utility and transportation safety. Impacts may arise
25 from physical changes to utility corridors, construction activity, change in demand for services
26 from changes in personnel, and increased utilization of existing roadways. [Table 3-51](#) defines
27 how the impact attributes of context, intensity, and duration are applied to utility and
28 transportation resource analyses.

1

Table 3-51. Definitions of Impact Attributes for Infrastructure

Attribute	Utilities	Transportation
Contexts Analyzed		
Regional/population	Large-scale power generation plants and interstate power or natural gas distribution systems, water and wastewater treatment systems that serve the region or large counties.	Interstate, U.S., or state highways.
Localized	Small individual or municipal utilities and infrastructure (e.g., city water or wastewater treatment plant, individual water wells and septic systems, local power, water, sewer, and gas lines).	County or local roads and streets, road network within BRSF or THSF.
Intensity (can be either adverse or beneficial)		
High	Substantive change in average and peak utility use associated with the Proposed Action. Major new utility construction and/or upgrades to existing utility infrastructure.	Substantive change in traffic volume and/or major new road construction/improvements that have major effects and changes on the operational characteristics, level of service, circulation patterns, and safety of the affected roadways.
Medium	Moderate change in utility use and demand. Minor new utility construction and/or upgrades to existing utility infrastructure.	Moderate change in traffic volume and/or new road construction/improvements that have a limited effect on the operational characteristics, level of service, circulation patterns, and safety of the affected roadways. New road construction/improvements
Low	Negligible change in utility use and demand that could be easily accommodated by existing systems. Existing utility connections could be upgraded or added, but construction of new utility infrastructure would not occur.	Negligible change in traffic volume and/or small road construction/improvement projects that have little effect on the operational characteristics, level of service, circulation patterns, and safety of the affected roadways.
Neutral	No apparent change in operational condition of the resource.	
Duration		
Long term	Effects would be permanent or endure for the operational life of the action or until improvements could be made or new infrastructure constructed to accommodate increased use and demand.	
Medium	Depending on seasonal periods of use and demand, effects would likely last for a few months. New construction and improvements could last for a few months to a year.	
Short term	Effects would likely last for a few days to a week only during times of activity associated with the action.	

BRSF = Blackwater River State Forest; THSF = Tate's Hell State Forest

2 **3.13.1.3 Impact Levels**

3 The level of impact associated with infrastructure and the impact's potential significance is
 4 determined by considering how Proposed Action effectors could interact with utilities and
 5 transportation resources in terms of context, intensity, and duration as described in
 6 [Table 3-51](#). [Table 3-52](#) explains the impact level categories for utilities and transportation
 7 resources analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

1

Table 3-52. Impact Level Categories for Infrastructure

Level of Impact	Utilities	Transportation
Adverse	<p>Adverse utility impacts may result in changes to existing utility infrastructure, use, or demand, the level of impact directly related to the impact attributes described in Table 3-51. Adverse impacts may be perceived as significant under high-intensity scenarios of long duration where an increase in average and peak utility use and demand is beyond the capacity of existing utility infrastructure. Major system upgrades that are beyond those projected by the utility system in their capital improvements plans could be necessary to maintain existing level of service. Insignificant impacts may occur under medium-intensity scenarios of any duration and result in:</p> <ul style="list-style-type: none"> • A violation of a permit condition or contract with a utility provider. • Deterioration or interruption of existing utility services. • Physical changes to utility plants and corridors from upgrades and construction of new infrastructure. <p>Moderate increases in utility use and demand could be met by existing utility systems. However, future use/demand could be limited due to the lack of excess capacity unless upgrades or new infrastructure are added.</p>	<p>Adverse transportation impacts may result in traffic volume and/or new road construction/improvements, the level of impact directly related to the impact attributes described in Table 3-51. Adverse impacts may be perceived as significant under high-intensity scenarios of long duration resulting in:</p> <ul style="list-style-type: none"> • Increased traffic volumes at or above a roadway's full design capacity causing a reduction in level of service and major congestion and traffic delays. • Accident rate increases greater than the average range of accidents on similar roadways. • Major deterioration of roadway surfaces beyond normal conditions or wear rates. • The need for major roadway construction and/or upgrades beyond those projected and funded by federal, state, or local agencies. <p>Insignificant impacts may occur under medium- to low-intensity scenarios of any duration negatively affecting traffic congestion and accident rates during peak travel times but not necessarily leading to a change in level of service. Additional traffic might also contribute to increased roadway deterioration. New roadway construction/improvements could cause temporary traffic delays and temporary road closures until activities are completed.</p>
Neutral/no effect	<p>Activities do not require utility upgrades or new infrastructure because utility use/demand is unchanged or remains close to baseline conditions.</p>	<p>Activities have no effect on circulation, traffic congestion, and accident rates and existing transportation resources are unchanged or unaffected from normal conditions.</p>

2 **3.13.2 General Emitter Activity Impact Assessment**

3 Based on the scope of action described in Chapter 2, emitter site use would not be expected
 4 to result in impacts to utilities or transportation resources. All of the proposed emitter
 5 locations are improved or semi-improved sites and, except for FWC-2, have on-site electrical
 6 power available. Water and telephone service is available at all of the locations except FWC-1
 7 and FWC-2. Four of the locations (EAFB-1, FFS-5, FFS-6, and FFS-7) also have fiber optic
 8 service available. Power generation for the different types of emitters would be provided
 9 either by generator or connection to the existing electrical system. Water would either be
 10 supplied through the available on-site sources or could be brought in as needed. If latrines
 11 are not available on-site, portable toilets could be utilized during training activities. Transport
 12 of the various emitters to the emitter sites would only require occasional trips utilizing a small
 13 number of transport and support vehicles and would not adversely impact any of the

1 roadways that would be used. Based on the context, intensity, and duration of emitter site
2 use, the Air Force has not identified any adverse impacts to infrastructure associated with the
3 Proposed Action. Therefore, this issue area is not carried forward for site-specific analysis in
4 Chapter [4](#).

5 **3.13.3 General Training Activity Impact Assessment**

6 Based on the scope of action described in Chapter [2](#), all training activities except for
7 establishment of HLZs/DZs, UoEX, LLHI/Es, AO, Natural Resource Consumption, and OHO
8 would have at least some interaction with utility or transportation resources.

9 Use of utilities would only occur at BRSF associated with use of the hardened camp sites. Use
10 at these locations would be intermittent, and would not be expected to result in any
11 additional burden on utility providers because these sites have been used in the past more
12 frequently with no issues. With regards to transportation resources, small convoys (5–10
13 vehicles) may be used to transport troops to/from the training sites; this would not be
14 expected to result in any transportation issues. There would be occasional, temporary
15 closures of specific roadways associated with the FWALS and during BD. These closures
16 would be road-segment specific and only during training operations. These closures would
17 not result in restricted access to forest areas because there are multiple roadways available on
18 each forest to allow “drive-arounds.” As part of general operating constraints, boating activity
19 associated with AO would require avoidance and interaction with recreational boaters. Based
20 on the above the Air Force does not anticipate adverse impacts associated with
21 transportation or infrastructure. Consequently, this issue area has not been carried forward
22 for detailed analysis in Chapters [5](#) (BRSF) and [6](#) (THSF).

23 **3.13.3.1 General Training Activity Impact Assessment Summary**

24 [Table 3-53](#) identifies potential interactions between Proposed Action effectors and
25 infrastructure receptors; no potential for adverse impacts have been identified. Activities
26 shaded in green have little potential to impact public health or safety or the human and
27 natural environment or do not result in potential violations of federal, state, or local
28 regulations. Therefore, these activities are not carried forward for detailed analysis in
29 Chapters [5](#) and [6](#).

1

Table 3-53. Receptor and Effector Interactions for Infrastructure

Proposed Action Effector	Infrastructure Resource Area Potentially Affected (Receptor)	
	Utilities	Transportation
Land Disturbance		
Land development	No adverse impacts have been identified. Potential interaction with existing aboveground (e.g., telephone poles, electrical lines) and underground (e.g., water, sewer, and gas lines) utilities would be minimal because any land development activities would be conducted in coordination with the FFS to identify any utility lines for avoidance. This issue has not been carried forward for site-specific analysis.	No adverse impacts have been identified. Temporary closure of affected forest service roads for training activity improvements and maintenance would be an infrequent occurrence on up to four roadway segments, and is expected to have a negligible impact on use of forest roads. This issue has not been carried forward for site-specific analysis.
Point impacts	No interaction with utilities or transportation resources. These issues have not been carried forward for site-specific analysis.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	No interaction with utilities or transportation resources. This issue has not been carried forward for site-specific analysis.	No adverse impacts have been identified. Intermittent movement of small convoys along federal, state, and local roadways would not impact roadway traffic. Temporary closure of affected roads for training activities (i.e., Blackout Driving) would be infrequent, would only occur at night, and would have a negligible impact on use of forest roads. This issue has not been carried forward for site-specific analysis.
Dismounted maneuver	No interaction with utilities or transportation resources. This issue has not been carried forward for site-specific analysis.	
Use of Expendables		
Blanks/GBS	No interaction with utilities or transportation resources. This issue has not been carried forward for site-specific analysis.	
Smoke grenades		
Other/equipment	No interaction with utilities.	No adverse impacts have been identified. Temporary closure of affected forest roads during training activities (e.g., Emplacement of Obstacles) would be an infrequent occurrence on roadway segments, and is expected to have a negligible impact on use of forest roads. This issue has not been carried forward for site-specific analysis.
Aircraft Operations	No interaction with utilities. This issue has not been carried forward for site-specific analysis.	No adverse impacts have been identified. Temporary closure of affected forest service roads for training activities (e.g., Light Aviation Proficiency Training) would be an infrequent occurrence on up to four roadway segments, and is expected to have a negligible impact on use of forest roads. This issue has not been carried forward for site-specific analysis.

Table 3-53. Receptor and Effector Interactions for Infrastructure, Cont'd

Proposed Action Effector	Infrastructure Resource Area Potentially Affected (Receptor)	
	Utilities	Transportation
Amphibious Operations	No interaction with utilities or transportation resources. This issue has not been carried forward for site-specific analysis.	
Utilities	No adverse impacts have been identified. Utilities (electricity, potable water) at the BRSF STOP Camp and Santa Rosa Youth Academy site would be used to support the Hardened Camp Site Use activity. Use at these locations would be intermittent, and would not be expected to result in any additional burden on utility providers because these sites have been used in the past more frequently with no issues. No interaction with utilities at THSF. This issue has not been carried forward for site-specific analysis.	No interaction with transportation. This issue has not been carried forward for site-specific analysis.

BRSF = Blackwater River State Forest; GBS = ground-burst simulator; STOP = Short-Term Offender Program; THSF = Tate's Hell State Forest

1 **3.13.4 Proposed Resource-Specific Mitigations**

2 Based on general impact analyses presented in Section [3.13](#), no Resource-Specific Mitigations
 3 have been identified for infrastructure and transportation. Implementation of General
 4 Operational Constraints described in Section [2.5](#) would serve to minimize the potential for
 5 any adverse impacts.

6 **3.14 PROPOSED ACTION AFFECTED RESOURCE SUMMARY**

7 [Table 3-54](#) provides a summary of resources potentially adversely affected by the Proposed
 8 Action, based on analyses provided in Sections [3.2–3.13](#). A “dot” indicates an interaction
 9 between a resource and an effector. Resource areas and interactive effectors identified in
 10 yellow show the potential for adverse impacts to site-specific resources and have been
 11 carried forward for site-specific analyses in Chapters [4](#), [5](#), and [6](#) to determine the associated
 12 level of impact.

13 Resource areas and interactive effectors identified in green have not been carried forward for
 14 site-specific analysis in Chapters [4](#), [5](#), and/or [6](#) because (1) there is no potential interaction
 15 between the Proposed Action and the resource/issue area, (2) general analyses provided in
 16 Sections [3.2–3.13](#) have determined that there is no potential for violation of federal, state, or
 17 local regulation and that any impacts to public health and safety and the human and natural
 18 environment are either neutral or have no adverse effect despite the site-specific nature of
 19 the resource, or (3) incorporation of identified General Operational Constraints (Section [2.5](#))
 20 and/or Proposed Resource-Specific Mitigations (indicated in respective resource-area
 21 discussions) as part of the Proposed Action precludes adverse impacts.

1

Table 3-54. Proposed Action Affected Resource Summary

Proposed Action Effectors	Potentially Adversely Affected Resources											
	Airspace (3.2)	Noise (3.3)	Safety (3.4)	Air Quality (3.5)	Earth Resources (3.6)	Water Resources (3.7)	Biological Resources (3.8)	Cultural Resources (3.9)	Land Use (3.10)	Socioeconomics/Environmental Justice (3.11)	Haz/Solid Materials & Waste (3.12)	Infrastructure (3.13)
Land Disturbance												
Land development	●	●	●	●	●	●	●	●	●	●	●	●
Point impact					●	●	●	●				
Incidental surface disturbance					●	●	●	●				
Consumption						●	●					
Ground Movement												
Wheeled vehicles		●	●	●	●	●	●	●	●	●	●	●
Dismounted movement					●	●	●	●	●	●	●	●
Use of Expendables/Equipment												
Blanks/GBS		●	●	●	●	●	●		●	●	●	
Smoke grenades			●	●	●	●	●		●	●	●	
Other/equipment		●	●	●	●	●	●		●	●	●	
Aircraft Operations	●	●	●	●	●		●	●	●	●	●	
Amphibious Operations		●	●	●	●	●	●	●	●	●	●	
Electromagnetic Radiation			●				●		●	●		
Utilities												●

GBS = ground burst simulator

2 **3.14.1 Proposed Resource-Specific Mitigations**

3 Based on the scope of activities associated with the Proposed Action, the inherent General
 4 Operational Constraints identified in Section 2.5, and related impact analyses detailed in
 5 Chapter 3, there are no identified Resource-Specific Mitigation impact minimization
 6 procedures necessary for the following resource areas: solid/hazardous materials and waste,
 7 and infrastructure and transportation.

8 Impact analysis of the Proposed Action has identified the following Proposed Resource-
 9 Specific Mitigations that would be implemented, in addition to General Operational
 10 Constraints in Section 2.5, to further minimize or avoid adverse impacts – in most cases
 11 impacts would be minimized such that impact level categories would be reduced from
 12 “adverse” (yellow) to “neutral” or “no effect” (green).

13 **Both Forests**

14 **Airspace Management**

15 A coordination process would be established by which the Air Force would work with FFS
 16 POCs prior to any mission to ensure that FFS operations and recreational aviation activities
 17 would not be negatively impacted by GLI training.

1 **Noise**

- 2 • Aircraft would not operate below 500 feet AGL except while engaged in approaches
3 to, departures from, or training at designated HLZ/DZ, OHO locations, or FWALS.
- 4 • HLZ/DZs would be sited at not less than 2,200 feet from known noise-sensitive
5 locations. Known noise-sensitive locations include campgrounds and privately owned
6 parcels with at least one residential structure.
- 7 • Maneuvers near the HLZ/DZ (i.e., initial approach, departure, circling and pattern work
8 at less than 500 feet AGL) would not be conducted at distances less than 200 feet from
9 known noise-sensitive locations.
- 10 • OHO locations would not be located within 2,200 feet of known noise-sensitive
11 locations.
- 12 • The full spectrum of HLZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be
13 permitted at FWALS that are remote from all known noise-sensitive locations (i.e.,
14 FWALS in TA-1, the northern half of Munson Airstrip, and all FWALS in THSF). Only
15 LAPT would be allowed at the FWALS in TA-9.
- 16 • New FWALS would not be located within 9,300 feet of known noise-sensitive locations
17 if they would also be approved for the full spectrum of HLZ/DZ uses.

18 **Earth Resources**

- 19 • Clear zones for FWALS would be cleared as part of normal forestry operations; the Air
20 Force would not clear any areas in support of roadway use for FWALS. This limits the
21 potential for adverse impacts associated with soil erosion, and eliminates the need for
22 NPDES or USACE Section 404 permitting.
- 23 • FWALS within poorly suited areas (see Section [3.6.3](#)) can only be used on existing
24 roadways that do not require land disturbance outside the existing road bed or right-
25 of-way. This limits the potential for adverse impacts associated with soil erosion, and
26 minimizes the need for excessive maintenance.
- 27 • Conduct site fingerprinting of each proposed FWALS location to collect the data
28 necessary to develop and implement FWALS project plans. Site fingerprinting is a data
29 collection, ground-truthing, and reporting process designed to gather and analyze the
30 field data necessary to plan, design, and construct FWALS to fully support the
31 proposed military aircraft training activities. Site data collection tools and protocols
32 are used during field visits to gather critical roadway and affected area measurements,
33 photopoint records, and soil samples. Based on validated field features and
34 conditions, determinations can then be made as to site suitability and engineering
35 requirements. As needed, site project plans could then be developed to meet site
36 construction and operational needs.
- 37 • Utilize sites that are best suited to the intended activity and avoid areas with known
38 constraints or limitations.
- 39 • Temporally and spatially disperse FWALS and HLZ/DZ training to minimize repetitive
40 use impacts to landing zone surface conditions and maximize life cycles. Utilize
41 mission logistics information to plan training events that avoid, to the degree possible,
42 FWALS used during the previous year and HLZ/DZ areas used during the previous two

- 1 years. A rest period would promote vegetative growth and allow disturbed areas to
2 recover.
- 3 • Construct and maintain an FWALS drainage system that collects and discharges
4 stormwater runoff in a non-erosive manner.
 - 5 • Inspect FWALS landing zones following each training mission. Coordinate immediate
6 repairs of damaged areas with the L.I.T.
 - 7 • Avoid clear zone maintenance during wet soil conditions. All soils are highly sensitive
8 to mechanical compaction or rutting damage when wet.
 - 9 • As needed, install BMPs to minimize soil disturbances (FDACS, 2008; USACOE, 2004;
10 USACOE, 2008). For clear zone sites with extreme rutting damage, physically amend
11 damaged soils with tillage equipment after the soils have dried. Depending on extent
12 of damage, soil structure amendments could be made with hand tools or motorized
13 tillage equipment. Areas may also need to be reseeded to native species to reduce
14 bare ground and encourage the establishment of soil protecting ground cover.
 - 15 • Avoid HLZ/DZ areas with highly and potentially highly erodible soils and hydric soils.
16 Soil erosion potentials increase with increasing soil erodibility and wet soil are highly
17 sensitive to damage by compaction and rutting.
 - 18 • Maintain at least a 100 foot exclusion buffer around sensitive steephead slopes and
19 closed depression subsidence areas to prevent accelerated soil erosion of slopes and
20 wet soil rutting.
 - 21 • As necessary, install temporary metal landing mats for HLZ/DZ landing training
22 activities conducted in wet areas during poor weather conditions. Mats can reduce
23 potentials for soil damage and provide stable platforms aircraft landings, materials
24 and personnel loading and unloading, and temporary storage.
 - 25 • To the degree possible, utilize established walking trails or designated roads during
26 cross county dismounted maneuvers.
 - 27 • Avoid cross county maneuvers through steephead locations. The steep to very steep
28 slopes of these geologic features are highly prone to accelerated rates of erosion if
29 disturbed.
 - 30 • Avoid the use of borrow pits for temporary campsites. For some pits, additional
31 surface disturbances could increase soil erosion rates or affect the stability of early-
32 stage pit reclamation.
 - 33 • Avoid establishing temporary camps within or in proximity to steepheads and closed
34 depression areas. These sites may be sensitive to increases in stormwater runoff of
35 disturbances associated with camp activities. An exclusion zone of at least 100 feet is
36 recommended.
 - 37 • Avoid sensitive streambank areas that are overheightened and oversteepened and/or
38 areas exhibiting bank scour and mass failure features.
 - 39 • To the degree possible, avoid the repetitive use of the same egress and ingress
40 locations within the same year for AO.

- 1 • For sites where vegetation damage could result in loss of plant cover, reseed with
2 native species to encourage the reestablishment of vegetative cover.

3 **Water Resources**

- 4 • Use only FFS-approved, designated vehicle water crossings in “Good” or “Fair”
5 condition. Report any damaged water crossings identified in the field to the L.I.T.
- 6 • If off-road vehicle use is required for any reason the respective FFS Management Office
7 would need to be consulted prior to occurrence, and no vehicles would be allowed
8 within 100 feet of a surface water body or wetland as specified by EABFI 13-212.
- 9 • To minimize localized damage potential from foraging and dismounted troop
10 movements, the size of troop units will be kept to small manageable numbers. Troop
11 use would be rotated within and among TAs to prevent concentration of activities in
12 particular locations. Implementation of this mitigation would allow water resources to
13 recover from extended use after intensive training activities.
- 14 • Roads, trails, and stream/wetland crossings would be inspected before and after each
15 training mission to identify maintenance issues that could cause problems if not
16 repaired. Training activities would be shifted or redirected if conditions of roads and
17 stream and wetland crossings require repair or other measures to prevent erosion
18 from impacting surface waters and wetlands. The FFS will be notified of any identified
19 issues. Wheeled vehicle training would only occur on crossings rated as good or fair
20 condition; no wheeled vehicle training would occur at crossings rated Poor until these
21 crossing are approved by the FFS.
- 22 • AO would utilize designated ingress/egress locations as determined by the GLI Liaison
23 and the FFS. To the extent possible AO should use established, hardened boat ramps
24 for ingress/egress of amphibious craft. If ingress/egress must utilize natural habitat in
25 wetlands, care should be taken to prevent destruction of wetland vegetation or other
26 activities that might cause shoreline erosion. Ingress/egress points for both personnel
27 and watercraft should be rotated to the extent possible to allow sites time to recover
28 from AO.

4. EMITTER SITES AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter provides the affected environment and environmental impact analysis for use of emitter sites as described in Section [2.3.1](#). As discussed in Chapter 3, Section [3.14](#), *Proposed Action Affected Resource Summary*, some resource areas would experience no interaction with this activity, or general impact analyses in Sections [3.2](#) through [3.13](#) have shown that there would be negligible or no impacts to a specified resource area, despite the site-specific nature of the resources. This is noted in each applicable resource area's section. Overall, impact analyses for EMR account for any applicable General Operational Constraints identified in Section [2.5](#). At the end of this chapter, Section [4.14](#) summarizes the emitter site environmental analysis and any associated Proposed Resource-Specific Mitigations required to minimize or avoid adverse impacts.

4.2 AIRSPACE MANAGEMENT AND USE

As discussed in Chapter 3 (Section [3.2.2](#)), emitter site use would not be expected to result in impacts to airspace management. As a result, this resource area is not discussed in further detail in this chapter.

4.3 NOISE

As discussed in Chapter 3 (Section [3.2.2](#)), emitter site use would not be expected to result in adverse noise impacts associated with public health and safety or the human and natural environment. Construction noise impacts would be temporary and localized. Operations of a generator at emitter site FWC-2 would result in noise levels of approximately 49 dB at the nearest residence. These operations would be in compliance with all federal, state, and local regulations. Consequently, this resource area is not discussed further in this chapter.

4.4 SAFETY

4.4.1 Affected Environment

The affected environment for safety as it relates to proposed activities comprises the policies and procedures currently in place at Eglin AFB, previously discussed in Sections [3.4.2](#) and [3.4.3](#).

Because of the strict review and control of activities employing the use of EMR emitters, there is little, if any, EMR exposure to personnel that might cause injury to or that may result in explosion or fire hazards.

1 The Blackwater Forestry Center (BFC) and the Tallahassee Forestry Center (TFC) of the FFS
 2 have primary responsibility for BRSF and THSF, respectively. TFC and BFC are responsible for
 3 prevention, detection, and suppression of wildfires, as well as responding to emergencies,
 4 such as accidents. BFC encompasses Escambia, Santa Rosa, and Okaloosa Counties, while TFC
 5 encompasses Leon, Gadsden, Liberty, Wakulla, Jefferson, and Franklin Counties. Both BFC
 6 and TFC have cooperative agreements with local fire and police departments, and also call on
 7 the Florida Highway Patrol and Florida Department of Transportation to provide assistance as
 8 needed. For more information on the capabilities of BFC and TFC, please refer to Sections [5.4](#)
 9 and [6.4](#), respectively.

10 **4.4.2 Environmental Consequences**

11 Because of the strict review and control of activities employing the use of EMR emitters on the
 12 Eglin Reservation, there is little, if any, EMR exposure to military personnel engaged in test
 13 range activities. There is also little chance of fuel vapor situations/EEDs that might cause
 14 injury to personnel if ignited or detonated by exposure to sufficient EMR field strengths.

15 Emitter site use would not be expected to result in significant adverse safety impacts to the
 16 public. Only the JTE system could emit EMR. This system has an SHD of 400 feet from
 17 habitable buildings or recreational sites and 268.7 feet from EED storage and 198.3 feet from
 18 fuel storage areas. [Table 4-1](#) lists the potential acceptable JTE emitter sites based on the SHD
 19 of 400 feet, which would result in no safety impacts to the population. All sites would be
 20 acceptable for radar and telemetry units.

21 **Table 4-1. Potential Locations for JTE Systems Based on SHD**

Emitter Site	Owner	Structures Within 400-foot Buffer ¹	Description of Land ²	Acceptable Location for the JTE System
EAFB-1	Eglin	Structures exist; not residential	Barren land	Potential
FFS-1	FFS	Yes	Low-density residential	No
FFS-2	FFS	Yes	Low-density residential	No
FFS-3	FFS	Potential	Medium-density residential	No
FFS-4	FFS	Yes	Low-density residential	No
FFS-5	FFS	Structures exist; not residential	Education/institutional	Potential
FFS-6	FFS	Structures exist; not residential	Education/institutional	Potential
FFS-7	FFS	Structures exist; not residential	Commercial services	Potential
FFS-8	FFS	None	Low-density residential	Yes
FFS-9	FFS	None	Wetland forest mix	Yes
FWC-1	FWC	None	Upland forest	Yes
FWC-2	FWC	None	Upland forest	Yes

FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission; JTE = joint threat emitter;
 SHD = safety hazard distance

1. Based on evaluation of satellite imagery
2. FDEP, 2007a

22 Additional guidance on protecting personnel from electromagnetic fields, including safety
 23 training and personal protection equipment, is provided in Defense Instruction 6055.11,
 24 *Protection Personnel from Electromagnetic Fields* (DoD, 2009). Since radars would be placed to
 25 avoid populated areas, and the sites would be fenced or have other security measures to
 26 prevent unauthorized personnel from entering the safety hazard area, no significant impacts

to the general public would be expected. Air Force personnel, both military and civilian, working directly with the JTE equipment would adhere to the safety guidelines provided in the 2008 SSHA and Defense Instruction 6055.11. Therefore, no significant impacts to military personnel would be expected under the Proposed Action.

Based on [Table 4-1](#), the JTE system would not be located at the following emitter sites due to the proximity of residential structures within the SHD: FFS-1, FFS-2, FFS-3 and FFS-4. As a result, there would be no adverse impacts associated with emitter use at these locations.

Sites EAFB-1, FFS-5, FFS-6, and FFS-7 currently have structures within or near proposed SHDs; however, these structures are not residential. These sites would need to be evaluated prior to JTE use to ensure no persons are within these structures that may be at risk of EMR exposure. Provided this mitigation is implemented, the potential for adverse impacts would be avoided.

4.4.3 Impact Summary

[Table 3-15](#) identifies the context, intensity, and duration factors utilized in safety analysis; based on these factors the Air Force has identified the potential for insignificant adverse impacts to public health and safety at four proposed emitter sites associated with the JTE SHD and proximity to inhabited buildings. This impact can be mitigated through actions described in Section 4.4.4. [Table 4-2](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

Table 4-2. Impact Summary for Safety – Emitters

Receptor	Emitter Site											
	EAFB-1	FFS-1 ^a	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1	FWC-2
Population	b					b	b	b				

a. Assumes no joint threat emitter locations.

b. Adverse impacts can be mitigated as described in Section 4.4.4.

4.4.4 Proposed Resource-Specific Mitigations

Implementation of the following mitigations would preclude any adverse impacts, reducing impact significance as listed in [Table 4-2](#) from adverse (yellow) to neutral or no effect (green).

- Sites EAFB-1, FFS-5, FFS-6, and FFS-7, where structures currently exist within the proposed SHD but are not residential, would be verified as vacant before allowing the JTE system to be utilized at these emitter locations. If not vacant, the JTE would not be utilized at these locations.
- The proximity to populated areas would continue to be monitored to determine constraints associated with the site and respective operational parameters of the specific system.

4.5 AIR QUALITY

4.5.1 Affected Environment

Emitter sites would be located in various locations across the northwest Florida panhandle. To adequately capture emissions over such a broad area and to accommodate the changing emitter site locations the Mobile-Pensacola-Panama City-Southern Mississippi Interstate AQCR is used as the ROI. This AQCR includes 50 counties from Alabama, Florida, and southern Mississippi. The baseline emissions from counties within the AQCR are shown in [Table 4-3](#). Emitter locations would all be within Florida, and all counties in the Florida panhandle are in attainment for all criteria pollutants.

Table 4-3. Mobile-Pensacola-Panama City-Southern Mississippi Interstate AQCR Emissions

County	Pollutant (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Mobile-Pensacola-Panama City-Southern Mississippi AQCR	1,114,898	257,441	207,285	63,037	200,811	1,292,764	32,593,539

Source: USEPA, 2013

AQCR = Air Quality Control Region; CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides;

PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

4.5.2 Environmental Consequences

Emitter sites would involve the use of generators at sites where power utilities are not available. Mobile emitters would require vehicle transportation to the location, which would cause some air pollutant emissions. Emissions of air pollutants from emitter sites would be negligible compared with the AQCR ([Table 4-4](#)).

Table 4-4. Air Pollutant Emissions for Emitter Sites

Emitter Emissions	Emissions ¹ (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Estimated average/event	0.28	0.00	0.01	0.01	0.00	0.06	1.01
Maximum emissions/year	0.78	1.57	0.15	0.15	0.10	0.21	140.58
AQCR	1,114,898	257,441	207,285	63,037	200,811	1,292,764	32,593,539
Percent of AQCR Emissions ²	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

AQCR = Air Quality Control Region; CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides;

PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

1. Emissions calculated assume that 5 emitter sites operate simultaneously per event and each generator operates for 6 hours per event.

2. Maximum emissions per year are compared with AQCR emissions.

1 **4.5.3 Impact Summary**

2 [Table 3-18](#) identifies the context, intensity, and duration factors utilized in air quality impact
 3 analysis; based on these factors, the Air Force has not identified adverse air quality impacts to
 4 public health and safety or the human and natural environment associated with emitter sites.
 5 [Table 4-5](#) summarizes the impacts identified. Impacts are categorized as follows:

- 6 • Adverse (yellow)
- 7 • Neutral/no effect (green)

8 **Table 4-5. Impact Summary for Air Quality – Emitters**

	Emitter Location														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Air quality	No adverse impacts would occur. Emissions from emitter use are less than 0.001 percent of regional air emissions for both criteria pollutants and greenhouse gases.														
Greenhouse gases															

9 **4.5.4 Proposed Resource-Specific Mitigations**

10 In the absence of any identified adverse air quality impacts, no Resource-Specific Mitigations
 11 for air quality have been identified.

12 **4.6 EARTH RESOURCES**

13 Based on the scope of action described in Chapter [2](#), and as identified in Chapter [3](#), emitter
 14 site use would not be expected to affect any earth resources because all sites are either
 15 “improved” or “semi-improved.” Most sites would require few, if any, minor improvements to
 16 support the emitters. Consequently, this resource area is not discussed further in this chapter.

17 **4.7 WATER RESOURCES**

18 Based on the scope of action described in Chapter [2](#), and as identified in Chapter [3](#), emitter
 19 site use would not be expected to affect any water resources because all sites are either
 20 “improved” or “semi-improved.” Most sites would require few, if any, minor improvements to
 21 support the emitters and no water resources would be affected. Consequently, this resource
 22 area is not discussed further in this chapter.

23 **4.8 BIOLOGICAL RESOURCES**

24 As discussed in Chapter [3](#), biological resources would not be affected by emitters, as these
 25 instruments would be operated on improved and semi-improved areas. As a result, this
 26 resource area is not discussed further in this chapter.

4.9 CULTURAL RESOURCES

As discussed in Chapter 3, emitter site use does not have the potential to impact cultural resources. Sites have been previously developed with adequate infrastructure in place. Therefore, this resource area is not discussed further in this chapter.

4.10 LAND USE

4.10.1 Affected Environment

The majority of the 12 emitter sites are located on FFS land (FFS-1 through FFS-9); the remaining sites are located on FWC land (FWC-1 and FWC-2) and Eglin AFB (EAFB-1). See Figure 2-3 through Figure 2-5 for a regional and local view of emitter sites. All sites are currently listed as either “improved” or “semi-improved.”

General land use types associated with the proposed emitter sites include barren land, forested, urban/built up, and wetlands (FDEP, 2007b). Table 4-6 lists the land uses in each emitter site. For the majority of the FFS sites, the dominant land use is urban/built up, while both FWC sites are forested and the Eglin AFB site is located in a parcel of barren land.

Table 4-6. Land Use Type Associated with Emitter Sites

Land Use Type	Emitter Location (Land Use Type Present at Emitter Site)												
	FFS-1	FFS-2	FFS-3	FFS-4	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FFW-1	FFW-2	EAFB-1	
Barren land													•
Forested				•						•	•		
Urban/built up	•	•	•		•	•	•	•					
Wetlands									•				

Source: FDEP, 2007b

4.10.2 Environmental Consequences

Emitter site use would not be expected to result in significant adverse impacts to this resource, because no significant noise (Sections 3.3 and 4.3) or safety (Sections 3.4 and 4.4) impacts have been identified that would impact existing land use. Only those emitters that use a generator as a power source would increase the noise level; however, the noise would be intermittent and would not result in adverse impacts (see Section 4.3, Noise).

Safety concerns associated with the emitter systems are further detailed in Section 4.4.2, *Safety, Environmental Consequences*. Only the JTE system has the potential to emit EMR and, therefore, must not be placed within 400 feet of habitable buildings or recreational sites, nor within 268.7 feet of EED storage or 198.3 feet from fuel (see Section 4.4.2). Table 4-1 located in Section 4.4.2 lists the potential acceptable JTE emitter sites based on the SHD of 400 feet, which would result in no impacts to the population. All sites would be acceptable for radar and telemetry units.

1 **4.10.3 Impact Summary**

2 [Table 3-41](#) identifies the context, intensity, and duration factors utilized in land use analysis;
 3 based on these factors the Air Force has identified the potential for insignificant adverse
 4 impacts to public health and safety at four proposed emitter sites associated with the JTE SHD
 5 and proximity to inhabited buildings. This impact can be mitigated through actions
 6 described in Section [4.4.4](#). The Air Force has not identified any significant land use impacts
 7 associated with emitter sites. [Table 4-7](#) summarizes the impacts identified. Impacts are
 8 categorized as follows:

- 9 • Adverse (yellow)
- 10 • Neutral/no effect (green)

11 **Table 4-7. Impact Summary for Land Use – Emitters**

Receptor	Emitter Site											
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1	FWC-2
Land Use	**					**	**	**				

* This assumes no joint threat emitter (JTE) locations
 ** Adverse impacts can be mitigated as described in Section [4.4.4](#)

12 **4.10.4 Proposed Resource-Specific Mitigations**

13 Proposed Resource-Specific Mitigations as described in Section [4.4.4](#) would offset any
 14 potential land use impacts and mitigate impacts from adverse (yellow) to beneficial or no
 15 effect (green) through avoidance of any land use conflicts.

16 **4.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE**

17 **4.11.1 Affected Environment**

18 The main concern for socioeconomics and environmental justice resource areas is the
 19 potential noise and safety hazards associated with the emitter sites that could potentially
 20 impact nearby populations and noise-sensitive receptors, such as schools and childcare
 21 centers.

22 The 12 emitter sites are located across nine counties in northwest Florida. The county
 23 represents the region of comparison for evaluating disproportionate effects (in Section [4.11.2](#))
 24 on populations of concern for environmental justice and for children. [Table 4-8](#) lists the total
 25 population of each county and the portion of minority, low-income, and youth populations
 26 out of the total county population in which the emitter sites are located. The closest
 27 population to the emitter sites is provided in [Table 2-1](#) in Chapter [2](#). There are no sensitive
 28 noise receptors (e.g., schools, childcare centers) within 1 mile of any of the emitter sites.

1

Table 4-8. County Data for Emitter Site Locations

Emitter Site ID	Location	Total Population	Minority (%)	Low-Income ¹ (%)	Youth (%)
FFS-7, FFS-9	Bay	168,852	20.8%	12.4%	22.0%
FFS-8	Calhoun	14,625	22.3%	25.2%	21.4%
FFS-5	Escambia	297,619	33.8%	16.9%	21.6%
FFW-1, FFW-2, FFS-2	Franklin	11,549	20.4%	24.0%	17.1%
FFS-6	Gulf	15,863	25.1%	17.5%	16.2%
EAFB-1	Okaloosa	180,822	22.9%	11.7%	22.3%
FFS-1	Santa Rosa	151,372	15.0%	10.8%	23.9%
FFS-3	Walton	55,043	14.9%	14.9%	20.6%
FFS-4	Washington	24,896	21.5%	20.3%	21.2%
	Florida	18,801,310	42.1%	14.7%	21.3%
	United States	308,745,538	36.3%	14.3%	24.0%

Source: U.S. Census Bureau 2010, 2013

1. American Community Survey, 5-year estimate, 2007–2011

2 4.11.2 Environmental Consequences

3 No significant noise (Sections [3.3](#) and [4.3](#)), safety (Sections [3.4](#) and [4.4](#)), or land use
4 (Sections [3.10](#) and [4.10](#)) impacts have been identified that would affect the surrounding
5 populations. Thus, emitter site use would not be expected to result in significant adverse
6 impacts to socioeconomic or environmental justice resources. Use of emitters powered by a
7 generator would increase the noise level; however, the noise would be intermittent and
8 would not result in adverse impacts (see Section [4.3](#), *Noise*).

9 As discussed in Section [4.10.2](#), the JTE system would not be located at Sites FFS-1, FFS-2,
10 FFS-3, and FFS-4, due to the proximity of residential structures within the SHD. As a result, no
11 adverse impacts would be associated with emitter use at these locations.

12 Sites EAFB-1, FFS-5, FFS-6, and FFS-7 currently have structures within or near proposed SHDs,
13 but these structures are not residential. However, to ensure no one is exposed to EMR, these
14 sites would need to be evaluated prior to JTE use to ensure no persons are inside the
15 structures. This mitigation would avoid the potential for adverse impacts.

16 Environmental Justice and Special Risks to Children

17 All 12 proposed emitter sites are located in counties with either a disproportionate
18 percentage of low-income populations, youth populations, or both as compared with the
19 state, or community of comparison (COC). However, the use of emitters would not result in
20 disproportionate impacts to minority or low-income populations or pose a special risk to
21 children, as long as appropriate mitigations are implemented. The mitigations detailed in
22 Section [4.4.4](#) would prevent significant noise or safety impacts to populations, inhabited
23 areas, or noise-sensitive locations (such as schools). Furthermore, those emitters powered by
24 generators would create noise but only intermittently and at levels that would not harm
25 individuals. Safety concerns would not significantly impact environmental justice areas,
26 because emitter use would avoid impacts through SHD constraints analysis (see *Safety*,
27 Section [4.4](#)). The JTE is the only emitter that has an SHD, and JTE use would be restricted to
28 areas not encroaching on inhabited buildings, schools, and other populated areas. (See

1 Safety, Section 4.4.2 for potential JTE locations that would not interfere with populations or
 2 pose a special risk to children.)

3 **4.11.3 Impact Summary**

4 Table 3-44 identifies the context, intensity, and duration factors utilized for socioeconomic
 5 and environmental justice impact analysis; based on these factors the Air Force has identified
 6 the potential for insignificant adverse impacts to public health and safety at four proposed
 7 emitter sites associated with the JTE SHD and proximity to inhabited buildings. This impact
 8 can be mitigated through actions described in Section 4.4.4. The Air Force has not identified
 9 any significant socioeconomic/environmental justice impacts associated with emitter sites.

10 Table 4-9 summarizes the impacts identified. Impacts are categorized as follows:

- 11 • Adverse (yellow)
- 12 • Neutral/no effect (green)

13 **Table 4-9. Impact Summary for Socioeconomics/Environmental Justice – Emitters**

Receptor	Emitter Site											
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1	FWC-2
Environmental justice/special risks to children	**					**	**	**				

* This assumes no joint threat emitter (JTE) locations
 ** Adverse impacts can be mitigated as described in Section 4.4.4

14 **4.11.4 Proposed Resource-Specific Mitigations**

15 Proposed Resource-Specific Mitigations as described in Section 4.4.4 would offset any
 16 potential land use impacts and mitigate impacts from adverse (yellow) to beneficial or no
 17 effect (green) through avoidance of any land use conflicts.

18 **4.12 SOLID AND HAZARDOUS MATERIALS/WASTE**

19 As discussed in Chapter 3, no impacts associated with solid and hazardous materials/waste
 20 resulting from emitter use have been identified. As a result, this resource area is not
 21 discussed further in this chapter.

22 **4.13 INFRASTRUCTURE AND TRANSPORTATION**

23 As identified in Chapter 3 (Section 3.13.2), emitter site use would not be expected to result in
 24 adverse impacts to utilities or transportation resources. As a result, this resource area has not
 25 been carried forward for detailed analysis.

4.14 EMITTER SITES IMPACT SUMMARY

Overall, there is little interaction between emitter site use and environmental/anthropogenic resources. All sites are either improved or semi-improved and negligible improvements, such as installation of fencing or small areas of tree topping/clearing (approximately 0.6 acres at two or three sites), would not result in adverse impacts. Issues associated with safety, land use, and related socioeconomics and environmental justice resulting from emitter SHDs can be resolved by restricting use of the JTE at certain locations.

Table 4-10 summarizes the impacts identified with emitter site use, by site, for potentially affected resources based on analyses presented in Chapter 3, Sections 3.2 through 3.13, and Chapter 4, Sections 4.2 through 4.13. Impacts are categorized as follows:

- Adverse (yellow) – Impacts to public health and safety, the human or natural environment or potential violation of federal, state, or local regulations
- Neutral / No Effect (green)

No significant adverse impacts have been identified. Resource-Specific Mitigations (in Section 4.14.1) would serve to minimize or avoid any identified adverse impacts.

Table 4-10. Emitter Sites Impact Summary

Affected Resource	Emitter Site											
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8*	FFS-9*	FWC-1*	FWC-2*
Airspace (Section 3.2/4.2)												
Noise (Section 3.3/4.3)												
Safety (Section 3.4/4.4)	**					**	**	**				
Air Quality (Section 3.5/4.5)												
Earth Resources (Section 3.6/4.6)												
Water Resources (Section 3.7/4.7)												
Biological Resources (Section 3.8/4.8)												
Cultural Resources (Section 3.9/4.9)												
Land Use (Section 3.10/4.10)	**					**	**	**				
Socio/EJ (Section 3.11/4.11)	**					**	**	**				
Haz/Solid Materials & Waste (Section 3.12/4.12)												
Infrastructure (Section 3.13/4.13)												

* This assumes no joint threat emitter (JTE) locations

** Adverse impacts can be mitigated as described in Section 4.14.1

1 **4.14.1 Proposed Resource-Specific Mitigations**

2 The following Proposed Resource-Specific Mitigations have been identified for emitter site
3 use and would result in impacts from adverse (yellow) to neutral/no effect (green).

4 **Safety/Land Use/Socioeconomics & Environmental Justice**

- 5 • Sites EAFB-1, FFS-5, FFS-6, and FFS-7, where structures currently exist within the
6 proposed SHD but are not residential, would be verified as vacant before allowing the
7 JTE system to be utilized at these emitter locations. If not vacant, the JTE would not be
8 utilized at these locations.
- 9 • Continue to monitor the proximity to populated areas to determine constraints
10 associated with the site and respective operational parameters of the specific system.

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5. BLACKWATER RIVER STATE FOREST AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

5.1 INTRODUCTION

This chapter addresses the receptors identified in Chapter 3 (Affected Environment) specific to BRSF and the impacts (Environmental Consequences) on those receptors by the various effectors associated with the Proposed Action. As discussed in Chapter 3, Section 3.14 some resource areas would experience no interaction with this activity, or general impact analyses in Sections 3.2 through 3.13 have shown that there would be negligible or no impacts to a specified resource area, despite the site-specific nature of the resources. Additionally, in some cases the general analyses provided in Chapter 3 are sufficient to determine the extent of impacts on site-specific resources in that the general analysis is applied to the site-specific resources identified as the affected environment.

As noted in previous chapters, analyses rely heavily on previous NEPA documentation for similar activities within similar environments; these documents are incorporated by reference in certain sections where applicable, and are noted. Finally, the affected environment discussions provide information regarding the types of resources present; however, to avoid encyclopedic repetition of publicly available information the reader is directed to locations outside this document for such information should the reader desire it. As an example, the fact that sensitive species are present on BRSF is addressed and types, quantities and locations (where applicable and allowed by law) are described. However, as discussion of each individual species in terms of physical description and foraging/reproductive aspects are encyclopedic and readily available from various sources, the reader is directed to a location (e.g., the USFWS or Florida Natural Areas Inventory [FNAI] website) for this information. This is in keeping with 40 CFR requirements.

Training activity impact analyses consider the General Operational Constraints provided in Section 2.5. These are based on the establishment of the Protection Levels identified in Table 2-24 as well as the noise protection levels resulting from impact analysis in Section 3.3, and presented in Table 2-25. The following Figure 5-1 through Figure 5-10 provide graphical representation of the protection levels for ground operations at BRSF as a whole, and for each individual tactical area. Figure 5-11 through Figure 5-20 provide similar information for noise-generating activities at BRSF. Each map is a “clickable” thumbnail image that will provide full-screen viewing; each map is also available for full-page printing in Appendix A.

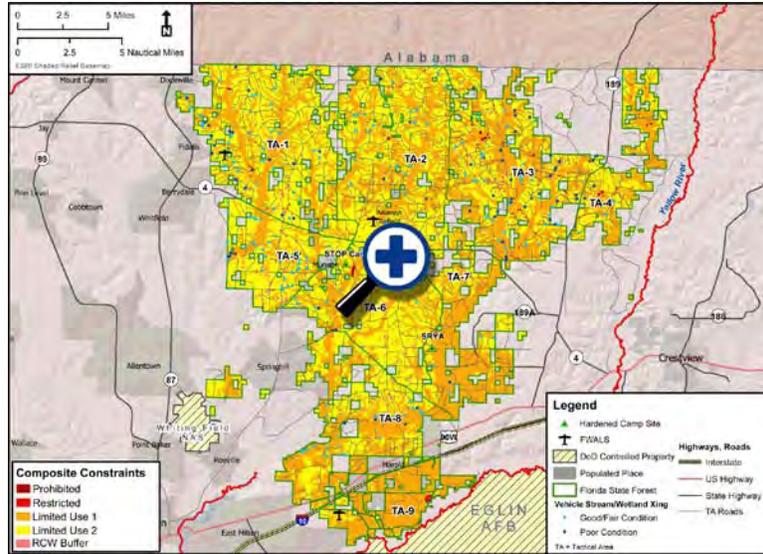


Figure 5-1. BRSF Ground Operations Protection Levels

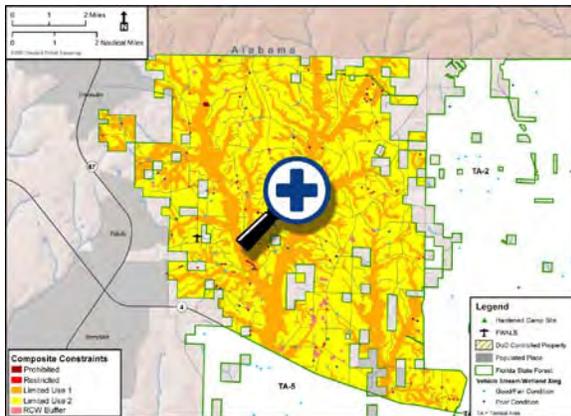


Figure 5-2. BRSF TA-1 Ground Operations Protection Levels

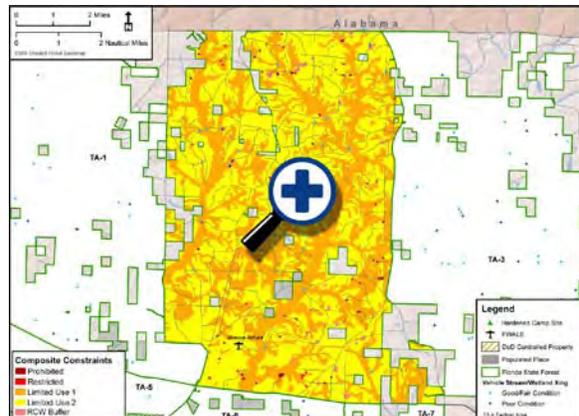


Figure 5-3. BRSF TA-2 Ground Operations Protection Levels

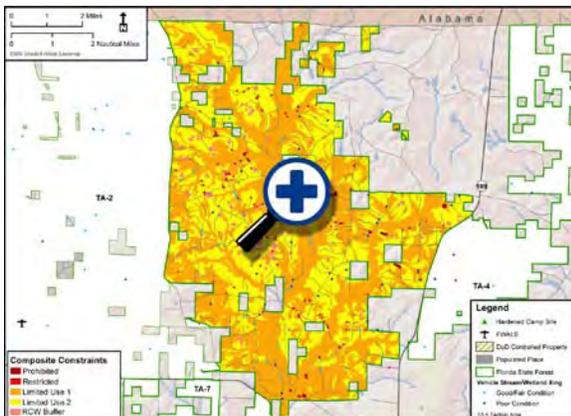


Figure 5-4. BRSF TA-3 Ground Operations Protection Levels

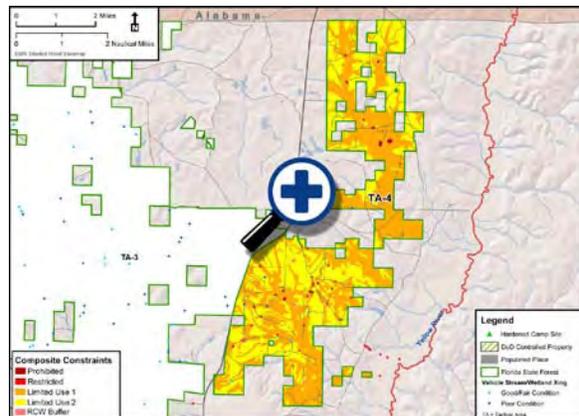


Figure 5-5. BRSF TA-4 Ground Operations Protection Levels

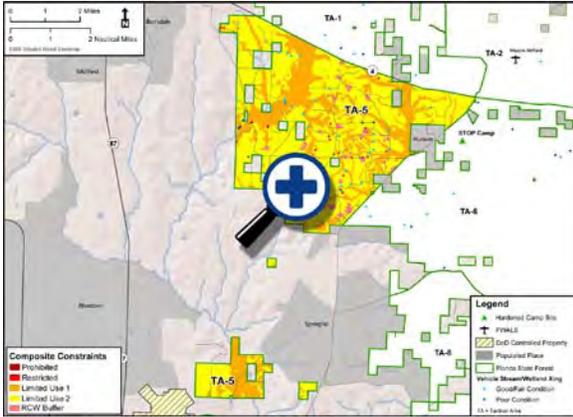


Figure 5-6. BRSF TA-5 Ground Operations Protection Levels

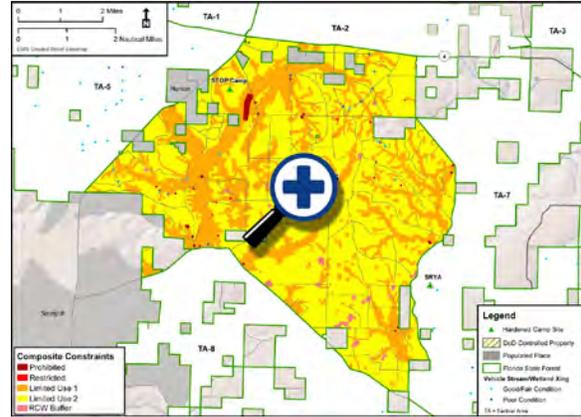


Figure 5-7. BRSF TA-6 Ground Operations Protection Levels

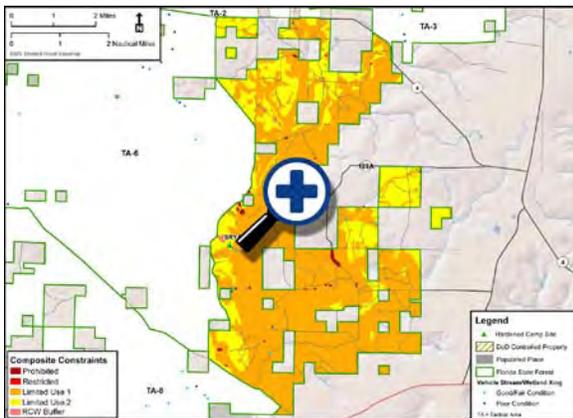


Figure 5-8. BRSF TA-7 Ground Operations Protection Levels

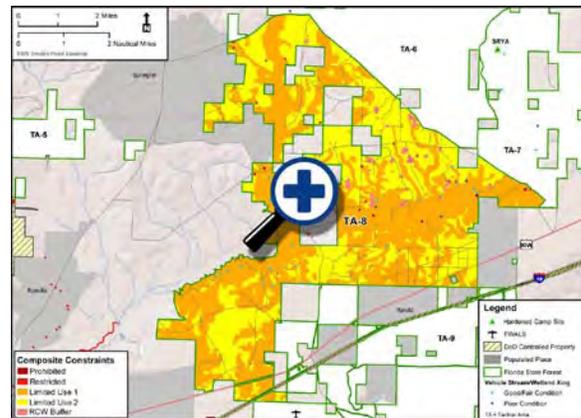


Figure 5-9. BRSF TA-8 Ground Operations Protection Levels

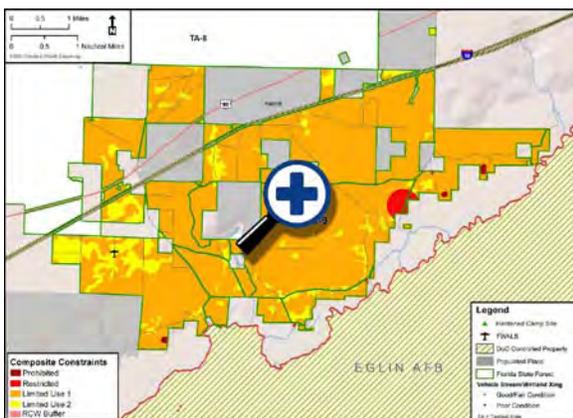


Figure 5-10. BRSF TA-9 Ground Operations Protection Levels

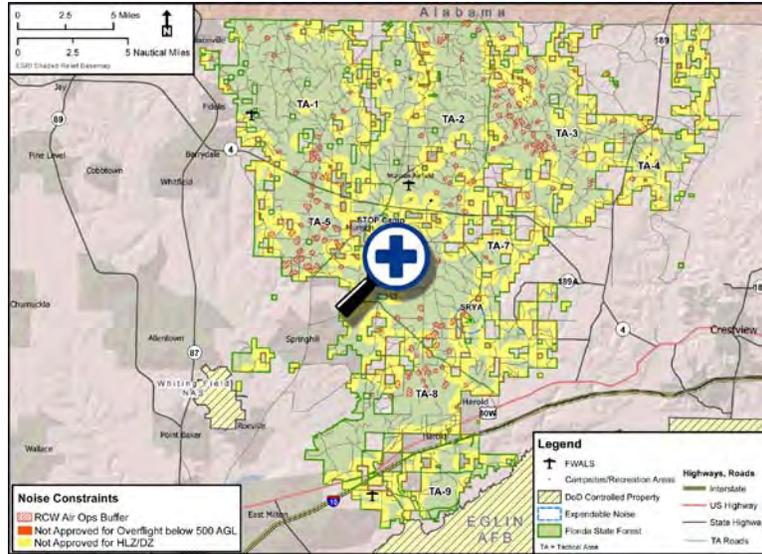


Figure 5-11. BRSF Noise Protection Levels



Figure 5-12. BRSF TA-1 Noise Protection Levels

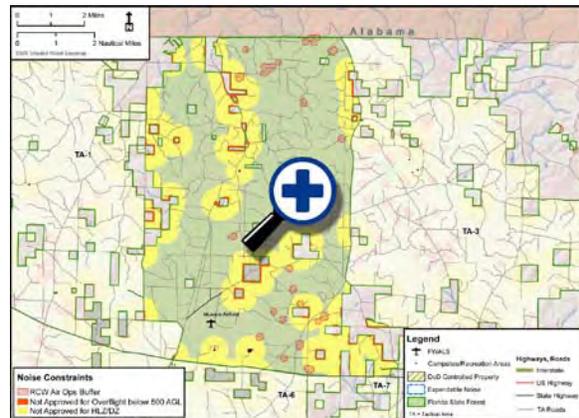


Figure 5-13. BRSF TA-2 Noise Protection Levels

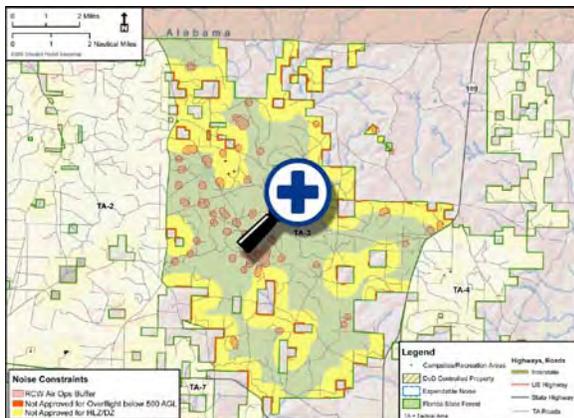


Figure 5-14. BRSF TA-3 Noise Protection Levels

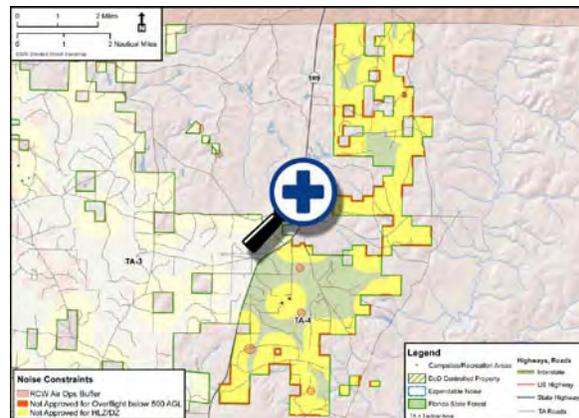


Figure 5-15. BRSF TA-4 Noise Protection Levels

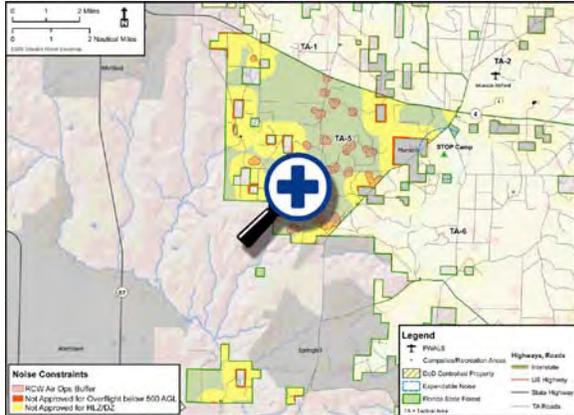


Figure 5-16. BRSF TA-5 Noise Protection Levels

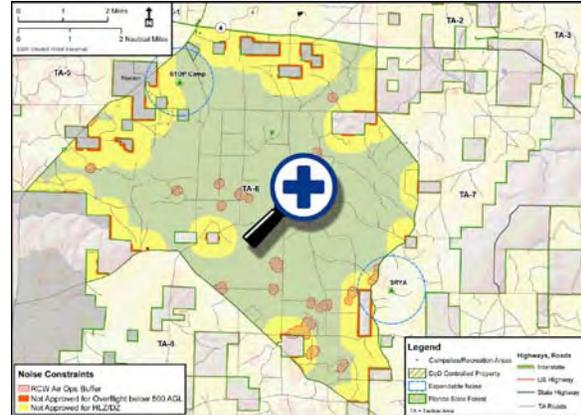


Figure 5-17. BRSF TA-6 Noise Protection Levels

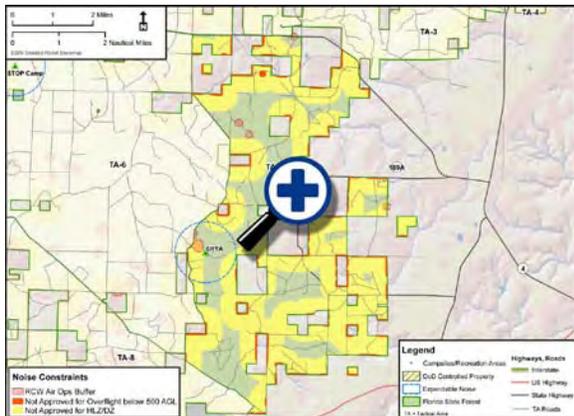


Figure 5-18. BRSF TA-7 Noise Protection Levels

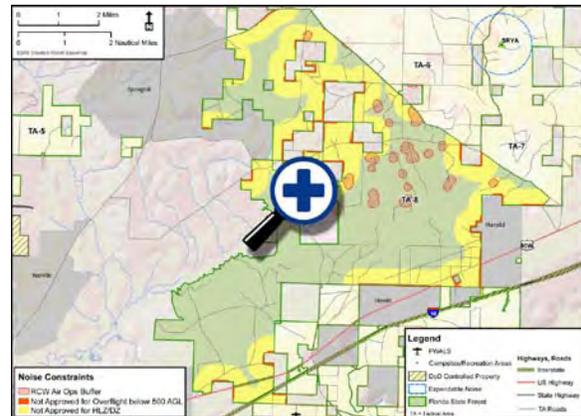


Figure 5-19. BRSF TA-8 Noise Protection Levels

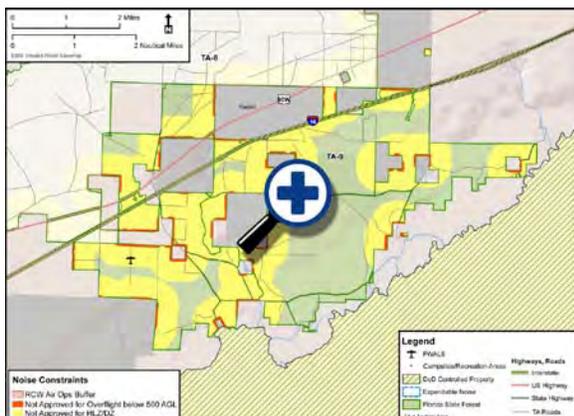


Figure 5-20. BRSF TA-9 Noise Protection Levels

- 1 The surface area of BRSF covered by the various ground and noise protection levels per
 2 tactical area is provided in [Table 5-1](#).

3 **Table 5-1. BRSF Protection Level Coverage**

Protection Level*	Tactical Area									BRSF Total
	1	2	3	4	5	6	7	8	9	
Ground Operations Protection Levels										
Prohibited										
Acres	160	100	256	60	13	154	108	44	43	939
% of Area	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Restricted										
Acres	0								104	104
% of Area									<1	<1
RCW (200-foot buffer)										
Acres	179	153	368	17	400	191	25	205	0	1,536
% of Area	<1	<1	<1	<1	<1	<1	<1	<1		<1
LU-1										
Acres	11,800	14,743	18,585	6,337	4,795	7,679	12,161	12,565	10,628	99,292
% of Area	34	41	57	55	30	32	75	56	89	48
LU-2										
Acres	22,536	20,884	13,977	5,095	11,301	16,487	3,890	9,754	1,188	105,114
% of Area	65	59	43	44	70	68	24	44	10	51
Noise Protection Levels										
Not approved for aircraft overflights below 500 AGL										
Acres	628	660	943	585	372	478	670	479	392	5,207
% of Area	2	2	3	5	2	2	4	2	3	3
Not approved for HLZs/DZs										
Acres	9,901	12,316	14,581	8,173	6,660	7,878	11,253	8,558	7,127	86,448
% of Area	29	35	45	71	41	32	70	38	60	42
Not approved for noise-generating expendables										
Acres	Not applicable – Noise-generating expendables would only be used at the STOP Camp and SRYA sites. The noise maps show the extent to which noise would extend beyond these locations from training activities (4,000 feet).									
% of Area										
RCW air operations buffer**										
Acres	701	611	1,468	88	1,248	671	110	702	0	5,598
% of Area	2	2	4	<1	8	3	<1	3		3

AGL = above ground level; BRSF = Blackwater River State Forest; DZ = drop zone; HLZ = helicopter landing zone;

LU-1 = Limited Use 1; LU-2 = Limited Use 2; RCW = red-cockaded woodpecker; STOP = Short-Term Offender Program; SRYA = Santa Rosa Youth Academy

* Acreages and percentages are rounded to the nearest whole number unless value is less than 1%, in which case value is indicated as <1%.

** Represented by red hatched areas on [Figure 5-11](#) through [Figure 5-20](#).

5.2 AIRSPACE MANAGEMENT AND USE

5.2.1 Affected Environment

Airspace in the region is heavily trafficked and supports a high level of military aviation. The airspace is carefully managed to provide for safe and efficient operations of both military and civilian aircraft.

5.2.1.1 Military Training Airspace

BRSF underlies several military training airspace units, as shown in [Figure 5-21](#). [Table 5-2](#) lists the characteristics of the airspace units and the approximate number of sorties flown in the airspace unit under baseline conditions.

Table 5-2. Characteristics of Airspace Units Overlying BRSF

Airspace	Airspace Type	Airspace Floor	Airspace Ceiling	Airspace Published Use Times	Managed By	Annual Sortie Operations
A-292	Alert area	Surface	3,000 feet within federal airways; FL 175 in other areas	Sunrise to 0100 Mon-Fri and sunrise to sunset Sat.	Training Wing Six, Pensacola NAS	Not scheduled
Pensacola North MOA	MOA	10,000 feet MSL	UTBNI 18,000 feet MSL	Sunrise to sunset, Mon-Sat, occasional use until 2400	Training Air Wing Five, Pensacola.	1,802 ^a
Eglin MOA A West	MOA	1,000 feet AGL (200 feet AGL with NOTAM)	UTBNI 18,000 feet MSL	0600-2100 Mon-Fri	Air Armament Center, Eglin AFB	2,188 ^a
Eglin MOA A East	MOA	1,000 feet AGL (200 feet AGL with NOTAM)	UTBNI 18,000 feet MSL	0600-2100 Mon-Fri	Air Armament Center, Eglin AFB	2,188 ^a
Eglin MOA B	MOA	1,000 feet AGL (200 feet AGL with NOTAM)	UTBNI 18,000 feet MSL	0600-2100 Mon-Fri	Air Armament Center, Eglin AFB	1,703 ^a
IR-021	MTR	5,000 feet MSL ^b	11,000 feet MSL ^c	1200-0400z Mon-Fri (occasional weekend use)	FACSFAC	26
IR-057	MTR	200 feet AGL ^b	3,000 feet MSL ^c	Continuous	1 SOG/OGO, Hurlburt Field	0 ^a
IR-059	MTR	200 foot AGL ^b	3,000 foot MSL ^c	Continuous	1 SOG/OGO, Hurlburt Field	0 ^a
R-2915A	Restricted area	Surface	Unlimited	Continuous	46th Operations Support Squadron, Eglin AFB	6,953 ^a

AGL = above ground level; IR = instrument route; MOA = military operations area; MSL = mean sea level; MTR= military training route; NAS = Naval Air Station; NOTAM = notice to airmen; UTBNI = up to, but not including

a. Calendar year 2010

b. Floor altitudes vary by segment. Lowest floor of MTR is listed in the table.

c. Ceiling altitudes vary by segment. Highest ceiling of MTR is listed in the table.

1 Alert Area 292 supports Navy training
 2 across a wide area at altitudes
 3 between ground elevation and
 4 3,000 feet AGL (17,500 feet mean sea
 5 level [MSL] outside of federal airways).
 6 Alert areas are designated so that
 7 nonparticipating pilots will be aware
 8 of an increased number of flights in
 9 the area. The alert area is not
 10 scheduled, and Navy operations in
 11 the alert area do not preclude the
 12 operations of any other aircraft in the
 13 same area at the same time.

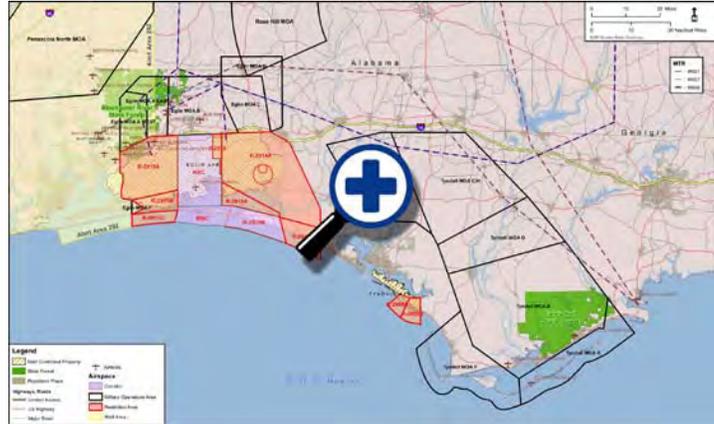


Figure 5-21. Special Use Airspace Units and Airfields

14 Pensacola North MOA is also managed by the Navy and used for training flights. The MOA
 15 has a floor altitude of 10,000 feet MSL.

16 Eglin A and B MOAs normally have floor altitude of 1,000 feet AGL, but this floor may be
 17 lowered to 200 feet AGL if a NOTAM is published. These MOAs overlie the central portion of
 18 BRSF and are used by about 2,200 sorties per year.

19 Three military training routes traverse BRSF. The floor altitudes of the three routes vary by
 20 segment. The lowest segment of IR-021 has floor altitude of 5,000 feet MSL, the lowest
 21 segment of IR-057 has a floor altitude at 200 feet AGL, and the lowest segment of IR-059 has a
 22 floor altitude of 200 feet AGL. These military training routes (MTRs) are used infrequently, on
 23 the order of about once every other week.

24 R-2915A supports a wide variety of test and training activities and is managed by Eglin AFB.
 25 The RA is heavily utilized by units conducting hazardous activities such as munitions training.
 26 Currently, the RA is also used for nonhazardous training events of the types that would occur
 27 at BRSF and THSF under the GLI.

28 **5.2.1.2 Airfields and Transiting Aircraft**

29 Jacksonville ARTCC is responsible for monitoring and controlling aircraft in the region while
 30 en route. ATC and RAPCON/TRACON facilities manage aircraft operating in their respective
 31 terminal areas.

32 [Table 5-3](#) lists airfields located at or near BRSF, along with the approximate number of airfield
 33 operations currently flown per year. Blackwater/Munson Airfield is located in central BRSF
 34 and supports FFS as well as general aviation operations. The FFS conducts aircraft operations
 35 over BRSF as part of controlled burns, aerial surveys, and other operations. The frequency of
 36 these flights is variable from one season to the next depending on the number of prescribed
 37 burns conducted and other factors (Colburn, 2013). Brewton Municipal, Bob Sikes, Northwest
 38 Florida Regional, and Peter Prince Airports are civilian airfields, but each also supports military
 39 aircraft operations. Harold Naval outlying landing field (NOLF) Heliport, Santa Rosa outlying
 40 landing field (OLF), Whiting Field NAS North, Whiting Field NAS South are military airfields.
 41 Several smaller airfields in the area are owned by private individuals or corporations, and the
 42 number of annual operations at these airfields is not reported.

1

Table 5-3. Airfields In or Near BRSF

Airfield Name ^a	Approximate Annual Airfield Operations
Blackwater/Munson Airfield	1,460 ^b
Brewton Municipal Airport	165,500 ^c
Bob Sikes Airport	48,600 ^c
Harold NOLF Heliport	180,000 ^d
Northwest Florida Regional Airport	57,027 ^c
Peter Prince Field	94,000 ^c
Santa Rosa Naval Outlying Field	185,000 ^d
Whiting Field NAS North	70,000 ^d
Whiting Field NAS South	130,000 ^d
Dotson Airport	NR
George T McCutchan Airport	NR
Golden Harvest Flying Service Incorporated Airport	NR
Lonesome Pines Airport	NR
Sky Ranch	NR
Thomas Farms Airport	NR
Yellow River Airstrip	NR

NAS = Naval Air Station; NOLF = Naval Outlying Landing Field; NR = no report

a. Private airfields listed are located within approximately 3 miles from the forest. Larger public airports listed are located within approximately 10 miles of the forest.

b. Colburn, 2013

c. FAA, 2013

d. U.S. Air Force, 2011a

2 The Crestview Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid
3 (VORTAC), which is located near BRSF, is a convergence point of victor routes 198, 241, 115,
4 and 329. Victor routes extend vertically from 1,200 feet AGL up to but not including
5 18,000 feet MSL. Aircraft transiting the area en route to northwest Florida typically travel
6 through the North-South Corridor located between R-2915A and R-2914A.

7 Class C airspace associated with NAS Whiting Field overlies BRSF at altitudes between 1,400
8 and 4,200 feet MSL at distances between 5 and 10 nautical miles (NM) from the field. At
9 distances less than 5 NM from NAS Whiting Field, Class C airspace extends from 4,200 feet
10 MSL to the surface. Aircraft entering Class C airspace must first establish two-way
11 communications with the ATC tower.

12 **5.2.2 Environmental Consequences**

13 As discussed in Section 3.2, airspace management and use would only be potentially
14 adversely affected by aircraft operations. Other Proposed Action effectors are not addressed
15 in this section.

16 Implementation of the Proposed Action would increase military aircraft activity in the
17 airspace above BRSF. As many as nine sorties per annual average day could be conducted

1 over BRSF, and each sortie would include up to four aircraft. Section [2.3](#) describes types of GLI
2 training events, including the expected frequency of occurrence.

3 Aircraft conducting GLI training would operate in compliance with all federal aviation
4 regulations. The training would not require segregation from nonparticipating aircraft nor
5 would it have to occur in SUA. No new SUA or modifications to existing SUA would be
6 required to support the proposed training, nor would any modifications to existing non-SUA
7 boundaries be needed.

8 **5.2.2.1 Scheduling/Coordination**

9 As described in Section [5.2.1](#), BRSF is overlain by several special use airspace units
10 (see [Figure 5-21](#)). Most GLI aircraft training would be conducted below the 1,000-foot AGL
11 floor altitudes of the Eglin MOAs and the 10,000-foot MSL floors of the Pensacola MOAs.
12 R-2915A overlies a small portion of southern BRSF and extends from the surface to unlimited
13 altitude. In keeping with current mission planning procedures, SUA managing agencies
14 would be contacted prior to the mission to ensure airspace availability. As most GLI missions
15 would use altitudes not included in SUA, the number of missions requiring the use of existing
16 SUA would be expected to be low. Current internal DoD scheduling procedures would be
17 expected to be sufficient to handle minor increases in SUA usage rates.

18 As discussed in Sections [1.3](#) and [1.4](#), a large part of the purpose and need for the GLI is to
19 alleviate overscheduling of the Eglin Range by moving nonhazardous training currently
20 occurring there to other locations. Implementation of the Proposed Action would reduce
21 scheduling and coordination concerns related to the Eglin Range Complex.

22 Operations in alert areas such as A-292 do not require exclusion of other aircraft operations,
23 and nonparticipating aircraft transit the alert area frequently while training is under way.
24 Knowing that an alert area supports a high volume of pilot training flights, pilots operating in
25 the alert area practice the “see-and-avoid” method. GLI training operations in portions of
26 A-292 located above BRSF would not affect scheduling of the airspace, because the airspace is
27 not scheduled.

28 Sorties on MTRs may also occur simultaneously with other military training in the same area.
29 Operations on IR-059/IR-057 and IR-021 that traverse BRSF would not need to be scheduled to
30 not occur outside the times of GLI training events. Pilots involved in GLI training would be
31 made aware of scheduled MTR traffic during mission planning and pre-flight briefings.

32 GLI training missions would be coordinated with BRSF to ensure de-confliction with all BRSF
33 activities. This coordination would be a new process and conducted prior to any GLI aircraft
34 operation.

35 **5.2.2.2 Efficiency of Ongoing Operations**

36 As discussed previously, GLI was devised in part to avoid scheduling conflicts on Eglin Range
37 by relocating nonhazardous training events currently conducted there. Implementation of
38 the Proposed Action would have a beneficial impact, in that it would permit continued
39 growth in the tempo of testing and training operations on Eglin Range. Increased usage of
40 SUA over BRSF (i.e., Eglin A and B MOAs) would be expected to be minimal as the floor
41 altitude of those airspace units is higher than the altitude at which most GLI training would
42 occur.

1 GLI training events would be conducted in compliance with all federal aviation regulations,
 2 operating in essentially the same manner and following the same rules as civilian aircraft.
 3 Much of the training would be conducted in Class G uncontrolled airspace. In Class G
 4 airspace, ATC does not provide separation, and aircraft would practice the see-and-avoid
 5 method at all times during training. Prior to entering Class C airspace associated with NAS
 6 Whiting Field, aircraft conducting GLI training would contact ATC to request permission to
 7 enter. There would be a minor increase in the number of aircraft handled by NAS Whiting
 8 Field ATC. Aircraft transiting the region on victor airways typically fly at altitudes higher than
 9 those proposed for GLI training. There would be little potential interaction between GLI
 10 training and operations on victor routes.

11 Coordination between the Air Force and State Forest POCs would be conducted to ensure
 12 that the efficiency of ongoing FFS activities would not be negatively affected. As long as this
 13 scheduling is conducted per the agreement between the Air Force and the FFS, no conflicts
 14 should occur.

15 5.2.3 Airspace Impact Summary

16 [Table 3-4](#) describes the context, intensity, and duration factors utilized in analysis for impacts
 17 to airspace; based on these factors the Air Force has identified insignificant adverse impacts
 18 to airspace. In summary, airspace management impacts would be regional and would
 19 include some positive impacts (i.e., reduced scheduling conflicts at Eglin Range) and some
 20 negative impacts (i.e., increased air traffic in controlled and uncontrolled airspace over BRSF).
 21 Impacts on scheduling and coordination processes would be moderate. Implementation of a
 22 coordination process between the Air Force and FFS would avoid potential operational
 23 conflicts that otherwise could be considered severe. Potential increases in scheduling
 24 demand for SUA over BRSF would be expected to be minor. Impacts to ongoing operations
 25 would be expected to be minor, as the proposed GLI training would not require blocking off a
 26 volume of airspace to be used exclusively by Air Force aircraft. Other operations would be
 27 able to continue to transit the area while GLI training is under way. Impacts would last for the
 28 entire life of the action, as air traffic tempo over BRSF would remain slightly elevated for as
 29 long as GLI training continues.

30 [Table 5-4](#) summarizes the impacts identified. Impacts are categorized as follows:

- 31 • Adverse (yellow)
- 32 • Neutral/no effect (green)

33 **Table 5-4. Airspace Impacts Summary – BRSF**

	Airspace Management Impacts	
	Scheduling/Coordination	Efficiency of Ongoing Operations
Aircraft Operations	Use of existing scheduled airspace (e.g, SUA) would be relatively infrequent. New coordination process would be implemented between Air Force and FFS to avoid operational conflicts.	Increased air traffic primarily at low altitudes over BRSF. See-and-avoid procedures used in uncontrolled airspace. Minor increases in ATC workload for operations transiting controlled airspace such as NAS Whiting Field Class C airspace. Coordination between Air Force and FFS would avoid operational conflicts.

ATC = air traffic control; BRSF = Blackwater River State Forest; SUA = special use airspace; FFS = Florida Forest Service; NAS = Naval Air Station

5.2.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for airspace management have been identified. All General Operational Constraints (Section 2.5) and Proposed Resource-Specific Mitigations identified previously in Section 3.2.4 would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

5.3 NOISE

5.3.1 Affected Environment

BRSF is used for recreational activities such as camping, hiking, hunting, fishing, and horseback riding, as well as for commercial activities such as logging. Ground vehicles, including passenger vehicles and heavy trucks, use the roads and trails on BRSF. Privately held parcels of land in BRSF are used for agriculture/silviculture and low-density residential development. USEPA has stated 44 dB and 51 dB as typical DNL noise levels at a farm area and a low-density residential area, respectively (USEPA, 1974). Based on measured noise levels in similar settings, ambient noise levels (i.e., while military training is not under way) in BRSF are assumed to be 45 dB DNL. SUA over BRSF is used by several types of military aircraft. Table 5-5 lists noise levels generated by individual overflights of several aircraft that use the training airspace over BRSF. Under current conditions, F-35 operations above BRSF are relatively infrequent.

Table 5-5. SEL Under the Flight Track for Aircraft Commonly Operating Above BRSF

Aircraft	SEL in dB ¹			Power	Speed (kts)
	500 feet AGL	1,000 feet AGL	10,000 feet AGL		
F-35A ²	127	120	94	95% ETR	475
A-10	97	91	55	5333 NF	325
C-130H	96	91	70	970 CTIT	180
T-6	98	93	73	100% engine torque	160
H-60	91	87	N/A	LFO Lite 140 kts	140
Single-engine, propeller-driven aircraft	84	79	61	70% RPM	160
UH-1	96	91	73	100% RPM	80
CV-22	87	84	67	LFO 200 kts	200

AGL = above ground level; dB = decibels; CTIT = turbine inlet temperature in degrees Celsius; ETR = engine thrust request; kts = knots; LFO Lite 140 kts = helicopter in level flight at 140 knots; LFO Lite 200 kts = helicopter in level flight at 200 knots; NF = fan speed; RPM = revolutions per minute; SEL = sound exposure level

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010).

The Eglin MOAs are used by a wide variety of aircraft primarily in conjunction with the adjacent Eglin Range. Eglin A and B MOAs are used for approximately 2,200 and 1,700 sorties per year, respectively. Pensacola North MOA is used primarily by T-6 and T-45 aircraft based at Whiting Field NAS for about 1,800 sorties per year. Even while operating at the lowest

1 altitude in the MOA (i.e., MOA floor altitude) of 10,000 feet AGL, individual overflight noise
2 levels generated by T-6 and T-45 aircraft are relatively low. The MTRs IR-021, IR-057, and IR-059
3 traverse BRSF but are used relatively infrequently. IR-021 is used for about 26 sorties per year,
4 while IR-059 and IR-057 are used rarely. Since MTR operations are infrequent, they are a
5 relatively insignificant part of the noise environment. R-2915 is used for approximately 6,953
6 sorties annually. Under current conditions, the noise level beneath R-2915A is 61 dB DNL_{mr},
7 and the noise levels generated by other SUAs and MTRs overlying BRSF is below 45 dB DNL_{mr}.

8 Civilian aircraft operations, including operations by FFS rotary- and fixed-wing aircraft, also
9 occur over BRSF. The Munson/Blackwater Airfield is used for about two aircraft operations per
10 average day, which consist primarily of single-engine Cessna aircraft. Baseline noise levels at
11 Munson/Blackwater airstrip do not exceed 55 dB DNL.

12 Munitions noise generated on Eglin Range, which is located south of BRSF, may be audible at
13 BRSF, particularly when large high-explosives munitions are detonated. Munitions noise
14 becomes a less significant part of the noise environment in portions of BRSF farther from
15 Eglin Range.

16 **5.3.2 Environmental Consequences**

17 As discussed in Section 3.3, adverse impacts may potentially occur from UoEX and aircraft
18 operations. Other Proposed Action effectors are not addressed in this section.

19 [Figure 5-11](#) through [Figure 5-20](#) show the noise protection levels associated with noise-
20 generating operations at BRSF. Aircraft and ground vehicles would follow variable routes to
21 and from training locations in the state forest. Aircraft en route typically operate at or above
22 500 feet AGL unless operating within existing SUA. Areas outside the state forest would
23 occasionally experience aircraft and surface vehicle noise at levels listed in [Table 3-9](#) and
24 [Table 3-13](#) generated by vehicles en route. However, because routing would vary from one
25 training mission to the next, overflight/pass-by of any given location would be infrequent,
26 and noise impacts outside the state forests would be minimal.

27 **5.3.2.1 Air Operations**

28 At BRSF, as many as nine sorties per annual average day would be conducted as part of LAPT,
29 LLHI/E, AD, A/LVL, and OHO training. Each training event could include up to four aircraft but
30 only one or two under normal circumstances. The experience of a person on the ground
31 would vary depending on the person's location relative to the training location and the
32 mission being conducted. In general, one or more aircraft would maneuver to the training
33 location using variable routing at not less than 500 feet AGL. On nearing an HLZ/DZ, the
34 aircraft would descend along a pre-approved flight, avoiding known noise-sensitive locations
35 by at least 200 feet. Maneuvers and any additional approaches to the HLZ/DZ would also
36 avoid known noise-sensitive locations by 200 feet. Training, including maneuver, approaches,
37 and hover, would typically last 2 hours or less. About 20 percent of total annual operations
38 would occur at least partially after 10:00 PM, with the majority of these late-night operations
39 taking place in summer months when the sun sets later. HLZ/DZs would be sited in locations
40 greater than 2,200 feet from known noise-sensitive locations to minimize the likelihood of
41 direct overflights of people at low altitudes. Operations noise, whether it is generated by a
42 direct overflight or training at a distance, could be disruptive of activities (e.g., conversation,

1 sleeping) and could be considered annoying. Several HLZ/DZs would be established, and any
 2 given training locations would be used for less than one training event per day on average.
 3 Under a conservative set of assumptions, which are described in Section 3.3.3 and in more
 4 detail in Appendix H (Section H.3), noise levels exceeding 55 dB DNL would not affect any
 5 known noise-sensitive locations. Several aircraft currently operating in the airspace above
 6 BRSF, such as the A-10 and F-35, generate noise levels higher than those typically generated
 7 by aircraft that would be involved in GLI training. Military aircraft, such as the F-35, do not
 8 normally fly over BRSF at levels below 1,000 feet AGL (the floor altitude of Eglin MOAs) except
 9 in R-2915. Table 5-6 compares baseline aircraft and those proposed under the GLI.

10 The Munson/Blackwater and BRSF TA-1 FWALS would support A/LVL training, and noise
 11 generated by that training was included with LAPT training noise for purposes of analysis.
 12 Operations by rotorcraft such as the CV-22 are generally louder than light propeller-driven
 13 aircraft, and the full spectrum of HLZ/DZ training would only be conducted at locations that
 14 are relatively remote from known noise-sensitive locations (e.g., TA-1 and the northern
 15 half of the Munson/Blackwater Airstrip). At the
 16 Munson/Blackwater airstrip, GLI training
 17 aircraft would arrive from the north and depart
 18 toward the north to avoid overflight of the Krul
 19 Lake Recreation Area, which includes a
 20 campground. Takeoff roll would be initiated
 21 from approximately midfield to minimize noise
 22 impacts to the campground. DNL noise
 23 contour maps reflecting these scenarios are
 24 shown in Figure 5-22 through Figure 5-24. At
 25 the Munson/Blackwater Airstrip, light aircraft
 26 currently make approaches and departures
 27 without operational restrictions, although these operations occur almost entirely during
 28 daytime hours.
 29

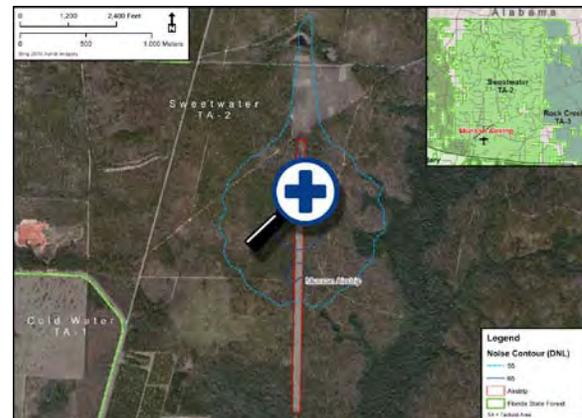


Figure 5-22. BRSF Proposed FWALS DNL-Munson Airfield



Figure 5-23. BRSF Proposed FWALS DNL-TA-9



Figure 5-24. BRSF Proposed FWALS DNL-TA-1

1 **Table 5-6. Comparative SEL Under the Flight Track for Representative Aircraft Types at BRSF**

Aircraft Category	Aircraft type	SEL in dB ¹			Power	Speed (kts)
		500 feet AGL	1,000 feet AGL	10,000 feet AGL		
Aircraft types to be used in GLI training (also currently fly in existing SUA over BRSF)	2-engine, propeller-driven ²	84	79	62	100% RPM	200
	CV-22	94	90	72	60 degrees nacelle tilt	150
	H-60	91	87	N/A	LFO Lite 140 kts	140
	C-130H	95	90	67	800 CTIT	180
	H-47	87	82	60	Flyover at 120 kts	120
Aircraft types operating in SUA over BRSF (not involved in GLI)	F-35A ³	127	120	94	95% ETR	475
	A-10	97	91	55	5333 NF	325
	Single-engine, Propeller-driven Aircraft	84	79	61	70% RPM	160
	UH-1 (FFS and others)	96	91	73	100% RPM	80
	T-6	98	93	73	100% engine torque	160

AGL = above ground level; BRSF = Blackwater River State Forest; CTIT = turbine inlet temperature in degrees Celsius; ETR = engine thrust request; GLI = GRASI Landscape Initiative; hp = horsepower; kts = knots; LFO Lite 200 kts = helicopter in level flight at 200 knots; NF = fan speed; SUA = special use airspace; RPM = revolutions per minute

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. C-23 Sherpa used as surrogate noise source for various small, propeller-driven aircraft types involved in GLI; C-23 is powered by two 1,198-hp engines, while CASA-212, PC-12, and M-28 are powered by pairs of 900-hp, 850-hp, and 1,100-hp engines, respectively.

3. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010).

2 GLI aircraft approaching and departing from FWALS in TA-9 would overfly privately owned
3 parcels at altitudes below 500 feet AGL. Noise levels generated during LAPT would not be
4 expected to exceed 95 dB SEL (see [Table 3-10](#)). Operations would be relatively infrequent,
5 and the noise levels at privately owned parcels would not exceed 55 dB DNL_{mr}.

6 **5.3.2.2 Munitions Use**

7 At BRSF, firing of blank rounds and ground burst simulators would only take place at the STOP
8 Camp and the SRYA. Paintball/plastic pellets and smoke grenades would be used at other
9 locations, but use of these expendables generates minimal noise.

10 The former STOP Camp is located 1,650 feet from the nearest privately owned land and about
11 1,900 feet from the nearest structure visible on available aerial photos. The SRYA is located
12 about 1,350 feet from the nearest privately owned land parcel and about 5,000 feet from the
13 nearest structure visible in available aerial photos. The noise generated by blank rounds may
14 be alarming to residents living on privately owned parcels and transient users of BRSF,
15 particularly if it occurs outside of hunting season or at night. The extent of noise from firing
16 blank rounds is shown in [Figure 5-11](#) through [Figure 5-20](#) and would exceed threshold levels
17 at known noise-sensitive locations (i.e., residences). Detonation of ground burst simulators
18 would be expected to be disturbing and possibly alarming to people nearby. To avoid

1 unnecessary concern among local residents, the Air Force would notify adjacent residents of
2 any upcoming training events that use munitions.

3 **5.3.2.3 Ground Vehicle Operations**

4 As discussed in Section [3.3.3](#), ground vehicle operations (e.g., CCVM, VSWC, BD, and OFVO)
5 may generate noise that is annoying to people in the state forest or private inholdings,
6 particularly when it occurs at night. Noise levels generated by two of the loudest vehicles
7 expected to be used during GLI training are listed in [Table 3-13](#). Ground vehicles used in GLI
8 training would be equipped with exhaust mufflers in compliance with Florida Statutes.
9 Training would occur along roads that are used currently by heavy trucks (e.g., logging trucks)
10 and other traffic. Noise impacts would be localized to the area where ground vehicles are
11 operating and would be limited to the duration of the training event.

12 **5.3.2.4 Amphibious Operations**

13 AO would involve up to six watercraft equipped with motors up to 200hp. These boats would
14 generate noise that could be considered disruptive and annoying by people along the banks
15 of the water body being used. The boats would be of a similar size and engine power to
16 boats currently used on the same waterbodies, and would not be expected to exceed noise
17 level thresholds established in Florida Statutes. During covert training operations in confined
18 water bodies, full throttle would be expected to be used rarely, limiting the intensity of noise
19 generated. This type of training could occur up to 10 times per year in waterbodies where
20 motor-powered boats are currently permitted. Noise impacts would be expected to be
21 temporary, lasting the duration of the training exercise.

22 **5.3.3 Noise Impact Summary**

23 [Table 3-7](#) describes the context, intensity, and duration factors utilized in analysis of impacts
24 to noise receptors; based on these factors the Air Force has identified some insignificant
25 noise-related impacts to public health and safety and the human and natural environment.
26 Noise associated with aircraft operations and munitions use would result in annoyance
27 associated with activity interference to some recreational users and residences. Given the
28 context of the BRSF existing noise environment and intensity of potential noise levels
29 resulting from the Proposed Action, noise levels would not be sufficiently intense to exceed
30 recommended guidelines. As a result, adverse impacts associated with annoyance (e.g.,
31 hearing loss) for those people not participating in the training can be expected. People
32 involved in training would wear hearing protection as required by DoD regulations. Activities
33 such as munitions training and aircraft operations are either not regulated or are specifically
34 exempt from local noise regulations. Ground vehicles and watercraft used during GLI training
35 would be expected to generate noise levels below thresholds established in Florida Statutes.
36 Implementation of operational constraints identified in Section [2.5](#), as well as Proposed
37 Resource-Specific Mitigations in the previous analysis, would minimize potential noise
38 annoyance and, in most cases, minimize noise to a negligible level.

1 [Table 5-7](#) summarizes the impacts identified. Impacts are categorized as follows:

- 2 • Adverse (yellow)
- 3 • Neutral/no effect (green)

4 **Table 5-7. Noise Impact Summary – BRSF**

Training Event	Training Location								
	Distributed Ops	Munson/ Blackwater Airstrip	TA – 1 FWALS	TA-9 FWALS	Nominal HLZ/DZ	Nominal OHO Location	STOP Camp	SRYA	Nominal Ground Vehicle Training Location
Land Disturbance	1	N/A	N/A	N/A	N/A	N/A	1	1	N/A
Ground Movement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Use of Expendables	N/A	N/A	N/A	N/A	N/A	N/A	3	3	N/A
Aircraft Operations	4	5	5	5	5	5	N/A	N/A	N/A

DZ = drop zone; HLZ = helicopter landing zone; N/A = not applicable; OHO = overwater hoist operations; Ops = operations; STOP = Short-Term Offender Program; SRYA = Santa Rosa Youth Academy; TA = tactical area

1. Localized, short-term, and low-intensity noise.
2. Localized, short-term, individual wheeled vehicle noise events may be annoying to residents and transient users.
3. Localized, recurring events over long term. Munitions noise thresholds exceeded at known noise-sensitive locations (residences), and management actions are needed to reduce level of impacts to what would be expected to be perceived as moderate.
4. Aircraft maneuver noise affects wide area; recurring events; minimum altitude applied to reduce impacts to levels expected to be considered moderate.
5. Aircraft affects localized area; recurring events; noise thresholds are exceeded and measures must be applied during site selection and mission planning to reduce impacts to levels expected to be moderate.

5 5.3.4 Proposed Resource-Specific Mitigations

6 In addition to the mitigations for noise identified in Section [3.3.4](#), the following BRSF-specific
7 noise mitigations would further minimize noise impacts. While noise impacts can be
8 minimized, they cannot be completely avoided, due to the transient nature of training
9 activities and recreational users, and the varying perception of annoyance among members
10 of the public:

- 11 • A/LVL training would not be conducted at the proposed FWALS in TA-9, and aircraft
12 inbound to and outbound from the FWALS would avoid overflying privately owned
13 parcels with residential structures where practicable.
- 14 • Approaches to and departures from the FWALS in TA-2 (Munson Airstrip) would be
15 conducted from/to the north to avoid low overflight of a campground.

- 1 • Aircraft departing Munson/Blackwater would initiate takeoff roll from about the center
- 2 point of the airstrip.
- 3 • The Air Force would notify residents within 4,000 feet of the SRYA or former STOP
- 4 Camp prior to use of munitions.

5 [Figure 5-11](#) through [Figure 5-20](#) show the areas in which training activities would be
 6 restricted based on buffer distances described above and in Section [3.3.4](#). Buffers would be
 7 established for all privately owned parcels containing at least one residential structure and all
 8 campgrounds.

9 5.4 SAFETY

10 5.4.1 Affected Environment

11 The affected environment for safety as it relates to proposed activities comprises the policies
 12 and procedures currently in place at Eglin AFB, previously discussed in Sections [3.4.2](#)
 13 and [3.4.3](#). The BFC of the FFS is primarily responsible for emergency or fire response at BRSF.
 14 The BFC is also responsible for prevention, detection, and suppression of wildfires, as well as
 15 responding to other emergencies at BRSF, such as accidents. The BFC encompasses Escambia,
 16 Santa Rosa, and Okaloosa Counties.

17 Since January 2010, on average there have been 126 wildfires annually caused by various
 18 sources such as campfires, debris burning, lightning, and children at BRSF ([Table 5-8](#)). Of
 19 those, only about six were caused by equipment/vehicle use.

20 **Table 5-8. Average Wildfires by Cause at BRSF**

Cause	Fires Total	Fires Annual Average	Acres Total	Acres Annual Average
Campfire	9	2.2	130.4	32.6
Children	25	6.2	159.5	39.9
Debris burn, authorized	88	22	2,048.8	512
Debris burn, nonauthorized	63	15.7	276.9	69.3
Equipment use	24	6	600.6	150
Miscellaneous	38	9.4	570.4	142.7
Fireworks	7	1.8	52.4	13.1
Power lines	11	2.8	44.2	11
Incendiary	83	20.8	1,426.00	356.5
Lightning	43	10.8	416.8	104.2
Smoking	6	1.5	285.2	71.3
Unknown	106	26.5	1,552.80	388.2
Total	503	125.7	7,564	1,890.8

Source: FFS, 2013a

1 To respond to potential fires, BFC has 29 forest rangers and senior forest rangers that are
2 certified wildland firefighters in the three-county area. BFC also has 5 primary certified
3 wildland firefighter supervisors and an additional 12 certified wildland firefighters to assist in
4 suppressing and managing wildfires in the district. All certified personnel can be utilized for
5 suppressing wildfires at BRSF.

6 BFC firefighting equipment includes 14 John Deere 650 bulldozers (Type 2) with plows and 2
7 heavy bulldozers (Type 1 and 2) without plows for wildfire suppression and fire line
8 reinforcement. All bulldozers have an accompanying transport for moving the equipment. In
9 addition, the district has seven Type 6 and two Type 4 wildland engines available for fire
10 response. Specialized equipment available for wildfire use includes a mechanic truck for field
11 repairs, portable fuel tanks, small water tenders, an excavator, and various pickup trucks and
12 sport utility vehicles (SUVs). The FFS also maintains a UH-1 Type II firefighting helicopter
13 located at Whiting Field near Milton. This equipment is available for use or support in fighting
14 wildfires at BRSF.

15 Five facilities are considered primary response locations in the district. Three of those
16 locations are located at BRSF. These locations include the headquarters at Munson, Okaloosa
17 Forestry Station near Blackman, and Coldwater Horse Stables located southwest of Munson.
18 The remaining primary sites are located at Milton and Molino. Secondary sites commonly
19 used during periods of elevated wildfire risk are located in Laurel Hill, Holt, Ensley, and
20 Navarre.

21 To mitigate wildfire risk, BRSF has an aggressive prescribed burning program. Upland forest
22 lands are burned an average of every three to four years. This prevents high accumulations of
23 vegetation that would fuel catastrophic wildfires.

24 The BFC cooperates with local county, state, and federal resources to suppress wildfires in the
25 local area. Cooperative agreements exist at the state and local level to allow paid and
26 volunteer fire departments to assist with wildfire suppression and structure protection. The
27 following fire departments commonly assist with wildfires at BRSF: Berrydale Volunteer Fire
28 Department (VFD), Munson VFD, Blackman VFD, Baker VFD, North Okaloosa VFD, Holt VFD,
29 Harold VFD, East Milton VFD, Skyline VFD, and U.S. Navy Whiting Field Fire Department. Other
30 surrounding fire departments may assist as needed.

31 The FFS also maintains cooperative wildfire assistance agreements with Jackson Guard at
32 Eglin AFB, U.S. Forest Service, FWC, the NFWFMD, and the Longleaf Alliance Ecosystem
33 Support Team. Each organization has a variety of conventional or specialized equipment
34 and/or personnel available for significant wildfire incidents at BRSF. The FFS also has
35 agreements with the Florida Highway Patrol and Florida Department of Transportation to
36 provide road closures and or signage necessary for smoke events on federal and state
37 highways.

38 The FFS monitors weather conditions daily for wildfire planning and burning authorization
39 purposes. The BFC records rainfall at various locations, calculates the National Fire Danger
40 Rating System values daily, and sets fire preparedness levels. The FFS also monitors and
41 estimates the Keetch-Byrum Drought Index (KBDI) and FDI for the state of Florida.

1 **5.4.2 Environmental Consequences**

2 As discussed in Section [3.4](#), potential adverse impacts may occur from wildfire associated with
3 Use of Expendables. Other Proposed Action effectors are not addressed in this section.

4 Impacts to BRSF associated with safety would be the same as those described in Section [3.4](#).
5 The Proposed Action would not negatively affect the ability to provide for safe operation of
6 aircraft or other equipment, nor would it result in uncontrollable safety hazards to military
7 personnel, the public, or property. Implementation of established procedures, as discussed in
8 Sections [3.4.2](#) and [3.4.3](#), would ensure that activities associated with the Proposed Action
9 would not result in significant impacts to safety.

10 At BRSF, campfires are only allowed at designated camp sites, which would not be used by
11 training personnel. However, campfires may potentially be utilized at the hardened camp
12 sites in designated fire pits. No campfires would be utilized in the interstitial areas of BRSF. To
13 minimize the potential for fires caused by the Use of Expendables and general training
14 activities (such as idling vehicles), before a mission begins units would obtain the daily fire
15 danger rating and would coordinate with FFS personnel to ensure that adequate fire
16 response is available, if needed per General Operational Constraints identified in Section [2.5](#).
17 Under Florida law, it is unlawful for any person to set fire to, or cause fire to be set to, any
18 wildlands or to build a campfire or bonfire or to burn trash or other debris within the
19 designated area of a severe drought emergency, unless a written permit is obtained from the
20 division or its designated agent.

21 **5.4.3 Safety Impact Summary**

22 [Table 3-15](#) describes the context, intensity, and duration factors utilized in analysis for
23 impacts to safety; based on these factors the Air Force has identified some insignificant
24 adverse public health and safety impacts to the human and natural environment. There is the
25 potential for wildfire associated with training activities, and wildfires could result in adverse
26 impacts. However, requirements identified in Section [2.5](#) associated with wildfire prevention
27 and response would minimize the potential for this impact to occur. Therefore, based on the
28 context, intensity, and duration of identified potential safety impacts, the Air Force has not
29 identified any significant safety impacts. [Table 5-9](#) summarizes the impacts identified.
30 Impacts are categorized as follows:

- 31 • Adverse (yellow)
- 32 • Neutral/no effect (green)

1

Table 5-9. Safety Impacts Summary – BRSF

Proposed Action Effector	Safety Receptor Type (Applies to All BRSF TAs)	
	Military Personnel	General Public
Land Disturbance		
Land development	The Air Force has not identified any adverse safety impacts associated with these activities (see Section 3.4).	
Point impact		
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Dismounted maneuver	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Use of Expendables		
Blanks/GBS	The Air Force has not identified any adverse safety impacts associated with these activities (see Section 3.4).	Risk of wildfire is increased due to Use of Expendables (GBSs at the hardened camp sites, smoke grenades, generators, etc.), which could affect the safety of the general public. However, GBS use would be restricted to hardened camp sites, thus reducing wildfire potential due to low fuel load associated with improved grounds, and the increase in potential wildfires caused by idling vehicles and other equipment would be negligible. While the risk of wildfire is unavoidable under the Proposed Action, General Operational Constraints, as well as fire management procedures implemented by both Eglin AFB personnel and the FFS, would serve to minimize this potential (see Section 5.4.2).
Smoke grenades		
Other/equipment		
Aircraft Operations	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Amphibious Operations	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Utilities	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	

AFB = Air Force Base; BRSF = Blackwater River State Forest; FFS = Florida Forest Service; GBS = ground burst simulator; TA = tactical area

2 **5.4.4 Proposed Resource-Specific Mitigations**

3 All constraints and mitigations, mainly associated with wildfire prevention, are identified in
 4 Section 3.4.3. While these would minimize the potential for wildfire probability, the potential
 5 for increased wildfires cannot be completely avoided under the Proposed Action. Thus, the
 6 potential for adverse safety impacts at BRSF remains. The increased potential for wildfire
 7 probability can only be avoided through implementation of the No Action Alternative.

5.5 AIR QUALITY

5.5.1 Affected Environment

BRSF is located in both Santa Rosa and Okaloosa Counties. Both counties are in attainment for all criteria pollutants (USEPA, 2013).

Baseline emissions for Okaloosa and Santa Rosa Counties are presented in [Table 5-10](#). These emissions data were acquired from the USEPA's 2008 NEI data for Okaloosa and Santa Rosa Counties (USEPA, 2012). The county data include emissions data from point sources, area sources, and mobile sources.

Table 5-10. Baseline Emissions Inventory for Okaloosa and Santa Rosa Counties

County	Pollutant (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Okaloosa	66,216	8,164	6,124	2,889	297	46,912	2,174,195
Santa Rosa	51,160	6,663	7,842	2,795	696	45,154	1,387,334

Source: USEPA, 2013

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

5.5.2 Environmental Consequences

As discussed in Section [3.5](#), potential adverse impacts to air quality may occur from land development activities, use of wheeled vehicles and expendables, and aircraft and AO. Other Proposed Action effectors are not addressed in this section.

All activities proposed at BRSF already occur at Eglin AFB, which is located in Okaloosa and Santa Rosa Counties. Emissions for these activities are currently reported in the Eglin AFB air emissions inventory and GHG inventory. The Proposed Action would involve moving the activities within the current affected county. Emissions from each training activity were compared with county emissions and impacts were determined.

Emissions for land disturbance and fugitive dust for each training activity are provided in Section [3.5](#). These emissions would cause negligible (less than 5 percent of the ROI emissions) short-term impacts to regional air quality ([Table 5-11](#) and [Table 5-12](#)).

Wheeled vehicle emissions associated with each training activity are provided in Section [3.5](#). Vehicles operating in the ROI would emit negligible short-term levels of air pollutants ([Table 5-13](#)). GHG and air pollutant emissions would not exceed thresholds for significant negative impacts.

Table 5-11. Air Emissions from Land Clearing Compared with the ROI

Source	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO ₂ e
Land disturbance	<0.01	<0.01	28.6	<0.01	<0.01	<0.01	<0.01
BRSF ROI	117,376	14,827	13,966	5,684	993	92,066	3,561,529
% Emissions of ROI (year)	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	0.00%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO₂e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

Table 5-12. Fugitive Dust Emissions Compared with the ROI

Fugitive Dust Emissions	PM (tons/event)	PM (tons/year)
Total	6.66	46.11
BRSF ROI		5,684
% Emissions of ROI (year)		0.81%

BRSF = Blackwater River State Forest; PM = particulate matter; ROI = region of influence

Table 5-13. Wheeled Vehicle Air Emissions Compared with the ROI

Vehicle Air Emissions	Emissions (tons)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO ₂ e
Total/Year	32.03	6.26	1.32	1.42	0.48	31.51	748.18
BRSF ROI	117,376	14,827	5,684	13,966	993	92,066	3,561,529
% Emissions of ROI (year)	0.03%	0.04%	0.02%	0.01%	0.05%	0.03%	0.02%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO₂e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

Training munitions emissions are provided in Section 3.5. Table 5-14 summarizes emissions from use of training munitions. The emissions calculated were for all proposed munitions, even though at BRSF only GBSs and smoke grenades would be utilized. As a result, air emissions at BRSF resulting from training munitions use would be substantially less than those provided in Table 5-14, resulting in only a small percentage of the total emissions per year. Even if all training munitions were utilized at BRSF, there would still be only a negligible impact on air quality.

Table 5-14. Training Munitions Emissions Compared with the ROI

Munitions Emissions	Emissions (tons)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO ₂ e
Maximum emissions/year	0.18	0.02	0.75	0.21	0.00	0.00	0.35
BRSF ROI	117,376	14,827	13,966	5,684	993	92,066	3,561,529
% Emissions of ROI	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO₂e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

1 Aircraft emissions are provided in Section 3.5. [Table 5-15](#) summarizes emissions from aircraft
 2 operations for the different types of activities. Emissions would have a negligible impact to
 3 regional air quality.

4 **Table 5-15. Aircraft Emissions Compared with the ROI**

Source	Emissions (tons)						
	CO	NO _x	PM _{2.5}	PM ₁₀	SO ₂	VOCs	CO _{2e}
Total/Event	0.63	3.97	0.67	0.75	0.70	8.13	73.69
Total/Year	62.96	139.28	33.03	38.36	10.51	11.84	13,488
BRSF ROI	117,376	14,827	5,684	13,966	993	92,066	3,561,529
% Emissions of ROI (year)	0.05%	0.94%	0.58%	0.27%	1.06%	0.01%	0.38%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides;
 PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or
 less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

1. Total annual emissions were compared with the ROI for maximum impact analysis.

5 AO emissions are provided in Section 3.5. Emissions from such sources would have
 6 negligible, short-term impacts to regional air quality ([Table 5-16](#)).

7 **Table 5-16. Amphibious Operations Emissions Compared with the ROI**

Source	Emissions (tons)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
AO/event	0.00	0.00	0.00	0.00	0.05	0.44	0.00
AO/year	0.01	0.01	0.00	0.01	0.48	4.42	0.00
BRSF ROI	117,376	14,827	5,684	13,966	993	92,066	3,561,529
% Emissions of ROI (year)	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%

AO = Amphibious Operations; BRSF = Blackwater River State Forest; CO = carbon monoxide; CO_{2e} = carbon dioxide
 equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate
 matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic
 compound

8 **5.5.3 Air Quality Impact Summary**

9 [Table 3-18](#) describes the context, intensity, and duration factors utilized in impact analysis for
 10 air quality; based on these factors the Air Force has not identified any adverse air quality
 11 impacts to public health and safety or the human and natural environment. In summary,
 12 training activities would result in small amounts of air emissions that would not result in
 13 exceedence of any local or regional air quality standards. While NO_x emissions associated
 14 with aircraft operations may be considered adverse, given the potential increase over
 15 baseline air quality conditions, these emissions would be transient and short term in nature.

16 [Table 5-17](#) summarizes the impacts identified. Impacts are categorized as follows:

- 17 • Adverse (yellow)
- 18 • Neutral/no effect (green)

Table 5-17. Air Quality and Greenhouse Gas Impact Summary - BRSF

Proposed Action Effector	Air Quality/Greenhouse Gases (% ROI Emissions)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Land Disturbance	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	0.00%
Ground Movement	0.03%	0.04%	0.02%	0.01%	0.05%	0.03%	0.02%
Use of Expendables	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Aircraft Operations	0.05%	0.94%	0.27%	0.58%	1.06%	0.01%	0.38%
Amphibious Operations	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%
Total % of ROI Emissions	0.08%	0.98%	0.51%	0.59%	1.15%	0.05%	0.40%

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

5.5.4 Proposed Resource-Specific Mitigations

In the absence of any identified adverse impacts, no Resource-Specific Mitigations for air quality have been identified.

5.6 EARTH RESOURCES

5.6.1 Affected Environment

This section describes the geologic and soil resources within the BRSF. Discussion focuses on impact assessment resource features and issues identified in Section 3.6, *Earth Resources*.

5.6.1.1 Geologic Resources

The following subsection discusses the physical geography and closed depressions subsidence features on BRSF.

Physical Geography

The Blackwater River watershed that generally defines the BRSF landscape is characterized by alluvial and fluvial terraces and the Citronelle Formation. Stream terraces form as one or a series of constructed and/or erosional flat-topped landforms in a stream valley that flank and are parallel to the stream channel originally formed by the previous stream level. Subsequent terraces, which may rarely or never flood, are built on the remnants of abandoned floodplain, streambed, or valley floor features (Schmidt and Coe, 1978; USDA, 1994; Hollie et al., 2010).

The Citronelle Formation is a deltaic deposit up to 340 feet thick consisting of quartz sands and gravel that are unconsolidated to poorly consolidated, very fine to very coarse, and clean to clayey. It frequently contains extremely hard cemented sandstone lens known as hardpans, which form as a result of cementation of sands by iron oxides that precipitate from groundwater. In some instances, seepage slopes and natural ponds are created by hardpans

1 at or near the surface. As currently recognized, this formation only occurs in the Florida
2 panhandle (Beck, 1973; Hollie et al., 2010; Maddox et al., 2002; Marsh, 1966).

3 **Sensitive Karst Terrain**

4 No sensitive karst terrain areas have been identified on BRSF (see Section [3.6.1.2](#)).

5 **Closed Depressions**

6 There are several closed depression areas that may or may not represent sinkhole subsidence.
7 BRSF areas designated as closed depressions are likely nonkarst features relating to other
8 natural geologic features or conditions created by human activities, such as buried organic
9 materials, broken drain lines, septic tanks, or other subterranean condition. A licensed,
10 professional geologist makes the determination if the subsidence incident is a sinkhole or
11 closed depression. A summary of BRSF closed depression subsidence incidents are listed in
12 [Table 5-18](#) and shown in [Figure 5-25](#). Approximately 54 percent of designated closed
13 depressions are within the Juniper Creek tactical area (TA-8).

14 **Table 5-18. BRSF Closed Depression Subsidence Areas**

Tactical Area (TA)	Closed Depression Subsidence Areas	
	Number	Acres
Coldwater (TA-1)	1	3
Sweetwater (TA-2)	2	15
Rock Creek (TA-3)	1	1
Horse Creek (TA-4)	0	0
West Boundary (TA-5)	2	25
Floridale (TA-6)	5	17
Bone Creek (TA-7)	1	1
Juniper Creek (TA-8)	20	121
Yellow River (TA-9)	5	24
Total	37	207

15 **5.6.1.2 Soil Resources**

16 **Soils Inventory**

17 BRSF geologic formations are the parent materials from which area soils were formed. A
18 preeminent characteristic of the forest's upland soils that is responsible for many of its unique
19 attributes is the broad distribution and, in most cases, dominance of quartz sand. The soil
20 series that compose the BRSF are summarized in [Table 5-19](#) and shown in [Figure 5-26](#).
21 Appendix E, *Earth Resources*, provides detail by tactical area.

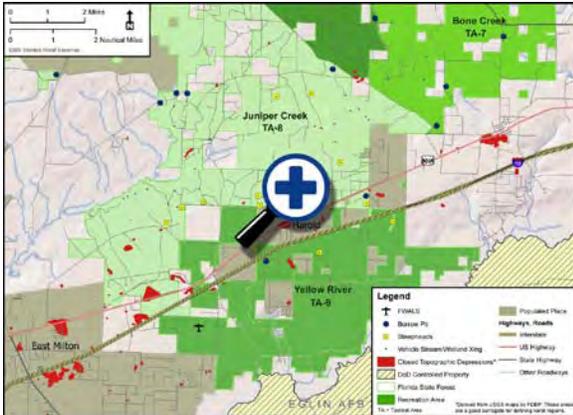


Figure 5-25. BRSF Closed Depressions, Steepheads, and Borrow Pits



Figure 5-26. BRSF Soil Suborders

1

Table 5-19. BRSF Soils Summary

Soil Taxonomy Class	Total (acres)
1 Entisols Soil Order	1
1A Aquents Soil Suborder	1
1B Psammentis Soil Suborder	1
2 Histisols Soil Order	
2A Sapristis Soil Suborder	2
3 Inceptisols Soil Order	
3A Aquepts Soil Suborder	3
4 Spodosols Soil Order	
4A Aquods Soil Suborder	4
5 Ultisols Soil Order	5
5A Aquults Soil Suborder	5
5B Udults Soil Suborder	5

2 Approximately 23 percent of the BRSF soil series are classified as hydric soils and
 3 approximately 20 percent (40,068 acres) of forest land area is designated as hydric. The
 4 majority of forest hydric soils occur along stream valleys and floodplains ([Table 5-20](#) and
 5 [Figure 5-27](#)).

6

Table 5-20. BRSF Hydric Soils

Tactical Area (TA)	Hydric Soils (acres)	Percent of TA
Coldwater (TA-1)	7,374	21
Sweetwater (TA-2)	4,963	14
Rock Creek (TA-3)	7,620	23
Horse Creek (TA-4)	2,379	21
West Boundary (TA-5)	2,807	17
Floridale (TA-6)	3,138	13
Bone Creek (TA-7)	4,774	30
Juniper Creek (TA-8)	4,121	18
Yellow River (TA-9)	2,892	24
Total	40,068	—

Prime Farmland Soils

Prime farmland soils found on BRSF are listed in [Table 5-21](#). Approximately 25 percent (50,267 acres) of forest soils are classed as prime farmland; Coldwater (TA-1) contains the greatest amount of prime farmland soils.

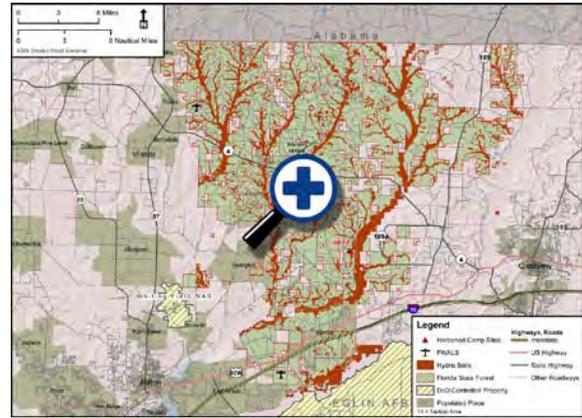


Figure 5-27. BRSF Hydric Soils

Table 5-21. BRSF Prime Farmland Soils

Tactical Area (TA)	Acres ¹	Percent of TA
Coldwater (TA-1)	16,085	47
Sweetwater (TA-2)	7,295	20
Rock Creek (TA-3)	7,116	22
Horse Creek (TA-4)	2,887	25
West Boundary (TA-5)	5,352	33
Floridale (TA-6)	7,790	32
Bone Creek (TA-7)	1,626	10
Juniper Creek (TA-8)	2,116	9
Yellow River (TA-9)	0	0
Total	50,267	—

1. Total area does not include borrow pits, water, urban lands, Aquents, gullied lands, and other variants.

Soil Erosion

Erodible Soils

The highly erodible and potentially highly erodible soils found on BRSF are presented in [Table 5-22](#) and shown in [Figure 5-28](#). Approximately 112,755 acres (55 percent) of the BRSF is composed of highly erodible soils.

Generally, BRSF soils are considered very susceptible to soil erosion due to the dominance of sandy soil textures and extensive areas of moderately to steeply sloped topography.

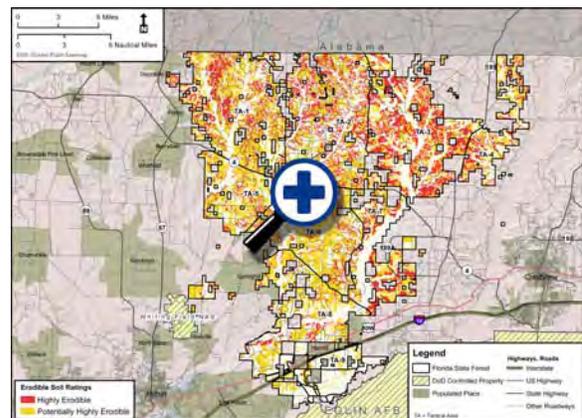


Figure 5-28. BRSF Highly Erodible and Potentially Highly Erodible Soils

1

Table 5-22. BRSF Erodible Soils

Tactical Area (TA)	Erodible Soils (acres)		Total Area ¹
	Highly Erodible	Potentially Highly Erodible	
Coldwater (TA-1)	7,304	14,361	21,665
Sweetwater (TA-2)	8,402	11,821	20,223
Rock Creek (TA-3)	11,387	7,890	19,277
Horse Creek (TA-4)	2,540	3,773	6,313
West Boundary (TA-5)	1,986	7,699	9,685
Floridale (TA-6)	2,981	11,936	14,917
Bone Creek (TA-7)	3,582	4,643	8,225
Juniper Creek (TA-8)	1,703	8,843	10,546
Yellow River (TA-9)	183	1,721	1,904
Total	40,068	72,687	112,755

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

2 **Natural Soil Erosion Sources**

3 Streambanks

4 BRSF streambank habitats are generally divided into three categories: (1) banks with
 5 vegetation and leaf litter 2 to 10 feet high, (2) clay lens with vegetation, and (3) small sand
 6 banks with trailing grasses (Peters and Jones, 1973). A study conducted by the FDEP within
 7 the BRSF documented channel segments of the Blackwater River with severe erosion (Ray,
 8 1999). In several instances, banks were observed to exhibit unstable overheightened and
 9 oversteepened conditions leading to mass slope failure (see Streambank Erosion photos). No
 10 site-specific BRSF streambank erosion data were available.



Blackwater River Bendway Streambank Erosion (Photos by Donald Ray)

11 Steepheads

12 The 11 steepheads within the BRSF are listed in [Table 5-23](#) and shown in [Figure 5-25](#). Eighty-
 13 two percent of BRSF steepheads are within the Juniper Creek tactical area (TA-8).

Table 5-23. BRSF Steepheads

Tactical Area (TA)	Number of Steepheads
Juniper Creek (TA-8)	9
Yellow River (TA-9)	2
Total	11

Accelerated Soil Erosion Sources**Borrow Pits**

On BRSF, there are 46 borrow pits (ranging from less than an acre to several acres in size) classified as active, inactive (abandoned), or reclaimed (Table 5-24 and Figure 5-25). Borrow pits are potential sources of severe soil erosion and sedimentation, due to their state of perpetual surface disturbance, bare surface conditions, common location in proximity to waterways, accumulations of loose soil materials, and exposure of relatively impervious soil layers (see photo of Sweetwater Borrow Pit-Induced Gully Erosion and Post-Reclamation Conditions). BRSF pits are stabilized and restored to native vegetation once mining operations have ceased (Hollie et al., 2010).

Table 5-24. BRSF Borrow Pits

Tactical Area (TA)	Borrow Pits (Number)			Total
	Active	Inactive	Reclaimed	
Coldwater (TA-1)	2	4	—	6
Sweetwater (TA-2)	2	8		10
Rock Creek (TA-3)	4	4	1	9
Horse Creek (TA-4)	—	3	—	3
West Boundary (TA-5)		3		3
Floridale (TA-6)		1	3	4
Bone Creek (TA-7)	3	1	1	5
Juniper Creek (TA-8)	2	3	—	5
Yellow River (TA-9)	1	—		1
Total	6	27	0	46



BRSF Sweetwater Borrow Pit-Induced Gully Erosion and Post-Reclamation Conditions (Photos by Donald Ray)

1 [Unpaved Roads and Crossings](#)

2 On BRSF, unpaved roads are highly susceptible to soil erosion due to the geologic formations,
 3 soils, topography, and climate that characterize this forest and the type of maintenance
 4 performed on these unpaved roads (i.e., grading). Soils detached from roads and roadside
 5 areas are readily discharged into waterways at crossings (see photos of Unpaved Road
 6 Erosion and Wetland Sedimentation and Coon Camp Branch Low-Water Crossing-Induced
 7 Soil Erosion and Sedimentation). Studies by FDEP have confirmed that unpaved roads and
 8 crossings are primary sources of soil erosion and sedimentation in water resources on BRSF
 9 (Ray, 1996; Ray, 2005a; Ray, 2005b).



BRSF Unpaved Road Erosion and Wetland Sedimentation (Photos by Donald Ray)



BRSF Coon Camp Branch Low Water Crossing-Induced Soil Erosion and Sedimentation (Photos by Donald Ray)

10 Routine maintenance of primary, secondary, and some tertiary unpaved roads on BRSF is
 11 primarily conducted by the Santa Rosa and Okaloosa County road maintenance departments.
 12 Most improved roads are surfaced with clayey sand materials to improve surface cohesion
 13 and stability. Maintenance of these roads is conducted in compliance with the forest road
 14 standards described in the Road and Bridge Plan (FDACS, Division of Forestry, Policies and
 15 Procedures 500.108) and silviculture BMPs manual (FDACS, 2008) developed by FDACS,
 16 Division of Forestry (FDACS, 2007).

1 Based on available data, most BRSF unpaved road water crossings are low water crossings
 2 (see [Table 5-25](#) and the photos of the Mare Branch Unpaved Tertiary Road Low Water
 3 Crossing). The BRSF is currently discriminating the locations of non-crossing road drains and
 4 crossing culverts therefore a complete culvert crossings dataset is not available. Low water
 5 crossings account for approximately 67 percent of unpaved road crossings. A summary of
 6 BRSF unpaved road bridge and low-water crossings is presented in [Table 5-25](#). In most cases,
 7 low water crossings are unimproved; however, based on the stream flow conditions and
 8 trafficking loads and frequency reinforcing, materials such as rock or geo-web materials may
 9 be required to reduce in-stream, streambank, and road approach disturbances. Between
 10 FY 07–08 and FY 11–12, 32 low water crossings were improved (FDACS, 2013).

11

Table 5-25. BRSF Unpaved Road Crossings

Tactical Area (TA)	Number of Crossings		Total
	Bridge	Low Water	
Coldwater (TA-1)	21	39	60
Sweetwater (TA-2)	14	18	32
Rock Creek (TA-3)	20	54	74
Horse Creek (TA-4)	7	7	14
West Boundary (TA-5)	3	31	34
Floridale (TA-6)	9	16	25
Bone Creek (TA-7)	11	5	16
Juniper Creek (TA-8)	8	17	25
Yellow River (TA-9)	0	0	0
Total	93	187	280

**BRSF Mare Branch Unpaved Tertiary Road Low Water Crossing**

(Photos by Donald Ray)

12 Temporary logging roads also occur on BRSF (see Clearcut Logging Road photo). These
 13 roads, which are not included on the roads inventory, are used to collect and remove
 14 harvested timber from the site. In most cases, these native-soil roads are not built to road
 15 class standards and are abandoned once harvesting operations cease. Generally, these roads
 16 are restored via natural attenuation. Since these roads are not designed for continued use by
 17 wheeled-vehicles, they easily degrade and may be highly susceptible to soil erosion. In
 18 addition, firebreaks are also not designed to support continued use by motor vehicles.

1 **5.6.2 Environmental Consequences**

2 As discussed in Section [3.6](#), potential adverse
3 impacts to earth resources may occur from
4 land development activities, use of wheeled
5 vehicles and dismounted movement, and
6 aircraft and AO. Other proposed action
7 effectors are not addressed in this section.

8 **5.6.2.1 Land Disturbance**

9 As discussed in Section [3.6.3](#), HLZs/DZs, point
10 impacts, consumption, and incidental land
11 disturbance would have no adverse impact on
12 soils. Impacts to BRSF earth resources
13 identified in Section [5.6.1](#) would generally be
14 the same as those described in Section [3.6](#).



BRSF Clearcut Logging Road

(Photo by Greg Kesler)

15 **Fixed-Wing Aircraft Landing Sites**

16 The Munson Airfield is an existing airstrip in the Sweetwater TA (TA-2) that has been
17 designated for public use with no restrictions. The other two fixed-wing aircraft landing
18 locations would utilize existing unpaved roads in Coldwater and Yellow River TAs (TA-1 and
19 TA-9, respectively) (see Appendix A, *Printable Maps*, [Figure 2-8](#) through [Figure 2-10](#)).

20 No field-validated data on the existing features and conditions of the proposed unpaved road
21 FWALS locations were available for comparison with military FWALS standards. Based on data
22 collected from the FFS, the widths of forest unpaved roads shoulder to shoulder and
23 stabilized aggregate/clay base range from 34 to 22 feet and 12 to 24 feet, respectively.
24 Current primary, secondary, and tertiary unpaved roads at BRSF likely provide less than the
25 30 feet of usable landing surface required by military standards.

26 Based on field experience, most BRSF unpaved roads likely do not have shoulder areas and
27 are maintained at a maximum road width. Where shoulders do exist, they are generally not
28 constructed or maintained to a standard that would support vehicle traffic. Based on a review
29 of aerial photographs, the proposed Yellow River site would occur on an unimproved, tertiary
30 sand road that is restricted for use as an FWALS without major reconstruction. The proposed
31 Coldwater Creek site may be an improved secondary road but may be flanked on both sides
32 by timber (Zones A and B). Given the road subgrade and surface course, the road surface may
33 require reconstruction to support aircraft landings and bushhogging to clear adjacent
34 vegetation. Bushhogging is a vegetation maintenance mowing procedure performed after
35 standing timber and large, mature shrubs have been removed.

36 *TA-2 Munson Airfield Landings Determination:* Since the Munson Airfield is currently utilized for
37 aircraft operations, it is anticipated that LAPT training conducted at this location would be
38 adverse but insignificant, site specific, low intensity, and short term. No modifications to the
39 existing airfield would likely be required to accommodate proposed aircraft mission activities.
40 Impacts would likely be limited to minor disturbances of maintained areas that could be fully
41 recovered during routine FWALS maintenance. The proposed use of light military aircraft is
42 not anticipated to exceed the surface loading and pressures associated with other aircraft

1 that use the airfield. No loss or degradation of prime farmland soils or geologic steephead or
2 closed depression features is anticipated.

3 *TA-1 and TA-9 Unpaved Road FWALS Landings Determination:* For this analysis, it was assumed
4 that the proposed TA-1 and TA-9 FWALS locations have no road shoulders, are surfaced with
5 unimproved native soils, and have an average roadway driving surface width of 18 feet. To
6 convert these roads into FWALS that meet AFSOC standards (AFSOC, 2011), the existing
7 roadways would have to be rebuilt according to requirements identified in Section [3.6](#),
8 resulting in about 0.6 acres of soil disturbance per FWALS. The estimated FWALS footprint
9 area and impacted soils are presented in [Table 5-26](#).

10 **Table 5-26. BRSF Proposed FWALS Soils and Footprint Area**

Tactical Area (TA)	Soils	Footprint Area (acres/percent)
TA-9 FWALS	Troup loamy sand, 0 to 5 percent slope	10.7/41
	Lakeland sand, 0 to 5 percent slope	6.8/26
TA-1 FWALS	Lucy loamy sand, 0 to 5 percent slope	3.5/13
	Dothan fine sandy loam, 0 to 5 percent slope	4.6/17
	Dothan fine sandy loam, 2 to 5 percent slope	0.8/3

11 [Table 5-27](#) summarizes soil suitability ratings for landing zones of proposed FWALS at BRSF
12 based on USDA ratings provided previously in Section [3.6](#).

13 **Table 5-27. BRSF Unpaved Road FWALS Soil Suitability**

Tactical Area (TA)	Soils	Suitability Rating
TA-9 FWALS	Troup loamy sand, 0 to 5 percent slope	Well Suited
	Lakeland sand, 0 to 5 percent slope	Moderately Suited
TA-1 FWALS	Lucy loamy sand, 0 to 5 percent slope	Well Suited
	Dothan fine sandy loam, 0 to 5 percent slope	
	Dothan fine sandy loam, 2 to 5 percent slope	

14 With the implementation of mitigations specific to earth resources (see Section [3.6.4](#)),
15 potential soil erosion, compaction, and rutting impacts from proposed FWALS development
16 at BRSF are anticipated to be adverse but insignificant, site specific, low intensity, and short
17 term. No loss or degradation of prime farmland, karst soils, geologic steephead, or closed
18 depression features is anticipated. Since no hydric soils were identified within the estimated
19 footprint area, federal or state wetland permits are not likely required.

20 **5.6.2.2 Ground Movement**

21 As discussed in Section [3.6](#), ground movement has the potential for causing soil erosion;
22 however, this potential is considered negligible given general operating procedures
23 identified in Section [2.5](#) and the Proposed Resource-Specific Mitigations identified in
24 Section [3.6.4](#). Based on information provided in Section [3.6](#), BRSF temporary low- and
25 moderate-use camp site suitability and limitation constraint areas are summarized in
26 [Table 5-28](#) and [Figure 5-29](#). BRSF tactical area lands were rated as somewhat limited or very
27 limited for bivouac suitability. Limitations would be less restrictive on sites for tents or
28 remote camps. Areas identified as very limited would not be suitable for bivouacking.

1

Table 5-28. BRSF Bivouac Constraint Areas

Tactical Area (TA)	Constraint Area (acres)		Total Area ¹ (acres)
	Somewhat Limited	Very Limited	
Coldwater (TA-1)	26,804	7,635	34,439
Sweetwater (TA-2)	27,647	8,044	35,691
Rock Creek (TA-3)	17,460	15,279	32,739
Horse Creek (TA-4)	6,391	5,100	11,491
West Boundary (TA-5)	13,165	2,944	16,109
Floridale (TA-6)	19,803	4,462	24,265
Bone Creek (TA-7)	6,003	10,123	16,126
Juniper Creek (TA-8)	14,146	8,218	22,364
Yellow River (TA-9)	2,487	9,463	11,950
Total	133,906	71,268	205,174

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

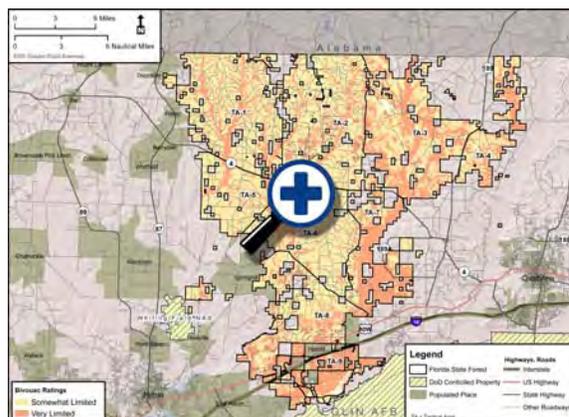
2 Constraint areas where mission impact-
 3 induced earth resource effects are most likely
 4 to occur include closed depressions,
 5 steepheads, and hydric and erodible soils.
 6 Steepheads and closed depressions represent
 7 locations where steep slopes and sustained
 8 wet soil conditions are sensitive to soil
 9 disturbances from troop movements. These
 10 would mostly likely occur during dismounted
 11 maneuvers.

12 As discussed in Section 3.6, no adverse impacts
 13 to off-road areas would occur from wheeled
 14 vehicles. Proposed use of unpaved roads and
 15 crossings could degrade and destabilize unpaved road soil or aggregate surfaces, which
 16 could increase soil erosion and sedimentation. However, the proposed mission frequency as
 17 identified in Chapter 2 would likely not exceed the carrying capacity of available unpaved
 18 roads or be greater than the current level of vehicle use. Vehicles traversing low-water
 19 crossings could destabilize road approach slopes and increase soil erosion. Generally, the
 20 potential sources of sediment are limited to the portions of the road in immediate contact
 21 with the water course and the distance of road slopes from the gradient crest to the stream.
 22 Driving through a stream also mobilizes streambed sediments.

23 However, implementation of General Operational Constraints identified in Section 2.5, along
 24 with implementation of Proposed Resource-Specific Mitigations in Section 3.6.4 would serve
 25 to minimize impacts to earth resources.

26 5.6.2.3 Aircraft Operations

27 The proposed BRSF aircraft operations detailed below include FWALS landings, HLZ/DZ
 28 landings, and FARP/HGO. FWALS landings and HLZ/DZ landings may occur within LU-1 and
 29 LU-2 areas, while FARP/HGO may only occur in LU-2 areas on asphalt or concrete. All activities
 30 must adhere to noted general and Proposed Resource-Specific Constraints and mitigations

**Figure 5-29. BRSF Bivouac Constraint Areas**

1 identified in Sections [3.6.4](#), respectively. FARP/HGO and other fueling activities were
 2 previously discussed in Section [3.6](#), and no adverse impacts were identified.

3 **FWALS Landings**

4 *TA-2 Munson Airfield Landings Determination:* Since the Munson Airfield is currently utilized for
 5 aircraft operations, it is anticipated that LAPT training conducted at this location would result
 6 in neutral, fully reversible impacts. No modifications to the existing airfield would likely be
 7 required to accommodate proposed aircraft mission activities. Impacts would likely be
 8 limited to minor disturbances of maintained areas that could be fully recovered during
 9 routine FWALS maintenance. The proposed use of light military aircraft is not anticipated to
 10 exceed the surface loading and pressures associated with other aircraft that use the airfield.
 11 Furthermore, no loss or degradation of prime farmland soils or geologic steephead or closed
 12 depression features is anticipated.

13 *TA-1 and TA-9 Unpaved Road FWALS Landings Determination:* As discussed in Section [3.6](#),
 14 potential earth resource impacts include soil compaction, rutting, and erosion. Areas prone
 15 to physical damage from compaction are the undisturbed ground adjacent to the existing
 16 roadway that could be incorporated into the landing zone. The effects of undisturbed
 17 ground compact would extend for the life of the FWALS landing zone. Soil rutting would
 18 most likely occur within the lateral clearance zones during maintenance activities under
 19 saturated soil conditions. Since area slopes are relatively minor and there are no road-stream
 20 crossing within the proposed footprint, construction-induced soil erosion would be limited to
 21 the immediate area and would not likely affect water resources.

22 **HLZ/DZ Landings**

23 Proposed HLZ/DZ-based aircraft landing activities include A/LVL and LLHI/E training at
 24 existing cleared areas, primarily clearcuts, in various locations at BRSF (see Section [2.3.2.1](#)). All
 25 forest tactical areas are candidate locations. No landing strips, helicopter pads, or other
 26 construction activities would be required to prepare selected sites. For safety and operational
 27 reasons, aircraft landings would take place on relatively level ground that is less prone to
 28 unstable soil conditions and soil erosion than steeper sites.

29 Based on analyses presented in Section [3.6](#), BRSF HLZ suitability and limitation constraint
 30 areas are summarized in [Table 5-29](#) and [Figure 5-30](#). Very limited areas fall under the LU-1
 31 category and would be limited in use for HLZs/DZs.

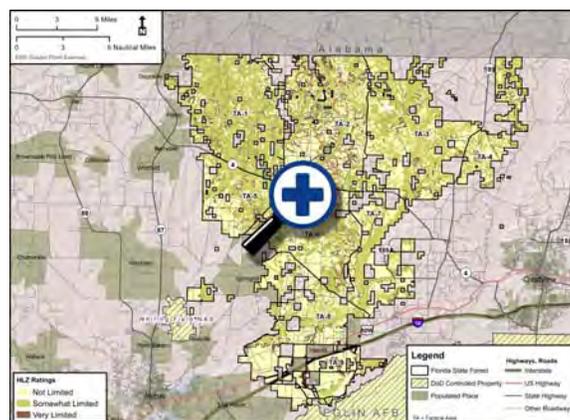


Figure 5-30. BRSF Helicopter Landing Zone Constraint Areas

1

Table 5-29. BRSF Helicopter Landing Zone Constraint Areas

Tactical Area (TA)	Constraint Area (acres)			Total Area ¹ (acres)
	Not Limited	Somewhat Limited	Very Limited	
Coldwater (TA-1)	8,251	24,526	1,662	34,439
Sweetwater (TA-2)	18,004	12,760	4,927	35,691
Rock Creek (TA-3)	11,875	19,462	1,402	32,739
Horse Creek (TA-4)	4,786	5,665	1,040	11,491
West Boundary (TA-5)	7,047	8,341	721	16,109
Floridale (TA-6)	11,452	10,947	1,866	24,265
Bone Creek (TA-7)	7,740	7,779	607	16,126
Juniper Creek (TA-8)	14,792	6,461	1,111	22,364
Yellow River (TA-9)	9,048	1,874	1,028	11,950
Total	92,995	97,815	14,364	205,174

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

2 Again, with the implementation of mitigations specific to earth resources (see Section [3.6.4](#)),
3 potential soil erosion, compaction, and rutting impacts from proposed FWALS landings and
4 HLZ/DZ use at BRSF are anticipated to be adverse but insignificant, site specific, low intensity,
5 and short term. No loss or degradation of prime farmland, karst soils, geologic steephead, or
6 closed depression features is anticipated. Since no hydric soils were identified within the
7 estimated footprint area, federal or state wetland permits are not likely required.

8 **5.6.2.4 Amphibious Operations**

9 Boat and troop egress and ingress activities would occur along the banks and shorelines of
10 available training areas within all use areas (except prohibited areas and RAs), with noted
11 General Operational Constraints and Proposed Resource-Specific Mitigations identified in
12 Sections [2.5](#) and [3.6.4](#), respectively. As discussed in Section [3.6](#), AO could disturb soils and
13 trample vegetation, resulting in conditions that may result in accelerated bank erosion.

14 As discussed in Section [5.6.1.2](#), some reaches of larger BRSF streams are experiencing
15 scouring and mass failures from overheightened and oversteepened bank conditions. These
16 features are most common along river bendways and are particularly sensitive to disturbance.
17 These conditions are likely most common water bodies such as the Blackwater River. AO
18 conducted in these sensitive locations or other water areas with similar conditions could
19 further destabilize streambanks and significantly increase soil loss and streambank retreat.

20 On streambanks and shorelines with established vegetation and stable grades (not
21 overheightened or oversteepened), impacts would consist of minor disturbances that, in
22 most cases, would naturally recover. Operations conducted at boat launches would not likely
23 increase streambank degradation or soil loss.

24 Implementation of General Operational Constraints and Proposed Resource-Specific
25 Mitigations, such as rotation of ingress/egress locations, would serve to minimize impacts to
26 earth.

5.6.3 Earth Resources Impact Summary

Table 3-27 describes the context, intensity, and duration factors utilized in analysis for impacts to earth resources; based on these factors the Air Force has identified some insignificant impacts to the natural environment. In summary, there are unavoidable adverse impacts associated with minor soil erosion impacts resulting from use of existing roadways for fixed-wing aircraft landing, HLZ/DZ use, ground movement, and AO. No NPDES permitting requirements have been identified. The intensity of these impacts is minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Section 2.5 and 3.6.4, respectively.

Table 5-30 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

Table 5-30. Earth Resource Impacts by TA – BRSF

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	Potential soil erosion impacts associated with roadside bushhogging and road grading for roadway improvement for FWALS. Use of standard erosion BMPs would minimize this impact.	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).							Potential soil erosion impacts associated with roadside bushhogging and road grading for roadway improvement for FWALS. Use of standard erosion BMPs would minimize this impact.
Point impact	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).								
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	Potential for soil compaction, rutting, and accelerated soil erosion associated with ISD on roadways. Vehicle use at water crossings could increase soil erosion and mobilization of streambed sediments. Additionally, soil/water contamination could result from fuels and other materials on roadways and in parking areas. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact.								
Dismounted movement	Negligible, short-term potential for soil compaction and accelerated soil erosion associated with trampling and incidental surface disturbance. Impacted areas would be expected to naturally recover.								
Use of Expendables									
Blanks/GBS	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).								
Smoke grenades									
Other/equipment									

Table 5-30. Earth Resource Impacts by TA – BRSF, Cont’d

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Aircraft Operations	Potential for soil compaction, rutting, accelerated soil erosion, and soil/water contamination from landing/takeoff activities and refueling activities. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact.								
Amphibious Operations	Operations could further destabilize streambanks in some reaches of larger BRSF streams (e.g., Blackwater River) with existing overheightened and oversteepened bank conditions, resulting in increased soil loss and streambank retreat. In streams with established vegetation and stable banks, minor disturbances would be expected to naturally recover. Operations at boat launches should not have any adverse effects. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact.								
Utilities	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).								

BMP = best management practice; FWALS = Fixed-Wing Aircraft Landing Sites; GBS = ground burst simulator; ISD = incidental surface disturbance; TA = tactical area

1 **5.6.4 Proposed Resource-Specific Mitigations**

2 No additional Resource-Specific Mitigations for earth resources have been identified as a
 3 result of analyses in this chapter. All General Operational Constraints (Section 2.5) and
 4 Proposed Resource-Specific Mitigations (Section 3.6.4) identified previously would sufficiently
 5 minimize any identified adverse impacts (yellow), mitigating them to beneficial or no impact
 6 (green).

7 **5.7 WATER RESOURCES**

8 **5.7.1 Affected Environment**

9 Water resources at BRSF include the watersheds of the Blackwater River and its tributaries, the
 10 sand and gravel and Floridan aquifers, and areas of wetlands and floodplains associated with
 11 the Blackwater River and its tributaries.

12 **5.7.1.1 Surface Waters**

13 The Blackwater River is the primary surface water feature in BRSF. The Blackwater River
 14 watershed is fed by three major tributaries: Juniper Creek, Coldwater Creek, and Sweetwater
 15 Creek (FDEP, 2004). The Blackwater River flows south into Blackwater Bay and the Gulf of
 16 Mexico. The Blackwater River watershed is one of the last natural shifting white-sand bottom
 17 river systems in the world. FDEP classifies the Blackwater River within BRSF as an OFW
 18 because of its high ecological integrity and recreation potential. Despite its OFW status,
 19 several streams within the Blackwater River watershed do not meet their designated use and
 20 are listed as impaired by FDEP. Table 5-31 lists impaired waters within the Blackwater River
 21 watershed and the impairment classification for each listed stream. Figure 5-31 provides an
 22 overview of surface water resources at BRSF. Figure 5-32 through Figure 5-40 provide more
 23 detailed views of surface water resources in each TA at BRSF.

1

Table 5-31. Impaired Waters in BRSF

Group Name	Receiving Body of Water	Impaired Classification
Pensacola ¹	Blackwater River	Verified impaired due to fish consumption advisory.
	Yellow River	Verified impaired due to mercury in fish and chloroform.
	Mare Creek	Potentially impaired due to low dissolved oxygen and increase turbidity.
	East Fork	Potentially impaired due to evidence of chloroforms and total suspended solids.
	Big Juniper Creek	Potentially impaired due to evidence of chloroforms and increases turbidity.
	Big Coldwater Creek	Potentially impaired due to evidence of chloroforms and total suspended solids.
	Little Withlocooche River	Potentially impaired due to evidence of dissolved oxygen and chloroforms.

1. Classified as 303d impaired waters.

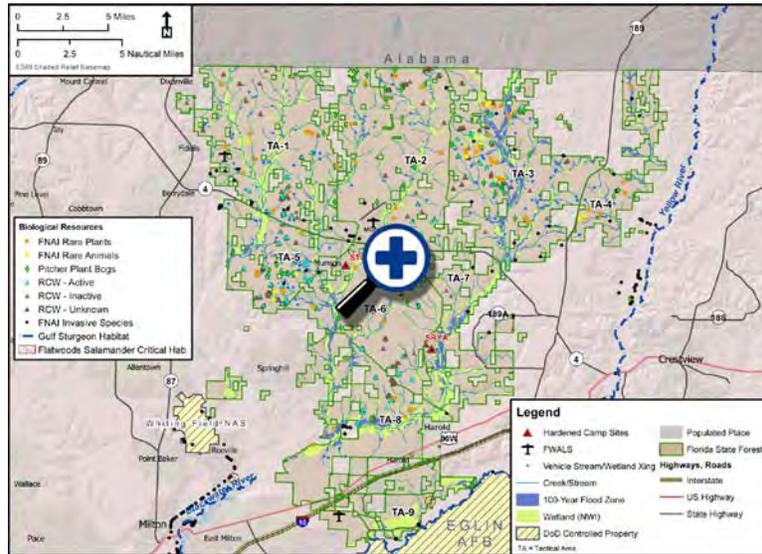


Figure 5-31. Water and Biological Resources at BRSF – Overview

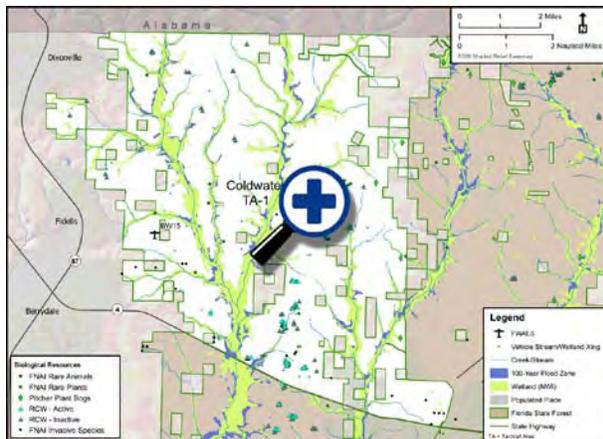


Figure 5-32. Water and Biological Resources – TA-1 at BRSF

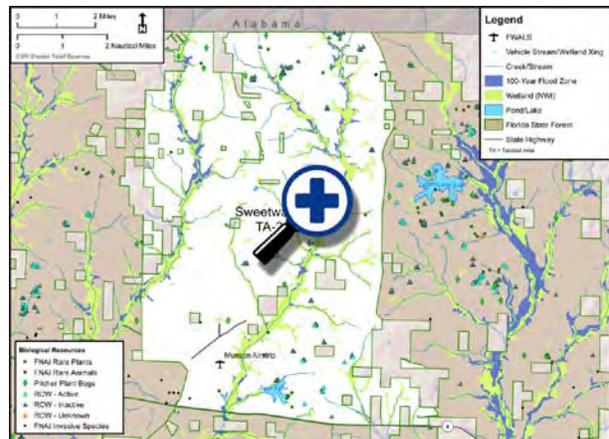


Figure 5-33. Water and Biological Resources – TA-2 at BRSF

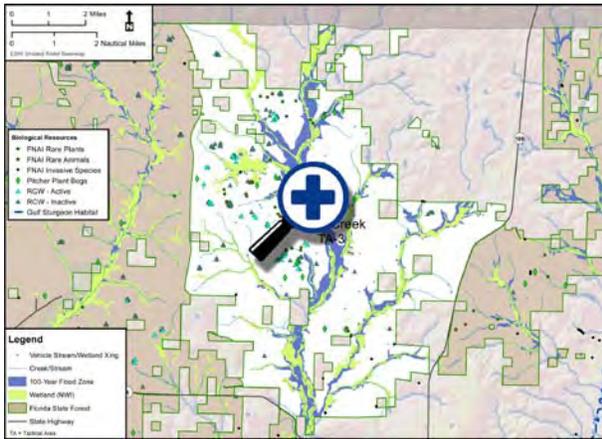


Figure 5-34. Water and Biological Resources – TA-3 at BRSF

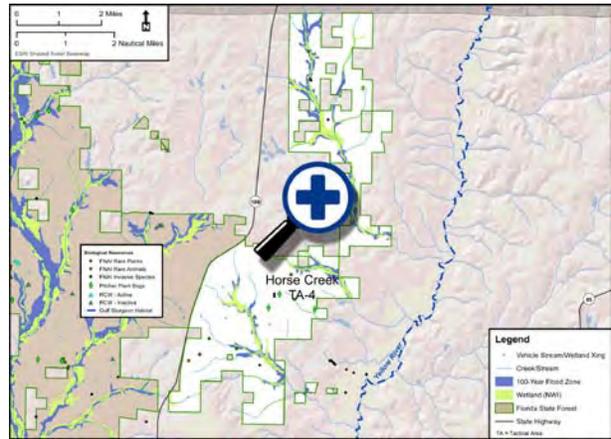


Figure 5-35. Water and Biological Resources – TA-4 at BRSF

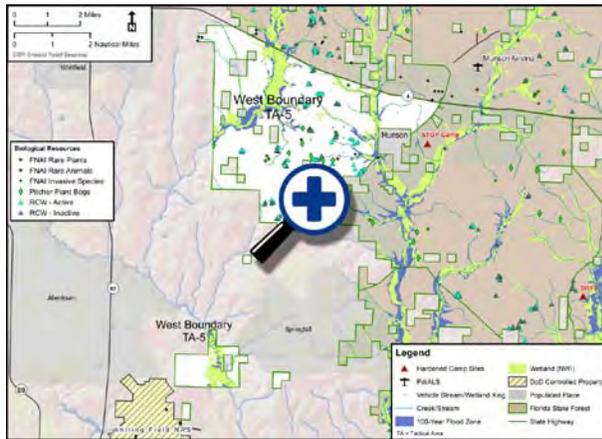


Figure 5-36. Water and Biological Resources – TA-5 at BRSF

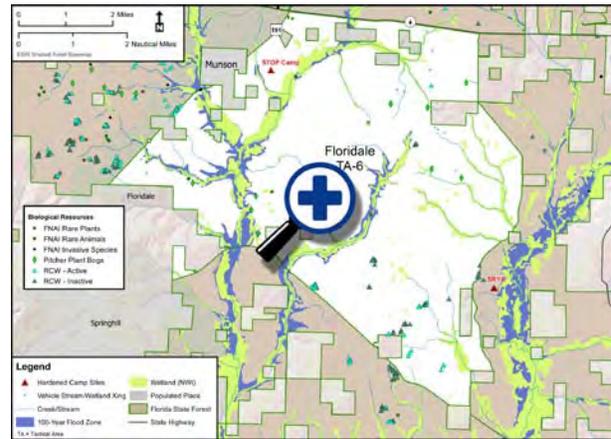


Figure 5-37. Water and Biological Resources – TA-6 at BRSF



Figure 5-38. Water and Biological Resources – TA-7 at BRSF

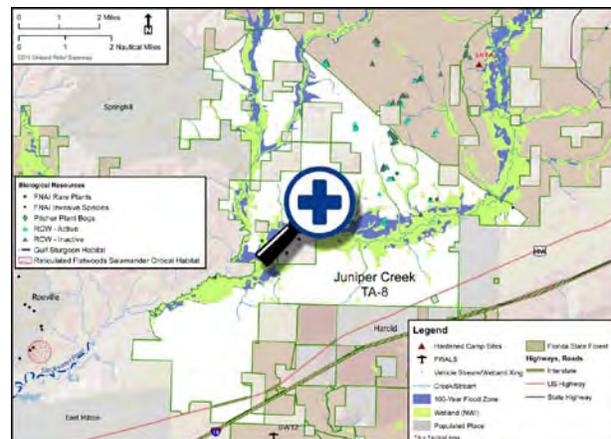


Figure 5-39. Water and Biological Resources – TA-8 at BRSF

1 **5.7.1.2 Wetlands**

2 Wetlands at BRSF are closely associated with
 3 stream channels in the area. There are
 4 27,222 acres of wetlands at BRSF, including
 5 nearly 26,414 acres of palustrine or
 6 freshwater wetlands, 495 acres of lacustrine
 7 wetlands, and 313 acres of riverine wetlands
 8 (Table 5-32). Palustrine or freshwater
 9 wetlands include forested wetlands, scrub-
 10 shrub wetlands, emergent wetlands, and
 11 ponds. Lacustrine wetlands include
 12 deepwater habitat (depths greater than
 13 6.6 feet) associated with lakes. Riverine
 14 wetlands occur entirely within stream
 15 channels of nontidal, low-gradient, perennial
 16 streams (Cowardin et al., 1979). Figure 5-31
 17 provides an overview of wetlands at BRSF. Figure
 18 5-32 through Figure 5-40 provide more detailed
 19 views of the distribution of wetlands in each
 20 TA at BRSF.

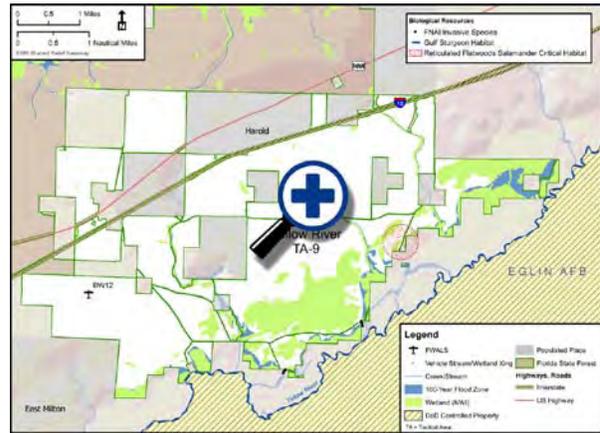


Figure 5-40. Water and Biological Resources – TA-9 at BRSF

Table 5-32. Wetlands Summary for BRSF (acres)

Wetland Type	Wetland Subtype	Tactical Area									Total
		1	2	3	4	5	6	7	8	9	
Palustrine	Forest	5,153	3,544	3,404	820	1,743	2,228	2,856	4,142	2,044	25,934
	Scrub-Shrub	71	7	43	7	21	5	24		97	275
	Emergent	5	16	7	8	27	16	35	13	16	143
	Ponds	10	13	2	2	1	2	24	5	3	62
Subtotal		5,239	3,580	3,456	837	1,792	2,251	2,939	4,161	2,160	26,414
Riverine	Instream	9		17		54	8	123	102		313
Lacustrine	Lakes		110	325	60						495
Grand total		5,249	3,690	3,798	897	1,846	2,259	3,062	4,262	2,160	27,222

20 **5.7.1.3 Floodplains**

21 Floodplains at BRSF are closely associated with stream channels and wetlands within the
 22 Blackwater River watershed, although floodplains are not as extensively distributed as
 23 wetlands. In all, 29,348 acres of floodplains have been mapped at BRSF (Table 5-33).
 24 Figure 5-31 provides an overview of floodplains at BRSF. Figure 5-32 through Figure 5-40
 25 provide more detailed views of floodplains in each TA at BRSF.

Table 5-33. Floodplain Summary for BRSF (acres)

Tactical Area										Total
1	2	3	4	5	6	7	8	9		
4,869	3,258	5,718	1,349	2,062	2,546	3,210	5,344	992	29,348	

5.7.2 Environmental Consequences

As discussed in Section 3.7, potential adverse impacts to water resources may occur from use of wheeled vehicles and dismounted maneuvers, and AO. Other Proposed Action effectors are not addressed in this subsection. Impacts to BRSF water resources identified in Section 5.7.1 would generally be the same as those described in Section 3.7.

Impact assessment considers implementation of the General Operational Constraints inherent to the Proposed Action as identified in Section 2.5. These constraints, such as establishment of buffers around sensitive water resource locations and habitats, would minimize potentially adverse impacts and, in some cases, preclude adverse impacts altogether. Avoidance areas for water resources are identified in Figure 5-1 through Figure 5-10.

5.7.2.1 Water Resource Protection Levels

Water resource protection levels were defined based on current environmental management requirements at Eglin AFB (EAFBI 13-212; U.S. Air Force, 2012). Water resources fall within the LU-1 protection level as described in Section 5.1, shown in Figure 5-1 through Figure 5-10 as yellow. The LU-1 protection level would affect all surface water bodies (streams, ponds, and lakes), wetlands, and floodplains and require a 100-foot buffer zone around these resources. No land disturbance would be permitted outside of previously disturbed roadbeds and road shoulders. Dismounted maneuvers and AO would be allowed, but concentrated troop movements would not be allowed on steep slopes, streambanks/shorelines, and wetlands. Pyrotechnic use outside of hardened campsites located at the SRYA and STOP would be limited only to smoke grenades.

Wheeled vehicle use would be restricted to existing, approved roads and trails in each tactical area. Table 5-34 summarizes the types and conditions of stream and wetland crossings at each TA at BRSF. Wheeled vehicle use of stream and wetland crossings would be restricted to crossings with a good or fair rating, and in coordination with the FFS. Vehicle access would be prohibited at stream and wetland crossings rated in poor condition. Currently at BRSF, 115 stream crossings and 41 wetland crossings are rated good or fair ratings, and 45 stream crossings and 35 wetland crossings are rated poor. Stream and wetland crossings at BRSF, and their relative conditions, are shown in Figure 5-1 through Figure 5-10. Good/fair crossings are shown in light blue, while poor condition crossings are identified by dark blue.

Table 5-34. Stream/Wetland Road Crossing Condition Summary, BRSF

Water Resource	Crossing Condition	Tactical Area									Total
		1	2	3	4	5	6	7	8	9	
Streams	Good	6	10	6	1	6	0	0	3	0	32
	Fair	16	11	20	4	12	4	5	11	0	83
	Poor	2	3	27	3	0	5	0	5	0	45
Streams Subtotal		24	24	53	8	18	9	5	19	0	160
Wetlands	Good	0	0	1	0	2	0	0	1	0	4
	Fair	9	1	3	0	13	5	0	6	0	37
	Poor	16	2	5	1	6	4	1	0	0	35
Wetlands Subtotal		25	3	9	1	21	9	1	7	0	76
Grand Total		49	27	62	9	39	18	6	26	0	236

1 Restrictions under the LU-1 protection level would prevent any surface disturbance on a total
 2 of 50,580 acres or 24.65 percent of BRSF (see [Table 5-35](#)). These restrictions in each TA range
 3 from 2,516 acres to 8,891 acres (19.19 percent to 32.60 percent of each TA). [Figure 5-1](#)
 4 through [Figure 5-10](#) provide more detailed views of water resource avoidance areas in each
 5 TA at BRSF. LU-1 areas are identified in each figure as solid yellow.

6 **Table 5-35. Water Resource Protection Level Summary, BRSF**

Protection Level	Tactical Area									Total
	1	2	3	4	5	6	7	8	9	
Limited Use-1 (LU-1) (acres)	8,891	6,850	8,743	2,516	3,457	4,532	5,258	7,273	3,060	50,580
% Area Affected	25.81	19.19	26.70	21.89	21.46	18.68	32.60	32.52	25.61	24.65

7 **5.7.2.2 Ground Movement**

8 Ground movement activities that could affect water resources at BRSF include wheeled
 9 vehicle use and CCDM.

10 ***Wheeled Vehicle Use***

11 Wheeled vehicle use would not directly affect surface water resources, since vehicles would
 12 not be allowed direct access to any surface waters or wetlands under the LU-1 protection
 13 level. Vehicle use would be restricted to existing roads and trails and approved, existing
 14 crossing locations in streams and wetlands.

15 Wheeled vehicle activities could indirectly affect water resources at BRSF. Routine use of the
 16 existing dirt road network at BRSF that extends throughout the TAs is a regular contributor to
 17 roadway erosion, and a recognized problem affecting some streams and wetlands (FDOF,
 18 2000). Leaks of fuel and other vehicle fluids would also be a potential indirect source of
 19 contamination to water resources as described under land improvement effects. Some
 20 indirect effects to water resources from roadway erosion are likely and assumed to occur.
 21 While the potential for these occurrences are inherent to vehicle use (whether for the military,
 22 the FFS, or civilians) and unavoidable, implementation of standard vehicle maintenance and
 23 spill prevention SOPs would minimize the potential to a negligible level.

24 ***Dismounted Movements***

25 Dismounted troop movement is a potential impact to surface water and wetland resources in
 26 all TAs at BRSF. Potential effects would be direct but on a minor scale. Rotation of any stream
 27 or water body ingress/egress areas would serve to minimize the potential for any medium- to
 28 long-term impacts associated with shoreline erosion, and units would be advised to avoid any
 29 noticeably eroded shorelines. Over the short term, sediments in the fast-flowing streams
 30 typical of those found at BRSF would settle rapidly and water clarity would return, causing the
 31 streams to return to their former state once units had moved on.

32 **5.7.2.3 Amphibious Operations**

33 As discussed in Section [3.7](#), AO may potentially result in disturbance of streambeds and
 34 shorelines from the loading and unloading of watercraft and movement of watercraft on the
 35 surface waters, as well as ingress/egress of troops over the land/water interface as detailed in

1 the *Riverine/Estuarine Programmatic Environmental Assessment* (U.S. Air Force, 2004). AO
 2 would adhere to the General Operational Constraints and mitigations identified in Section [2.5](#)
 3 associated with EAFBI 13-212, Section 7.2.9. Impacts to water resources would be minimized
 4 to levels less than significant by limiting activity to designated landing zones and by rotating
 5 landing zones when these areas show signs of erosion. There is potential for release of fuel
 6 from watercraft to surface waters, however, this potential is inherent to watercraft use
 7 (whether military or civilian). Such potential for adverse impacts would be minimized to a
 8 negligible level by implementation of SOPs for watercraft maintenance and spill prevention
 9 procedures as identified in Section [3.12](#). Motorized boats would be prohibited in Bear Lake.

10 **5.7.3 Water Resources Impact Summary**

11 [Table 3-31](#) describes the context, intensity, and duration factors utilized in analysis for
 12 impacts to water resources; based on these factors the Air Force has identified insignificant
 13 impacts to the natural environment. However, potential impacts to water quality would not
 14 adversely affect public health or safety. In summary, unavoidable, direct adverse impacts to
 15 wetlands from ISDs are associated with ground movement and AO. The intensity of any of
 16 the identified impacts would be minimized through General Operational Constraints and
 17 Proposed Resource-Specific Mitigations identified in Section [2.5](#) and [3.7.4](#), respectively. No
 18 USACE Section 404 permitting requirements have been identified.

19 [Table 5-36](#) summarizes the impacts identified. Impacts are categorized as follows:

- 20 • Adverse (yellow)
- 21 • Neutral/no effect (green)

22 **Table 5-36. Surface Water, Wetland, and Floodplain Impacts Summary – BRSF**

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	Floodplains would not be affected. However, while wheeled vehicles would be required to utilize existing and approved roadways and water and wetland crossings, unavoidable adverse but not significant impacts to surface waters and wetlands may occur from use of wheeled vehicles at water/wetland crossings. Minor impacts may be associated with indirect impacts from vehicles (oil drips, etc.). Mitigations to prevent environmental damage as described in Section 5.7.2.3 include use of only stream crossings rated "good" or "fair" for training exercises and avoiding use of crossings rated "poor." Leaks of vehicle fluids would be mitigated through proper vehicle maintenance and spill kits for field use. Implementation of these mitigations and constraints would reduce impact potentials from "yellow" to "green" by decreasing the potential for vehicle interaction with degraded resources and the potential for any spills to occur.								

Table 5-36. Surface Water, Wetland, and Floodplain Impacts Summary – BRSF, Cont'd

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Dismounted movement	Floodplains would not be affected. There is a potential for insignificant localized disturbance to shoreline and wetland vegetation (e.g., trampling) from personnel. This would be minor in nature and recoverable over the short term. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.5 (such as frequently rotating tactical area use and minimizing unit size) would reduce adverse impacts from "yellow" to "green" by minimizing the potential for excessive trampling and allowing natural recovery processes.								
Use of Expendables									
Blanks/GBS	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).								
Smoke grenades									
Other/equipment									
Aircraft Operations	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).								
Amphibious Operations	Floodplains would not be affected. Boat landings and nearshore activities would potentially result in shoreline erosion in streams and rivers. Activities in estuarine areas could affect wetlands, as could water-land transition actions. These impacts would be adverse but not significant, because they would be localized and recoverable over the short term via natural processes. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.5 (such as using only designated ingress/egress points and rotating water/land transition areas) would reduce adverse impacts from "yellow" to "green" by minimizing the potential for erosion to occur allowing natural recovery processes.								
Utilities	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).								

GBS = ground burst simulator

1 **5.7.4 Proposed Resource-Specific Mitigations**

2 The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has
3 recommended the following conservation measure: avoidance of "Good" and "Poor" rated
4 vehicle water crossings for training use in order to protect the better crossing sites and
5 minimize further degradation of the sites in poor condition.

6 No additional Resource-Specific Mitigations for water resources have been identified. All
7 General Operational Constraints (Section 2.5) and Proposed Resource-Specific Mitigations
8 (Section 3.7.4) identified previously would sufficiently minimize any identified adverse
9 impacts (yellow), mitigating them to beneficial or no effect (green).

10 **5.8 BIOLOGICAL RESOURCES**

11 **5.8.1 Affected Environment**

12 [Figure 5-31](#) provides an overview of biological resources at BRSF. [Figure 5-32](#) through
13 [Figure 5-40](#) provide more detailed views of biological resources in each TA at BRSF.

14 **5.8.1.1 Vegetation**

15 In combination with the Conecuh National Forest, BRSF is home of the largest contiguous
16 longleaf pine/wiregrass ecosystem in the world and contains some of the richest plant and

1 animal diversity. In 2006, FNAI completed an inventory and ecological community mapping
 2 project on 190,639 acres of BRSF. Types of vegetation found consist of mostly upland pine
 3 (approximately 70 percent of the land surveyed). The next largest ecological communities
 4 found are alluvial forest (approximately 14 percent) and sandhill (approximately 10 percent).
 5 Other types of vegetation include seepage slope, baygall, upland hardwood forest, mesic
 6 flatwoods, blackwater stream, floodplain swamp, dome swamp, depression marsh, and
 7 seepage slope (FDACS, 2013). [Table 5-37](#) lists representative vegetation species within each
 8 ecological community. More detailed descriptions of vegetation can be found in the *Guide to*
 9 *the Natural Communities of Florida* (FNAI, 2010).

10

Table 5-37. Ecological Communities Within BRSF

Vegetation Type	Description
Upland pine	Exists on high, rolling clay hills and consists of widely spaced trees with few shrubs and a dense cover of herbs often intergrading with sandhill. The dominant canopy tree is longleaf pine with scattered southern red oak and blackjack oak. Other species include shrubs such as dwarf huckleberry (<i>Gaylussacia dumosa</i>), gallberry, winged sumac, and Darrow's blueberry. Herbs are dense and dominated by wiregrass. Frequent low-intensity ground fires during the growing season reduce hardwood competition and facilitate pine and wiregrass reproduction.
Alluvial forest	Forms borders along the high sandy banks with a gradual transition to baygall as elevation increases. Alluvial forest mainly consists of Atlantic white cedar with slash pine and/or loblolly pine (<i>Pinus taeda</i>). Other plant species include red maple, sweetbay (<i>Magnolia virginiana</i>), tuliptree (<i>Liriodendron tulipifera</i>), black titi (<i>Cliftonia monophylla</i>), dahoon (<i>Ilex cassine</i>), American holly (<i>Ilex opaca</i>), swamp laurel oak (<i>Quercus laurifolia</i>), water oak (<i>Quercus nigra</i>), sourwood, and swamp bay. Short shrub species include coastal sweet pepperbush (<i>Clethra alnifolia</i>), blue huckleberry (<i>Gaylussacia frondosa</i> var. <i>tomentosa</i>), St. Andrew's cross (<i>Hypericum hypericoides</i>), mountain laurel (<i>Kalmia latifolia</i>), coastal doghobble (<i>Leucothoe axillaris</i>), and possumhaw. Hurricane Lake, Karick Lake, and Bear Lake are all converted seepage streams and alluvial forest.
Sandhill	Most abundant community in the southernmost region within TA-8 and TA-9. Dominated by widely spaced longleaf pine, turkey oak (<i>Quercus laevis</i>), and wiregrass. Other plant species include bluejack oak, sparkleberry (<i>Vaccinium arboreum</i>), common persimmon (<i>Diospyros virginiana</i>), and gopher apple (<i>Licania michauxii</i>). Sandhill requires growing season fires every 1 to 3 years to maintain open structure.
Seepage slope	Occurs adjacent to alluvial forest/baygall communities. Dominated by grass and sedge communities occurring on slopes with constant seepage from a perched water table where the ground is usually saturated but rarely inundated. These communities have very few trees and only occasional shrubs. Seepage slopes are historically open and dominated by a dense groundcover of wiregrass and toothache grass (<i>Ctenium aromaticum</i>). Community also supports pockets of carnivorous bog plants, especially pitcher plants (<i>Sarracenia</i> spp.) and sundews (<i>Drosera</i> spp.).
Baygall	Occurs at the edges of floodplains and along seepage streams and drainages from surrounding upland pine and sandhill communities. They are generally shrubby or forested seepage areas dominated by sweetbay (<i>Magnolia virginiana</i>), swamp bay (<i>Persea palustris</i>), black titi (<i>Cliftonia monophylla</i>), and titi (<i>Cyrilla racemiflora</i>). Seepage from surrounding uplands maintains a saturated substrate with peat moss (<i>Sphagnum</i> spp.), often forming mats. Baygalls are most commonly interlaced with alluvial forests and may also occur in broad grassy wet flatwoods communities at the bases of seepage slopes. Dominant baygall species are typically fire-intolerant.
Upland hardwood forest	Well-developed, closed-canopy forests of upland hardwoods on rolling hills occurring sporadically on rich hillsides. In the northeast corner of the forest, hardwood forests may have been more common prior to forest disturbance. The canopy is a mixture of deciduous species, mostly oaks (<i>Quercus</i> sp.) and occasionally American beech (<i>Fagus grandifolia</i>) and southern magnolia. Subcanopy and shrub layers are also well developed with a diversity of temperate species that grade gradually into upland pine on upper slopes and alluvial forest/baygalls on lower slopes. Mature hardwood forests create fire-resistant conditions through shading, reduction of herbaceous groundcover, and buildup of oak leaf litter, so fires from adjacent communities should be allowed to naturally extinguish at the edges of upland hardwood forest.

Table 5-37. Ecological Communities Within BRSF, Cont'd

Vegetation Type	Description
Mesic flatwoods	Open-canopied pine forests, predominately longleaf pine, with little to no mid-story and a fairly dense low shrub and herb layer. Occurs on relatively flat terrain with moderate to poor drainage, adjacent to alluvial forest with a very gradual transition to upland pine or sandhill and distinguished by an abundance of running oak (<i>Quercus elliotii</i>), dwarf live oak (<i>Quercus minima</i>), hairy laurel (<i>Kalmia hirsuta</i>), and false rosemary (<i>Conradina canescens</i>) in the short shrub and herb layers. Some mesic flatwoods sites in TA-9 have been converted to slash pine plantations.
Blackwater stream	Consists of Coldwater Creek, Blackwater River, Juniper Creek, Sweetwater Creek, Panther Creek, and Penny Creek. These are perennial or intermittent seasonal watercourses with sandy bottoms originating deep in sandy lowlands. Characteristic of tea-colored waters laden with tannins and are generally acidic. Emergent and floating aquatic vegetation growth is often reduced because of typically steep banks and considerable seasonal fluctuations in water level. Plant communities along these streams are usually either alluvial forest dominated by Atlantic white cedar or floodplain swamp dominated by pond cypress (<i>Taxodium ascendens</i>).
Floodplain swamp	Floodplain swamps are located along streams mostly in the southern portion of BRSF. They occur on the lowest parts of the floodplain and have a well-developed canopy of buttressed trees dominated by either pond cypress in the south or mostly swamp tupelo (<i>Nyssa sylvatica</i> var. <i>biflora</i>) in the north. Other canopy plant species include red maple, Atlantic white cedar, sweetbay, and slash pine. Some shrubs such as coastal sweet pepperbush (<i>Clethra alnifolia</i>), titi (<i>Cyrilla racemiflora</i>), wax myrtle, and fetterbush and hydrophytic herbs such as goldenclub (<i>Orontium aquaticum</i>) and common arrowhead (<i>Sagittaria latifolia</i>) may be sporadic.
Dome swamp	Occurs within upland pine and sandhills forming small, forested depressions consisting of a canopy of swamp tupelo and some pond cypress in the southern regions. Other tall shrubs and small trees include myrtle dahoon, swamp bay (<i>Persea palustris</i>), sweetbay (<i>Magnolia virginiana</i>), fetterbush, and large gallberry. Also may contain a clear herbaceous ring around these dome swamps forming an ecotone with the surrounding upland community. These ecotones are similar to wet prairies. Swamps that have been surrounded by development from agricultural and siccultural activities generally lack the wet prairie ecotone edge, potentially smothered by sediment from forest roads.
Depression marsh	Occurs in upland pine and sandhill communities creating a small, open circular basin dominated by herbaceous vegetation. An acidic peat layer of sphagnum moss (<i>Sphagnum</i> sp.) may also develop. Some marshes may have formed from seepage streams that have been dammed.
Seepage stream	Occurs in troughs of high rolling hills and bordered by closed canopy baygall/alluvial forests. These streams typically form the headwaters of many alluvial and blackwater streams and generally have sandy bottoms. Plants are not frequently found in these shallow ground waters that have percolated through deep, sandy, upland soils.

Sources: FDACS, 2013; FNAI, 2010

BRSF = Blackwater River State Forest; TA = tactical area

1 **5.8.1.2 Wildlife**

2 Florida's Wildlife Management Area (WMA) system is managed by the FWC to sustain the
3 widest possible range of native wildlife in their natural habitats. BRSF consists of four WMAs:
4 Blackwater WMA, the Yellow River WMA, the Blackwater Carr Unit, and the Blackwater Hutton
5 Unit (FFS, 2013b).

6 The FFS and FWC cooperatively maintain 60 acres of permanent wildlife openings and
7 214 acres of planted food plots on BRSF. These areas range from 0.1 to 15.4 acres and are
8 established and maintained in accordance with the FFS State Forest Handbook (FDACS, 2013).

9 The Great Florida Birding Trail passes through BRSF, and many birds can be found such as
10 mourning dove, myrtle warbler, red-tailed hawk, red-headed woodpecker (*Melanerpes*

1 *erythrocephalus*), and the Carolina wren (FWC, 2013a). Hunting is allowed in designated areas
2 throughout BRSF. Game animals include deer, wild hog, turkey, gray squirrel, quail, raccoon,
3 bobcat, waterfowl, crow, and dove, among others (FDACS, 2013).

4 **5.8.1.3 Protected Species**

5 Three federally listed endangered species are found within BRSF, the red-cockaded
6 woodpecker (*Picoides borealis*) (RCW), the reticulated flatwoods salamander (*Ambystoma*
7 *bishopi*) and the Choctaw bean mussel (*Villosa choctawensis*). The longleaf pine ecosystem of
8 BRSF provides the perfect habitat for the RCW. With the implementation of the *Recovery Plan*
9 *for the Red-cockaded Woodpecker* (*Picoides borealis*) (USFWS, 2003), the population of RCWs is
10 recovering, with over 90 active clusters which includes 89 potential breeding pairs
11 documented on BRSF (Gault, 2013). Nesting season occurs between April and July. One
12 population of reticulated flatwoods salamander has been previously documented breeding
13 on a single pond in the Yellow River Ravines TA (TA-9). However, this species has not been
14 recently found in BRSF (FDACS, 2013). The Choctaw bean and critical habitat for this species
15 are found in TA-9 within the Yellow River.

16 There are several federally listed threatened species. One federally listed threatened species
17 on BRSF is the eastern indigo snake (*Drymarchon couperi*). Habitat for this species seems to be
18 good within BRSF, however, the eastern indigo snake has not been found on BRSF for many
19 years (FDACS, 2013). Three mussels, the narrow pigtoe (*Fusconia escambia*), southern
20 sandshell (*Hamiota australis*) and fuzzy pigtoe (*Pleurobema strodeanum*), and their critical
21 habitat are found in TA-9 in the Yellow River.

22 One state-listed threatened species on BRSF is the gopher tortoise (*Gopherus polyphemus*).
23 The gopher tortoise is associated mainly with sandhill habitat. They dig deep burrows for
24 shelter and forage on low-growing plants. Nesting occurs during May and June, and hatching
25 occurs from August through September (FWC, 2001).

26 The Gulf sturgeon (*Acipenser oxyrinchus destoi*), another federally listed threatened species,
27 can be found in several rivers throughout Florida and spends the major part of the year in
28 freshwater, migrating to saltwater in the fall. Movement from the Gulf of Mexico and upriver
29 movement generally occur between February and April when spawning season occurs, while
30 downriver movement occurs between September and November.

31 The bald eagle has been federally delisted due to its recovery; however, it is afforded
32 protection under the BEPA. In August 2012, FWC removed the Florida black bear from the
33 state-threatened species list; however, the species is protected under the Florida Black Bear
34 Conservation Rule [Florida Administrative Code (FAC) 68A-4.009]. Potential impacts from the
35 Proposed Action to federally listed species require the Air Force to consult with the USFWS
36 regarding impacts to federally protected species. The Air Force has conducted Endangered
37 Species Act Section 7 consultation with the USFWS for this Proposed Action, and the USFWS
38 has concurred with the Air Force determination that it may affect but is not likely to adversely
39 affect endangered species (USFWS, 2014). [Table 5-38](#) includes all federally listed and state-
40 listed species known to occur or with the potential to occur within BRSF. Some bird and
41 wildlife species have the potential to occur throughout several TAs within BRSF, depending
42 on habitat associations and feeding habits. Plant species with a recorded occurrence within a
43 particular TA are noted as confirmed in [Table 5-38](#).

1

Table 5-38. Protected Species Known or Potentially Occurring in BRSF

Species ¹	Tactical Area								
	1	2	3	4	5	6	7	8	9
●=Confirmed present; ○=Not present; ◻=Potential to occur									
Amphibians									
Reticulated flatwoods salamander (<i>Ambystoma bishopi</i>) LE/FE	○	○	○	○	○	○	○	○ ²	●
Pine barrens treefrog (<i>Hyla andersonii</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Gopher frog (<i>Rana capito</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Florida bog frog (<i>Rana okaloosae</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Molluscs									
Choctaw bean (<i>Villosa choctawensis</i>) LE	○	○	○	○	○	○	○	○	● ⁴
Narrow pigtoe (<i>Fusconia escambia</i>) LT	○	○	○	○	○	○	○	○	● ⁴
Southern sandshell (<i>Hamiota australis</i>) LT	○	○	○	○	○	○	○	○	● ⁴
Fuzzy pigtoe (<i>Pleurobema strodeanum</i>) LT	○	○	○	○	○	○	○	○	● ⁴
Reptiles									
Eastern indigo snake (<i>Drymarchon couperi</i>) LT/FT	◻	◻	◻	◻	◻	◻	◻	◻	◻
Gopher tortoise (<i>Gopherus polyphemus</i>) C/ST	●	●	●	●	◻	◻	◻	●	◻
Alligator snapping turtle (<i>Macrochelys temminckii</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Florida pine snake (<i>Pituophis melanoleucus mugitus</i>) N/SSC	◻	◻	◻	◻	●	◻	◻	◻	◻
Birds									
Red-cockaded woodpecker (<i>Picoides borealis</i>) LE/FE	●	●	●	○	●	●	○	●	○
Bald eagle (<i>Haliaeetus leucocephalus</i>) BEPA	◻	◻	◻	◻	◻	◻	◻	◻	◻
Mammals									
Sherman's fox squirrel (<i>Sciurus niger shermani</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Eastern chipmunk (<i>Tamias striatus</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Fish									
Gulf sturgeon (<i>Acipenser oxyrinchus desotoi</i>) FT/ST	○	○	○	○	○	○	○	○ ³	○ ³
Plants									
Hairy wild indigo (<i>Baptisia calycosa</i> var. <i>villosa</i>) N/LT	◻	◻	◻	◻	◻	◻	◻	◻	◻
Sweet shrub (<i>Calycanthus floridus</i>) N/LE	◻	◻	●	◻	◻	◻	◻	◻	◻
Piedmont jointgrass (<i>Coelorachis tuberculosa</i>) N/LT	◻	◻	◻	◻	◻	◻	◻	◻	◻
Spoon-leaved sundew (<i>Drosera intermedia</i>) N/LT	●	●	●	◻	◻	◻	◻	●	◻

Table 5-38. Protected Species Known or Potentially Occurring in BRSF, Cont'd

Species ¹	Tactical Area								
	1	2	3	4	5	6	7	8	9
Trailing arbutus (<i>Epigaea repens</i>) N/LE	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dwarf witch alder (<i>Fothergilla gardenii</i>) N/LE	☐	●	☐	☐	●	☐	☐	☐	☐
Mountain laurel (<i>Kalmia latifolia</i>) N/LT	☐	●	●	●	☐	●	☐	☐	☐
Bog button (<i>Lachnocaulon digynum</i>) N/LT	☐	☐	☐	☐	☐	☐	☐	☐	☐
Panhandle lily (<i>Lilium iridollae</i>) N/LE	●	☐	☐	☐	☐	☐	☐	☐	☐
Hummingbird flower (<i>Macranthera flammea</i>) N/LE	☐	☐	☐	☐	●	☐	☐	☐	☐
Primrose-flowered butterwort (<i>Pinguicula primuliflora</i>) N/LE	●	☐	☐	☐	☐	●	☐	☐	☐
Little club-spur orchid (<i>Platanthera clavellata</i>) N/LE	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yellow fringeless orchid (<i>Platanthera integra</i>) N/LE	☐	☐	☐	☐	☐	☐	☐	☐	☐
Giant orchid (<i>Pteroglossaspis ecristata</i>) N/LT	☐	☐	☐	☐	☐	☐	☐	☐	☐
Arkansas oak (<i>Quercus arkansana</i>) N/LT	☐	●	☐	☐	☐	☐	☐	☐	☐
Small-flowered meadowbeauty (<i>Rhexia parviflora</i>) N/LE	☐	☐	☐	☐	☐	☐	☐	●	☐
Florida flame azalea (<i>Rhododendron austrinum</i>) N/LE	☐	☐	☐	☐	☐	●	☐	☐	☐
Hairy-peduncled beaksedge (<i>Rhynchospora crinipes</i>) N/LE	☐	☐	☐	☐	☐	☐	☐	☐	☐
White-top pitcherplant (<i>Sarracenia leucophylla</i>) N/LE	●	●	●	☐	●	●	☐	●	☐
Sweet pitcherplant (<i>Sarracenia rubra</i>) N/LT	●	☐	☐	●	☐	☐	☐	☐	☐
Harper's yellow-eyed grass (<i>Xyris scabrifolia</i>) N/LT	☐	☐	☐	☐	☐	☐	☐	☐	☐

Sources: FDACS, 2013; USFWS, 2013; FNAI, 2013a

BEPA = Bald Eagle Protection Act; FWC = Florida Fish and Wildlife Conservation Commission;

TA = tactical area; USFWS = United States Fish and Wildlife Service; Federal status (USFWS):

LE = listed endangered, LT = listed threatened, C = candidate, N = not currently listed

State status (FWC except where noted): LE = listed endangered, LT = listed threatened, FE = listed as

endangered species at the federal level by the USFWS, FT = listed as threatened species at the federal level

by the USFWS, SSC = species of special concern, ST = state population listed as threatened by the FWC

●=Confirmed present; ○=Not present; ☐=Potential to occur

1. Descriptions of most species can be found at <http://fnai.org/bioticssearch.cfm>.

2. Critical habitat occurs within and adjacent to TA-8.

3. Gulf Sturgeon habitat does not occur on BRSF, however, critical habitat for this species is located adjacent to TA-8 and TA-9.

4. Critical habitat occurs in the Yellow River adjacent to TA-9.

1 5.8.1.4 Sensitive Habitats

- 2 As stated previously, BRSF is home to the largest contiguous longleaf pine/wiregrass
 3 ecosystem in the world. Longleaf pine communities provide habitats for many plants and
 4 animals, including many classified as endangered, threatened, or species of special concern

(SSC). This ecosystem once covered over 90 million acres in the southeastern U.S., and now less than 3 million acres remain (FDACS, 2013). Longleaf pine–wiregrass flatwoods and slash pine flatwoods terrestrial habitat is crucial for the recovery of the RCW and the reticulated flatwoods salamander. Conservation of wetlands and ponds is also crucial for the reticulated flatwoods salamander to breed. See Section [5.7.1, Water Resources – Affected Environment](#), for information on wetlands, floodplains, and other bodies of water throughout BRSF that are important habitat areas for the conservation of protected species.

Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Red-cockaded woodpeckers excavate cavities in live pines; these cavities constitute a critical resource. Longleaf pine is a preferred tree species for cavity excavation, because it produces a long-lasting resin that creates an effective barrier against climbing snakes (USFWS, 2003). [Table 5-39](#) lists documented RCW tree cavities of an active, inactive, or unknown status and are differentiated in [Figure 5-31](#) through [Figure 5-40](#) (which depict water and biological resources at BRSF).

Other sensitive habitats include gopher tortoise burrows. Both the tortoise and its burrow are protected under state law. Gopher tortoises share these burrows with more than 360 other species, such as the federally threatened eastern indigo snake. The gopher tortoise is associated with sandhill habitat and well-drained uplands with associated wetlands (FWC, 2001). Gopher burrows on BRSF are mainly found in the northwestern area of BRSF, TA-1, and the southwestern region of TA-9.

Critical habitat for the Gulf sturgeon habitat is found outside the southern area of BRSF adjacent to TA-8 and TA-9 in the Blackwater River and the Yellow River, respectively. Additionally, critical habitat for the reticulated flatwoods salamander is found outside of BRSF, southwest and adjacent to TA-8 and within and adjacent to the southern region of TA-9. As stated previously, reticulated flatwoods salamander was previously documented on a single breeding pond in BRSF (TA-9), however, this species has not been recently found breeding in this area. Critical habitat for the four species of mussel listed in [Table 5-38](#) is found in the Yellow River along the boundary of TA-9.

Pitcher plant bogs, typically located within seepage slopes, are found scattered throughout BRSF. They occur in isolated depressions of somewhat poorly drained soils. Steps are taken to preserve and protect these areas because they contain a high diversity of rare plant species (FDACS, 2013).

[Table 5-39](#) lists documented sensitive habitats that occur within BRSF.

Table 5-39. Occurrence of Sensitive Habitats Within BRSF

Habitat Type	Tactical Area (Number Documented)								
	1	2	3	4	5	6	7	8	9
RCW tree cavities ¹	131	112	293	13	366	167	10	175	-
Gopher tortoise burrows ²	299	-	-	-	-	-	-	21	-
Pitcher plant bogs	4	10	13	3	7	9	-	1	-

Source: FFS, 2012a

BRSF = Blackwater River State Forest; RCW = red-cockaded woodpecker

1. Includes active, inactive, or unknown status of tree cavities. "Inactive" can include dead or abandoned.

2. Includes active, inactive, or possibly active status of burrows. "Inactive" can include abandoned.

5.8.1.5 Invasive Species

FFS continually monitors BRSF for nonnative invasive species. Invasive species have the potential to compete with and displace native species. FFS staff conducts surveys and record data into a GIS database, which is updated as new plants are discovered. Some invasive species identified within BRSF include cogon grass (*Imperata cylindrical*), Chinese tallow (*Sapium sebiferum*), Japanese climbing fern (*Lygodium japonicum*), Chinese privet (*Ligustrum sinense*), Chinese wisteria (*Wisteria sinensis*), mimosa (*Albizia julibrissin*), and Japanese honeysuckle (*Lonicera japonica*). The invasive species most found on BRSF are cogon grass and Japanese climbing fern, which have spread significantly since Hurricane Ivan (FDACS, 2013).

[Table 5-40](#) lists the number of documented invasive plant species surveyed. Each documented occurrence or location corresponds to an invasive species point shown on [Figure 5-31](#) through [Figure 5-40](#), which can represent an isolated occurrence or populations of multiple individuals. Invasive species can spread rapidly; however, the FFS continuously monitors and mitigates to control or eradicate invasive species throughout BRSF.

In addition to invasive plants, feral hogs (*Sus scrofa*) are present in some areas of BRSF. (FWC has issued a feral hog control trapping permit to FFS and encourages removal of this invasive species through trapping and hunting [FDACS, 2013]).

Table 5-40. BRSF TAs with Invasive Species

Invasive Species	Tactical Area								
	1	2	3	4	5	6	7	8	9
Documented occurrence (number of locations ¹)	23	7	13	14	7	1	12	1	1

Source: FNAI, 2011

1. One occurrence could refer to a single plant, a combination of scattered plants, or clumps surveyed.

5.8.2 Environmental Consequences

As discussed in Section [3.8](#), potential adverse impacts to biological resources may occur from dismantled maneuvers, UoEX, and aircraft and AO. Other proposed action effectors are not addressed in this section. The general analysis presented in Section [3.8](#) covers potential impacts to affected environment resources identified in Section [5.8.1](#).

Impact assessment considers implementation of the General Operational Constraints inherent to the Proposed Action as identified in Section [2.5](#). These constraints, such as establishment of buffers around sensitive species locations and habitat, serve to minimize potentially adverse impacts and, in some cases, avoid adverse impacts altogether. Avoidance areas for biological resources are identified in [Figure 5-1](#) through [Figure 5-10](#) and [Figure 5-11](#) through [Figure 5-20](#). General Operational Constraints identified in Section [2.5](#) require that all identified sensitive species locations and habitat would be protected, and aspects of EAFBI 13-212 and Eglin AFB sensitive species consultations would be implemented as part of the Proposed Action.

Additionally, impact analyses rely heavily on analysis and results as presented in the *Interstitial Area Range Final Environmental Assessment Revision 2*, *Eglin AFB Interstitial Area Biological Opinion*, *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion*, and the *Eglin*

1 *AFB Riverine/Estuarine Biological Assessment*. These documents analyze potential impacts to
 2 resources on the Eglin Range from activities associated with the Proposed Action. The
 3 resources addressed are similar to those that occur on BRSF (BRSF is adjacent to the Eglin
 4 Range). Impacts to BRSF biological resources identified in Section [5.8.1](#) would be the same as
 5 those described in Section [3.8](#).

6 **5.8.2.1 Vegetation**

7 The Proposed Action would cause adverse impacts to vegetation at BRSF. [Table 5-41](#) lists
 8 impacts to vegetation in each TA. Impacts are categorized as follows: adverse (yellow) and
 9 neutral/no effect (green). Most impacts to vegetation would result from temporary
 10 disturbances, such as trampling associated with ground movements, landing of aircraft, or
 11 minor ground disturbance, and would be recoverable through natural processes.

12 **Table 5-41. Vegetation Impacts by TA at BRSF**

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).								
Point impact									
Incidental surface Disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).								
Dismounted Movement	Adverse and unavoidable impacts would be from incidental direct physical impact (trampling). the intensity of the impacts would be minimized given implementation of General Operational Constraints and Proposed Resource-Specific Mitigations associated with regulating unit size and rotating use areas, thus allowing recovery of vegetation over the short term.								
Use of Expendables									
Blanks/GBS	Potential adverse impacts associated with increased wildfire potential from expendables and equipment usage. This increased potential would be unavoidable, and would persist over the long term. However, implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices would reduce the intensity of the impacts.								
Smoke grenades									
Other/equipment	The Air Force has not identified any adverse impacts vegetation associated with these activities (see Section 3.8).								
Aircraft Operations	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).								
Amphibious Operations	Potential adverse impacts to shoreline and aquatic vegetation due to trampling/rutting associated with landing of watercraft along shorelines. Impacts would be short term and recoverable through Proposed Resource-Specific Mitigations such as rotation of established landing sites.								

AFB = Air Force Base; BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

13 Potential wildfires resulting from expendables would impact BRSF ecological communities.
 14 As noted in Section [5.8.1.1](#), upland pine is the largest ecological community in BRSF and
 15 mainly consists of a longleaf pine/wiregrass ecosystem. Generally, controlled fire can be
 16 beneficial to ecological communities and species by maintaining the grassy understory and
 17 preventing mid-story encroachment. However, wildfires can damage the habitats of species
 18 that rely on these communities. According to the *Final Environmental Assessment for the Eglin*
 19 *AFB Integrated Natural Resource Management Plan Activities*, Eglin averages 110 wildfires

1 annually, with an average size of 60 acres. The majority of these wildfires are due to mission
 2 activities, primarily ordnance and pyrotechnics use (U.S. Air Force, 2013a). By comparison,
 3 BRSF averages 24 wildfires annually, with an average size of 30 acres (FDACS, 2013). Blanks
 4 and GBSs are noise-generating expendables that would only be used at two hardened camp
 5 sites at BRSF (SRYA Camp and STOP Camp). The potential for wildfires would mainly be due
 6 to the use of smoke grenades, which could be used throughout areas at BRSF within the LU-1
 7 protection level under fire restrictions identified in Section 2.5. These constraints would
 8 reduce the chance of wildfires caused by military activities at BRSF. Additionally, the FFS
 9 utilizes a fire management program that includes wildfire prevention, detection and
 10 suppression, and prescribed burning that would also help to minimize wildfire potential.

11 5.8.2.2 Wildlife

12 The Proposed Action would potentially cause adverse impacts to wildlife. [Table 5-42](#) lists
 13 impacts to wildlife in each TA. Impacts are categorized as follows: adverse (yellow) and
 14 neutral/no effect (green). Impacts would be related to temporary disturbances associated
 15 with harassment and/or displacement associated with general training activity, minor land
 16 disturbances, noise from expendable use, and wildfire potential. Permanent disturbances
 17 associated with consumption of wildlife would also adversely impact individual species.
 18 However, consumption would be intermittent and recoverable through natural processes
 19 and would result in a negligible long-term impact.

20

Table 5-42. Wildlife Impacts by TA at BRSF

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8).								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8).								
Dismounted movement	Potential for unavoidable incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). Probability for impact is low as a result of implementation of General Operational Constraints.								
Use of Expendables									
Blanks/GBS	There is a potential for adverse impact associated with increased wildfire potential from expendables usage. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices.								
Smoke grenades									
Other/equipment									
Aircraft Operations	Potential adverse impacts associated with disturbance from noise. However, aircraft noise would be temporary and intermittent in nature, allowing any dispersed wildlife to return to the area once aircraft have left the area.								
Amphibious Operations	Increased potential for direct physical impact by boat strike or indirect impact by disturbance or harassment. This increased potential would be unavoidable, and would persist over the long term. Boat landings and nearshore activities would potentially result in shoreline erosion, potentially impacting aquatic wildlife, as stated in Section 5.7.3. However, the potential would be minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations.								

AFB = Air Force Base; BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

5.8.2.3 Protected Species

As discussed in Section 3.8, protected species could be directly impacted by vehicle collisions, land disturbance, and expendables (from wildfire). Further, the effector mechanisms of noise and human activity related to military training are not unlike that of recreational hunting, logging, and other human activities that have been conducted at BRSF for many years. Thus, some species may have acclimated to noise and other disturbances. Vehicles would operate at or under 35 mph on BRSF dirt roads, which should reduce the chance for collision with bears, indigo snakes, or other animals that have been struck by vehicles in the past.

Noise-generating expendables (blanks/GBS) would only be used at the two hardened camp sites at BRSF, and these sites are not located near currently documented active RCW cavity trees and most other protected species. See Figure 5-37 and Figure 5-38.

Figure 5-1 through Figure 5-20 show buffer areas where sensitive species occur. In these buffer areas, training activities would either be restricted or limited at point locations. Sections 2.5 and 3.8.4 identify General Operational Constraints and Proposed Resource-Specific Mitigations associated with sensitive species.

Table 5-43 lists impacts to protected species in each TA. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green). Most impacts would be related to temporary disturbances, which would be minimized by avoidance measures.

Table 5-43. Protected Species Impacts by TA at BRSF

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	Known protected species locations would be protected (see Figure 5-1 through Figure 5-20). The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section 3.8).								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section 3.8).								
Dismounted movement	Known protected species locations would be protected (see Figure 5-1 through Figure 5-20). Potential direct physical impacts resulting in mortality, trampling, or disturbance of transient protected species. Short-term, localized impacts; while unavoidable, potential for occurrence can be mitigated by distributing educational materials to familiarize personnel with protected species so that troops can avoid transient species where possible. Additionally, established buffer areas around protected species habitats would be utilized.								
Use of Expendables									
Blanks/GBS	Use of Expendables would avoid known protected species locations (Figure 5-1 through Figure 5-20). Utilization of blanks and GBSs would be restricted to hardened camp sites, thus minimizing potential noise impacts. Potential adverse impacts associated with increased wildfire potential from utilization of expendables is unavoidable. These impacts are regional in context and long term in duration. Wildfire potential would be mitigated through implementation of safety requirements and adherence to BRSF and Eglin AFB wildfire management practices.								
Smoke grenades									
Other/equipment									
Aircraft Operations	Potential adverse impacts associated with noise disturbance. Impacts would be short term, localized, and mitigated through avoidance of known species locations and associated habitat (see Figure 5-1 through Figure 5-20), resulting in unavoidable, intermittent impacts to transient species. However, these impacts would not be considered significant given the context, intensity, and duration.								

Table 5-43. Protected Species Impacts by TA at BRSF, Cont'd

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Amphibious Operations	Known protected species locations would be protected (see Figure 5-1 through Figure 5-20). Potential for incidental direct physical impacts (boat strike) or incidental indirect impact of transient protected species could result; however, this potential is minimized given the proposed operational frequency and likelihood that any aquatic species would move from harm's way. As stated in Section 5.7.3 , boat landings and nearshore activities would potentially result in shoreline erosion potentially impacting protected aquatic species. However, the potential would be minimized by avoiding known locations of species and use of designated boat landings and crossings.								

AFB = Air Force Base; BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

1 **5.8.2.4 Sensitive Habitats**

2 Sensitive habitats with the potential to be impacted by the Proposed Action are shown in
 3 [Figure 5-31](#) and discussed in Section [3.8](#). Additionally, [Figure 5-1](#) through [Figure 5-20](#) show
 4 sensitive species constraint areas that include documented RCW cavity trees, pitcher plant
 5 bogs, and reticulated flatwoods salamander habitat. Training activities would either be
 6 restricted at point locations or limited in those designated buffer areas. Impacts to
 7 vegetation, discussed in Section [5.8.2.1](#), also apply to sensitive habitats at BRSF; however, all
 8 known sensitive habitats would be protected to the extent possible during training activities.
 9 Sections [2.5](#) and [3.8.4](#) identify General Operational Constraints and Resource-Specific
 10 Mitigations associated with sensitive habitats.

11 [Table 5-44](#) lists impacts to sensitive habitats in each TA. Impacts are categorized as follows:
 12 adverse (yellow) and neutral/no effect (green).

13 **Table 5-44. Sensitive Habitat Impacts by TA at BRSF**

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	
Land Disturbance	Known sensitive habitats would be protected (see Figure 5-1 through Figure 5-20). The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									Only reticulated flatwoods salamander habitat is documented in this TA, which would be avoided. As a result, the Air Force has not identified any adverse impacts to biological resources associated with these activities in this TA.
Land development										
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement	The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									
Wheeled vehicles	Known sensitive habitats would be protected (see Figure 5-1 through Figure 5-20). Potential adverse impacts could result from disturbance of sensitive habitats. These impacts are avoidable through established buffer areas around protected species habitats and other sensitive habitats.									
Dismounted movement	Figure 5-1 through Figure 5-20 show avoidance areas for sensitive habitats. Potential adverse impacts associated with increased wildfire potential from utilization of expendables would be unavoidable. These impacts would be regional in context and long term in duration. Wildfire potential would be mitigated through implementation of safety requirements and adherence to BRSF and Eglin AFB wildfire management practices.									
Use of Expendables										
Blanks/GBS										
Smoke grenades	The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									
Other/equipment										
Aircraft Operations	Figure 5-1 through Figure 5-10 show avoidance areas for sensitive habitats. Potential adverse impacts associated with activities in estuarine areas could result in direct physical									
Amphibious Operations										

Table 5-44. Sensitive Habitat Impacts by TA at BRSF, Cont'd

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
	impacts to aquatic vegetation along shorelines at ingress/egress points. However, impacts would be minimized to a negligible level through rotation of ingress/egress points and avoidance of areas exhibiting shoreline erosion as identified in Section 3.7.4. Additionally, as stated in Section 5.7.3, boat landings and nearshore activities would potentially result in shoreline erosion impacting protected aquatic vegetation. Any impacts would be recoverable over the short term with implementation of General Operational Constraints and Resource-Specific Mitigations.								

AFB = Air Force Base; BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

1 Areas potentially slated for ground-disturbing activities would be surveyed for gopher
 2 tortoises, and burrows would be avoided where possible. Burrows that cannot be avoided
 3 would be relocated in accordance with FWC guidelines. Additionally, there is a potential for
 4 wildfire from expended items to spread into other areas including those with sensitive
 5 habitats. Potential for wildfires to impact active RCW cavity trees would be lower in TA-4,
 6 TA-7, and TA-9, as no active RCW cavity trees have been documented in these TAs. The FFS
 7 works to prevent impacts to and manage fire-dependent habitats that support protected
 8 species through prescribed burning. Impacts from wildfires would be minimized to the extent
 9 possible through a program of prevention, response, and coordination with the FFS. Fire
 10 suppression activities, such as the use of heavy machinery for fire response, could result in
 11 changes to the landscape, localized alterations to hydrology, sedimentation, and direct
 12 damage to vegetation.

13 **5.8.2.5 Invasive Species**

14 As discussed in Section 3.8, the Proposed Action would potentially cause adverse impacts
 15 associated with the spread of invasive species resulting from use of expendables and the
 16 associated potential for wildfire. Implementation of General Operational Constraints and
 17 Proposed Resource-Specific Mitigations identified in Section 2.5 and 3.8.4, respectively, would
 18 reduce the potential for spreading invasive species.

19 [Table 5-45](#) lists invasive species impacts in each TA. Impacts are categorized as follows:
 20 adverse (yellow) and neutral/no effect (green).

Table 5-45. Invasive Species Impacts by TA at BRSF

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).								
Incidental surface disturbance									
Point impact									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).								
Dismounted movement									
Use of Expendables									

Table 5-45. Invasive Species Impacts by TA at BRSF, Cont'd

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Blanks/GBS	Indirectly, burned areas from wildfires started by expendables use could allow establishment and spread of invasives. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices.								
Smoke grenades									
Other/equipment	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).								
Aircraft Operations	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).								
Amphibious Operations	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).								

1 5.8.3 Biological Resources Impact Summary

2 [Table 3-34](#) describes the context, intensity, and duration factors utilized in analysis for
3 impacts to biological resources; based on these factors the Air Force has identified
4 insignificant adverse impacts to the natural environment. In summary, there are unavoidable
5 adverse impacts to biological resources from incidental disturbances associated with
6 dismounted maneuvers and aircraft and AO. Direct unavoidable impacts have also been
7 identified associated with increased wildfire potential resulting from training activities. The
8 intensity of any of the identified impacts is minimized through implementation of General
9 Operational Constraints and Proposed Resource-Specific Mitigations identified in Section 2.5
10 and 3.7.4, respectively. The Air Force completed consultation with USFWS in accordance with
11 Section 7 of the ESA on April 8, 2014, and has received concurrence on a finding of "Not Likely
12 to Adversely Affect" sensitive species or habitat (USFWS, 2014). A copy of the Biological
13 Assessment and all associated correspondence is included in Appendix C, *Consultation*
14 *Documentation*.

15 [Table 5-46](#) summarizes the impacts identified. Impacts are categorized as follows:

- 16 • Adverse (yellow)
- 17 • Neutral/no effect (green)

18 **Table 5-46. Biological Resource Impacts Summary – BRSF**

Proposed Action Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Land Disturbance	Protected species would be protected.		Known sensitive habitats would be protected.		The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).
Land development	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				
Point impact					
Incidental surface disturbance					
Consumption					
Ground Movement	Known locations of protected species would be protected.		Known sensitive habitats would be protected.		
Wheeled vehicles	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				

Table 5-46. Biological Resource Impacts Summary – BRSF, Cont’d

Proposed Action Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Dismounted maneuver	Potential for incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). However, occurrences are expected to be infrequent, and implementation of required General Operational Constraints would minimize the extent of any adverse impacts.				
Use of Expendables	At BRSF, noise-generating expendables would only be used at hardened camp sites.				Indirectly, burned areas from wildfires started by expendables could allow establishment and spread of invasives. This increased potential would be unavoidable and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices.
Blanks/GBS	Potential disturbance from noise would be minimal, since noise-generating expendables would only be used at hardened camp sites. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term, allowing species to resume normal activities. Increased potential for wildfire is considered an unavoidable, potentially adverse impact that would persist over the long term. However, given the potential frequency of occurrence based on mission frequency and implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices, impacts would be minimized.				
Smoke grenades					
Other/equipment	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				
Aircraft Operations	Potential short-term and intermittent noise disturbance to general wildlife species. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term allowing species to resume normal activities. Known protected species locations would be protected and not used as HLZs/DZs or FWALS.	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).			The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).
Amphibious Operations	Potential for incidental direct physical impact (boat strike) or incidental indirect impact (disturbance or harassment). However, while unavoidable, this potential is expected to be negligible given the proposed operational frequency and likelihood that any aquatic species would move from harm's way and/or return to the area once operations have ceased.	Activities in estuarine areas could affect marsh vegetation, oyster reefs, or seagrass, as could water-land transition actions. Boat landings and nearshore activities would potentially affect shoreline vegetation in streams and rivers. Given proposed frequency of operation and the implementation of General Operational Constraints and Proposed Resource-Specific Mitigations(e.g., rotation of landing sites), the potential for this occurrence is expected to be minimal.			
Utilities	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				

AFB = Air Force Base; BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground burst simulator; HLZ = helicopter landing zone; TA = tactical area

5.8.4 Proposed Resource-Specific Mitigations

In addition to the general operation constraints identified in Section 2.5, Proposed Resource-Specific Mitigations identified previously in Section 3.8.4, and those Resource-Specific Mitigations associated with earth resources (Section 3.6) and water quality (Section 3.7), the following additional Resource-Specific Mitigations have been identified that would further minimize impact potential or the severity of identified impacts; these are also included in the ESA Section 7 Consultation located in Appendix C:

- Identify designated boat landing areas for amphibious operations that occur in Gulf sturgeon and freshwater mussel critical habitat on the Yellow River, and in East Bay, preferably with improved surfaces.
- The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has recommended the following conservation measures: no low-water crossings or water-related training within 2 miles of the Blackwater River fish hatchery and avoidance of “Good” and “Poor” rated vehicle water crossings for training use in order to protect the better crossing sites and minimize further degradation of the sites in poor condition.

5.9 CULTURAL RESOURCES

5.9.1 Affected Environment

Forty-four cultural resource studies were conducted between 1977 and 2012 in the nine BRSF training areas. According to records of the Florida Division of Historical Resources (DHR), many of the training areas have been surveyed to some extent for cultural resources (Figure 5-41). Many of these surveys are either not up to current standards or were focused academic studies and are not comprehensive in nature (DHR, 2013). Appendix F, *Cultural Resources*, lists surveys conducted on BRSF.

Within BRSF, there are 196 archaeological sites ranging in age from twentieth century historic contexts to the Paleo-Indian period (10,000 years before Christ [B.C.]). Of these 196 sites, 111 (56.63 percent) are prehistoric, 29 (14.80 percent) are historic, and 2 (1.02 percent) are multicomponent historic and prehistoric. Due to insufficient information, the cultural or temporal affiliation of 54 sites (27.55 percent) cannot be determined. Most of the 196 sites have not been evaluated by either the principal investigator or the SHPO as to NRHP eligibility (DHR, 2013). Appendix F, *Cultural Resources*, lists sites considered potentially eligible along with those that remain unevaluated.

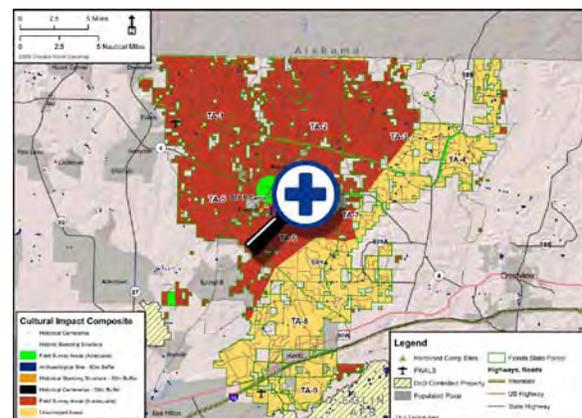


Figure 5-41. Cultural Resource Survey in BRSF

1 To date, two historic cemeteries have been identified on BRSF; both are located in Training
2 Area 1. The Concord/Simmons Cemetery (8SR00891) was first established in 1888; it is no
3 longer in use but is maintained by the state of Florida. This cemetery has not been evaluated
4 for NRHP eligibility. The Sellersville Cemetery (8SR01216) is privately maintained and it is not
5 known whether it currently is in use. This cemetery has not been evaluated for NRHP
6 eligibility (DHR, 2013). Additional information on these cemeteries can be found in
7 Appendix F, *Cultural Resources*.

8 One NRHP-eligible historic structure is located within the boundaries of BRSF. The Munson
9 Lodge (8SR01029), a vernacular-style structure constructed in 1927, is located within TA-6
10 (DHR, 2013).

11 To date, no historic districts, TCPs, or SSSs have been identified on BRSF (DHR, 2013).

12 **5.9.2 Environmental Consequences**

13 As discussed in Section [3.9](#), potential adverse impacts to cultural resources may occur from
14 land disturbance activities, dismantled movements, and AO due to ground disturbance.
15 Other Proposed Action effectors are not addressed in this section. Impacts to BRSF cultural
16 resources identified in Section [5.9.1](#) would be the same as those described in Section [3.9](#), that
17 is, potential disturbance or inadvertent discovery of previously unidentified cultural resources
18 in both surveyed and unsurveyed areas. Ground-disturbing activities would be limited in
19 unsurveyed areas, and known cultural resource locations would be avoided as part of general
20 operations constraints (see Section [2.5](#)). The Air Force has notified the ACHP, SHPO, and
21 applicable Native American tribes about this Proposed Action. The Air Force is completing a
22 Programmatic Agreement to meet its requirements under Section 106 of the NHPA. The final
23 Programmatic Agreement and results of the consultation process will be included in
24 Appendix C of the Final EIS.

25 **5.9.3 Cultural Resources Impact Summary**

26 [Table 3-37](#) describes the context, intensity, and duration factors utilized in analysis for
27 impacts to cultural resources. Based on the 36 CFR Section 800.5 definitions of “adverse
28 effect” and “no effect,” the Air Force has determined there is the potential for adverse effects
29 to cultural resources. Implementation of the General Operational Constraints identified in
30 Section [2.5](#) would minimize the potential for negative effects. In addition, units would have
31 access to a database and maps that would provide spatial and textual information on
32 restrictions associated with specific training areas. These tools would allow units quick access
33 to information on avoidance areas, thus minimizing the potential for impacts to cultural
34 resources.

35 [Table 5-47](#) summarizes the impacts. Impacts are categorized as follows:

- 36 • Adverse (yellow)
- 37 • No effect (green)

1

Table 5-47. Cultural Resource Impacts Summary by TA – BRSF

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	Known resource areas would be avoided. However, the potential exists to displace or destroy cultural resources in areas not previously surveyed or partially surveyed. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).								
Dismounted movement	Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5.								
Use of Expendables	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).								
Aircraft Operations	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).								
Amphibious Operations	Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5.								
Utilities	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).								

BRSF = Blackwater River State Forest; TA = tactical area

2 **5.9.4 Proposed Resource-Specific Mitigations**

3 No additional Resource-Specific Mitigations for cultural resources have been identified. All
 4 General Operational Constraints (Section 2.5) identified previously would sufficiently
 5 minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect
 6 (green).

7 **5.10 LAND USE**

8 **5.10.1 Affected Environment**

9 Existing and planned land uses at BRSF
 10 include agriculture, range land, transportation,
 11 communications, utilities, forested, urban/built
 12 up, water, and wetlands (FDEP, 2007b).
 13 [Figure 5-42](#) shows the land use types,
 14 recreational areas, private lands, and special
 15 use areas present at BRSF. [Table 5-48](#) lists the
 16 number, acreage, and percentage of the major

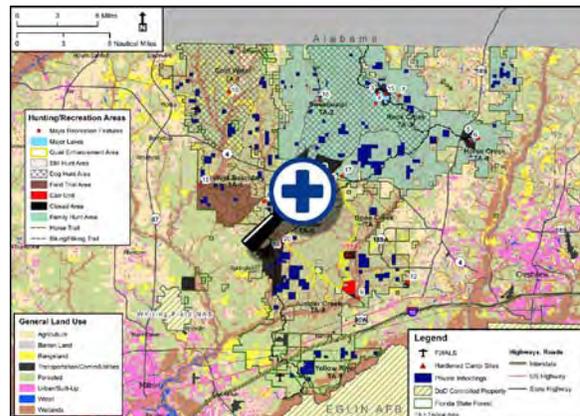


Figure 5-42. Land Use Types at BRSF

1 land use types, recreation areas, and privately owned parcels present in each TA at BRSF (TA-1
2 through TA-9). More detail regarding land use types and management practices at BRSF can
3 be found in the *Five Year Management Plan for Blackwater River State Forest*.

4 **Recreational Opportunities**

5 Several recreational areas are present at BRSF (Table 5-49). The major recreation areas include
6 Bear Lake Recreation Area, Bone Creek Recreational Area, Camp Paquette, Coldwater
7 Recreation Area, Hurricane Lake Recreation Area, Karick Lake Recreation Area, and the Krul
8 Recreation Area. These recreation areas provide opportunities for camping swimming,
9 picnicking, hiking, canoeing, fishing, horseback riding, and mountain biking as well as other
10 activities permitted in Florida state forests. BRSF also contains three separate WMAs including
11 the Blackwater WMA, the Blackwater Carr Unit, and the Blackwater Hutton Unit. These WMAs
12 provide opportunities for hunting, horseback riding, wildlife viewing, cycling, canoeing,
13 and fishing. Figure 5-42 shows the specific location of each recreational area at BRSF
14 (FDACS, 2004).

15

Table 5-48. General Land Use Types Present in TAs at BRSF

Tactical Area ¹	Land Use Type							
	Agriculture	Barren Land	Rangeland	Transportation/ Communications/ Utilities	Upland Forest	Urban/Built Up	Water	Wetlands
TA-1 (contains proposed FWALS)								
# Parcels	30	10	59	16	281	32	10	172
Acreage	98	16	2,108	203	22,980	44	75	7,772
% of TA	3	<1	6	<1	67	<1	<1	23
TA-2 (contains proposed FWALS)								
# Parcels	49	0	39	10	281	44	7	132
Acreage	498		1,154	88	27,195	141	139	6,463
% of TA	1		3	<1	77	<1	<1	18
TA-3								
# Parcels	78	3	25	7	243	43	11	155
Acreage	3,210	28	590	82	21,540	61	475	6,751
% of TA	10	<1	2	<1	66	<1	1	21
TA-4								
# Parcels	21	2	19	23	235	34	7	122
Acreage	42	2	97	82	8,727	49	69	2,417
% of TA	<1	<1	1	1	76	<1	1	21
TA-5								
# Parcels	55	21	41	6	125	22	2	189
Acreage	160	34	742	34	12,174	74	100	2,792
% of TA	1	<1	5	<1	76	<1	<1	17
TA-6 (contains hardened camp site)								
# Parcels	24	6	43	8	216	29	3	160
Acreage	25	3	782	51	19,829	39	43	3,494
% of TA	<1	<1	3	<1	82	<1	<1	14
TA-7 (contains hardened camp site)								
# Parcels	19	3	62	6	248	37	8	183
Acreage	105	9	885	42	10,873	34	156	4,024
% of TA	1	<1	5	<1	67	<1	<1	25

Table 5-48. General Land Use Types Present in TAs at BRSF, Cont'd

Tactical Area ¹	Land Use Type							
	Agriculture	Barren Land	Rangeland	Transportation/ Communications/ Utilities	Upland Forest	Urban/Built Up	Water	Wetlands
TA-8								
# Parcels	24	20	54	9	204	21	6	297
Acreage	9	25	2,058	151	15,492	33	180	4,417
% of TA	<1	<1	9	11	69	<1	1	20
TA-9 (Contains Proposed FWALS)								
# Parcels	14	2	16	8	153	25	3	143
Acreage	6	5	90	115	9,869	5	1	1,859
% of TA	<1	<1	1	1	83	<1	<1	16

TA = tactical area

Source: FDEP, 2007b

1. Percentages are approximate and rounded

1

Table 5-49. Recreational Areas at BRSF

Tactical Area (TA)	Major Recreational Areas and Features (Associated Uses)
TA-1	Callaway Swamp (canoeing) Camp Dowery Bridge (fishing/swimming/hiking)
TA-2	Camp Paquette (camping/picnicking/swimming/fishing/canoeing/hiking) Krul Recreation Area (swimming/hiking/camping/picnicking/) Bear Lake Recreation Area (fishing/hiking/mountain biking/canoeing/picnicking/camping) Sweetwater Hiking Trail Bear Lake Loop Hiking Trail Bear Lake Jackson Connector Hiking Trail
TA-3	North and South Hurricane Lake Recreation Areas (fishing/hiking/camping/picnicking/canoeing) Kennedy Bridge (swimming/fishing/canoeing) Wiregrass Hiking Trail
TA-4	North and South Karick Lake Recreation Areas (hiking/canoeing/fishing/picnicking/camping) Jackson Hiking Trail
TA-5	Coldwater Recreation Area (horseback riding/canoeing/swimming/picnicking/camping)
TA-6	Juniper Bridge (swimming/fishing/canoeing) Red Rock Bridge (swimming/fishing/canoeing) Jackson Hiking Trail
TA-7	Bone Creek Recreation Area (picnicking/swimming/fishing/canoeing) Bryant Bridge (swimming/fishing/canoeing)
TA-8	Juniper Creek Hiking Trail
TA-9	None

Source: FDEP, 2007b

2 Private and Adjacent Landowners

3 Several private inholdings are surrounded by, or adjacent to, the TAs at BRSF. Private parcels
4 include private land owners, commercial businesses, and housing for on-site staff.
5 [Figure 5-42](#) shows the locations of private parcels at BRSF. [Table 5-50](#) lists the number and
6 acreage of private parcels associated with each TA (FDEP, 2007b).

Table 5-50. Private Parcels Present at BRSF

Tactical Area (TA)	Name	Private Inholdings (Within Overall BRSF Perimeter)		# Private Holdings Adjacent to BRSF/TA Perimeter
		Quantity	Acreage	
1	Coldwater	138	2,298	138
2	Sweetwater	94	1,624	75
3	Rock Creek	106	2,087	174
4	Horse Creek	44	578	175
5	West Boundary	157	1,231	82
6	Floridale	112	1,574	86
7	Bone Creek	120	2,569	196
8	Juniper Creek	138	2,036	174
9	Yellow River	390	1,974	141

BRSF = Blackwater River State Forest; TA = tactical area

Source: FDEP, 2007b

5.10.2 Environmental Consequences

As discussed in Section 3.10, potential adverse impacts to land use may occur from noise resulting from UoEX and from aircraft operations. Other proposed action effectors are not addressed in this section. Impacts to BRSF land uses identified in Section 5.10.1 would be the same as those described in Section 3.10.

5.10.3 Land Use Impact Summary

Table 3-41 describes the context, intensity, and duration factors utilized in analysis for impacts to land use; based on these factors the Air Force has identified insignificant land use impacts to public health and safety and the human environment. Temporary annoyance to transient recreational users from noise during training activities (see Noise Sections 3.3 and 5.3) is unavoidable. Impacts to other recreational users and adjacent landowners would be minimized through implementation of operational constraints identified in Section 2.5, and avoidance of noise-sensitive areas (see Figure 5-11 through Figure 5-20).

Minor, short-term small-scale closures of areas (HLZs/DZs, road segments) during training activities would not preclude use of the forest and access would be allowed once training activities have ceased. The STOP Camp and SRYA site are currently not open to the public, and this would not change if the Air Force utilizes these locations. No conflicts with hunters have been identified since day-time training activities would be restricted during hunting season. While the impacts are adverse, the quality of the recreational experience may be somewhat diminished by these impacts, this would not preclude recreational use or cause general incompatibility, and impacts would be short term.

Table 5-51 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

1

Table 5-51. Land Use Impacts Summary by TA – BRSF

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	The Air Force has not identified any adverse impacts to land use associated with these activities (see Section 3.10).								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts to land use associated with these activities (see Section 3.10).								
Dismounted movement									
Use of Expendables									
Blanks/GBS	Noise-generating expendables would only be used in the vicinity of hardened camp sites. Measures would be taken to minimize noise impacts (see Figure 5-11 through Figure 5-20), but occasional low-level temporary noise impacts to recreational users and adjacent landowners could occur.								
Smoke grenades									
Other/equipment									
Aircraft Operations	Although measures such as restrictions regarding the timing and location of aircraft operations (see Figure 5-11 through Figure 5-20) would minimize noise impacts to recreational users and adjacent landowners, occasional low-level temporary noise impacts could occur.								
Amphibious Operations	The Air Force has not identified any adverse impacts to land use associated with these activities (see Section 3.10).								

BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

2 **5.10.4 Proposed Resource-Specific Mitigations**

3 No additional Resource-Specific Mitigations for land use have been identified as a result of
4 analyses in this chapter.

5 **5.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE**

6 **5.11.1 Affected Environment**

7 The main concerns regarding socioeconomics and environmental justice include noise,
8 safety, and disturbance associated with the military land and air training that could
9 potentially impact recreation and tourism and environmental justice-related populations.
10 Socioeconomic resources associated with the BRSF are concentrated in Santa Rosa County
11 and Okaloosa County, Florida, which constitute the ROI for the analysis.

12 BRSF occupies parts or most of 17 townships in Santa Rosa and Okaloosa Counties (FFS, 2000).
13 Other significant public land that surrounds the forest includes the Conecuh National Forest,
14 Eglin AFB, and the Escambia River Tract (FFS, 2000).

15 **Recreation and Tourism**

16 The primary outdoor recreation objective of BRSF is to provide the public with dispersed
17 outdoor recreation activities that are dependent on the natural environment. These activities
18 include swimming, canoeing, hiking, fishing, hunting, nature study, off-road bicycling,
19 horseback riding, picnicking, and camping. In addition, BRSF also manages a number of

1 developed recreation areas with conveniences such as dining halls, boat ramps, horse stables,
 2 flush toilets, running water, picnic tables, and grills.

3 The Forestry Center maintains approximately 600 miles of main forest roads, along with a
 4 nearly equal amount of administrative roads and trails as well as 90 bridges throughout the
 5 forest. This road system provides for public access, supports management activities, and
 6 provides residents with access to their property (FFS, 2000). More information on recreational
 7 activities can be found in Section 5.10, *Land Use*.

8 **Environmental Justice**

9 [Table 5-52](#) lists the percentages of minority,
 10 low-income, and youth populations compared
 11 with the community of comparison (COC)
 12 populations. The COC values represent the
 13 percentages of minority and low-income
 14 populations within a geographic extent
 15 representing the ROI. Locations where the
 16 countywide percentages, or area of concern
 17 (AOC) percentages, are greater than the
 18 statewide percentages, or COC percentages,
 19 are identified as having potential EJ concerns.
 20 As indicated in [Table 5-52](#) and [Figure 5-43](#), the
 21 individual counties and the two-county ROI
 22 have a lower percentage of minority and low-income populations than the state and the
 23 nation. Okaloosa County and Santa Rosa County have a higher percentage of youth
 24 populations than the state but lower than the nation. Noise-sensitive locations, such as
 25 schools and childcare centers, are not located on BRSF; however, there are many recreational
 26 sites located throughout the forest that could be considered noise-sensitive locations.

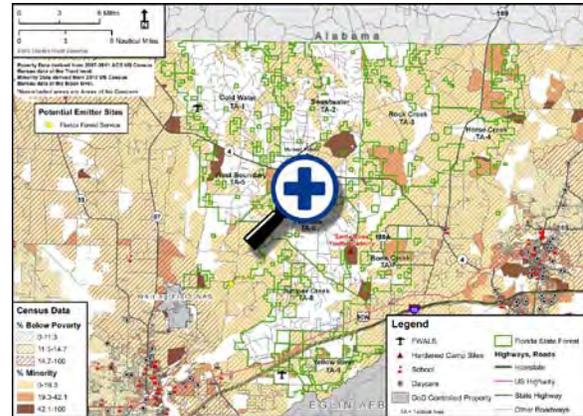


Figure 5-43. Environmental Justice Areas of Concern Near BRSF

Table 5-52. Total Populations and Populations of Concern, 2010

Region	Total Population	Minority (%)	Low-Income ¹ (%)	Youth (%)
Okaloosa County	180,822	22.9%	11.7%	22.3%
Santa Rosa County	151,372	15.0%	10.8%	23.9%
Two-county ROI	332,194	19.3%	11.3%	23.1%
Florida	18,801,310	42.1%	14.7%	21.3%
United States	308,745,538	36.3%	14.3%	24.0%

ROI = region of influence

1. American Community Survey, 5-year estimate, 2007–2011

28 **5.11.2 Environmental Consequences**

29 As discussed in Section 3.11, potential adverse impacts to socioeconomic resources may
 30 occur from safety issues associated with wildfire and land use incompatibility associated with
 31 noise resulting from UoEX and aircraft operations. Other proposed action effectors are not
 32 addressed in this section. Impacts to BRSF socioeconomic and environmental justice
 33 resources identified in Section 5.11.1 would be the same as those described in Section 3.11.

1 Recreation and Tourism

2 As described in Section [2.5](#), scheduling for training activities would constrain the time,
3 frequency, and types of activities to avoid conflicts with hunters, campers, boaters, and other
4 recreational users. Some transient recreational users, such as hikers, may be annoyed by
5 noise from aircraft operations.

6 Environmental Justice and Special Risks to Children

7 As described previously, there would be no significant impact to populations from noise and
8 safety hazards associated with the Proposed Action. Additionally, no other significant
9 impacts for this action have been identified that would impact environmental justice or pose
10 special risks to children.

11 5.11.3 Socioeconomics/Environmental Justice Impact Summary

12 Socioeconomic and environmental justice impacts are tied to those related to noise (Sections
13 [3.3](#) and [5.3](#)), safety (Sections [3.4](#) and [5.4](#)) and land use (Sections [3.10](#) and [5.10](#)). [Table 3-44](#)
14 describes the context, intensity, and duration factors utilized in analysis for socioeconomic
15 and environmental justice impacts; based on these factors the Air Force has identified
16 insignificant impacts to these resource areas and public health and safety and the human
17 environment in general.

18 [Table 5-53](#) summarizes the impacts identified. Impacts are categorized as follows:

- 19 • Adverse (yellow)
- 20 • Neutral/no effect (green)

21 **Table 5-53. Socioeconomics/Environmental Justice Impacts Summary – BRSF**

Proposed Action Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section 3.11).								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section 3.11).								
Dismounted movement									
Use of Expendables									
Blanks/GBS	Potential adverse impacts to the public associated with increased wildfire potential and noise. Impacts would be mitigated through implementation of General Operational Constraints identified in Section 2.5 , as well as Proposed Resource-Specific Mitigations described in Sections 3.3/5.3 (Noise) and Sections 3.4/5.4 (Safety). Such mitigations include avoidance of noise-sensitive areas and adherence to wildfire management requirements.								
Smoke grenades									
Other/equipment									
Aircraft Operations	Potential adverse impacts to the public associated with noise from aircraft operations (see Sections 3.3 and 5.3 , Noise). Impacts would be mitigated through operational constraints described in Section 2.5 and Proposed Resource-Specific Mitigations described in Section 5.3 , Noise), such as use of avoidance areas and other flight constraints.								
Amphibious Operations	The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section 3.11).								

1 **5.11.4 Proposed Resource-Specific Mitigations**

2 No additional Resource-Specific Mitigations for socioeconomics and environmental justice
3 have been identified as a result of analyses in this chapter.

4 **5.12 SOLID AND HAZARDOUS MATERIALS/WASTE**

5 **5.12.1 Affected Environment**

6 No hazardous materials or hazardous or petroleum wastes would be generated at most BRSF
7 sites, because no industrial activities would occur at these sites. The only exceptions are the
8 Molino, Youngstown, and White City sites. At these locations, personnel would perform
9 limited maintenance of vehicles and equipment, primarily consisting of oil and fluid changes.
10 Consequently, hazardous materials stored at these sites include small quantities (55-gallon
11 containers or smaller) of lubricating oil, hydraulic fluid, antifreeze, solvents, and paints.
12 Wastes generated would include waste and solvents. All materials and wastes would be
13 managed according to established FFS requirements. These requirements include the use of
14 secondary containment and the availability of spill response equipment.

15 Additionally, the affected environment would comprise FFS requirements regarding the use
16 and management of hazardous materials and wastes.

17 **5.12.2 Environmental Consequences**

18 As discussed in Section [3.12.3](#), no adverse impacts to public health and safety and the human
19 and natural environment associated with solid and hazardous material or waste would occur
20 from training activities. All activities would comply with applicable federal, state, and local
21 regulations. As a result, this resource area is not discussed further in this chapter.

22 **5.13 INFRASTRUCTURE AND TRANSPORTATION**

23 **5.13.1 Affected Environment**

24 Based on the limited interaction between training activities and utilities and transportation
25 resources, discussion of the affected environment for infrastructure at BRSF is general in
26 nature.

1 **5.13.1.1 Utilities**

2 Due to the size of BRSF and the existence of a significant acreage of private inholdings,
3 numerous utility corridors (i.e., power lines, gas pipelines) are found within the Forest (BRSF,
4 2013). Additionally, most of the developed recreation area campsites have electricity, water,
5 and flush toilets. The STOP Camp and SRYA sites also have available electricity, water, and
6 natural gas. Wastewater at these sites is handled via septic tank.

7 **5.13.1.2 Transportation**

8 The local and regional road network between Eglin AFB/Hurlburt Field and the BRSF is well
9 developed. The key transportation routes include State Road (SR) 85, U.S. Highway (US) 90,
10 and SR 4. From Eglin AFB, SR 85 is a four-lane route north to Crestview where it intersects
11 US 90. From Crestview west, US 90 is a four-lane divided route that transitions to two lanes
12 just east of the Yellow River. SR 4 intersects with US 90 just west of the Yellow River and is a
13 two-lane road that cuts through the middle of BRSF. PJ Adams Parkway/Antioch Road is
14 available as a by-pass around downtown Crestview, running from SR 85 to US 90. Numerous
15 developed and undeveloped roads are located within BRSF.

16 **5.13.2 Environmental Consequences**

17 As discussed in Section [3.13.2](#), no adverse impacts to public health and safety or the human
18 and natural environment associated with utilities usage or use of transportation resources
19 would occur from training activities. All activities would comply with applicable federal, state,
20 and local regulations. As a result, this resource area is not discussed further in this chapter.

21 **5.14 BLACKWATER RIVER STATE FOREST IMPACT SUMMARY**

22 [Table 5-54](#) provides a summary of impact determinations associated with training activities,
23 for potentially affected resources based on analyses presented in Chapter [3](#), Sections [3.2](#)
24 through [3.13](#), and Chapter [5](#), Sections [5.2](#) through [5.13](#). A “dot” in a cell indicates an
25 interaction between the training activity and the respective resource. Impacts are
26 categorized as follows:

- 27 • Adverse (yellow) – Potential impact to public health and safety, the human and natural
28 environment, and/or potential violation of federal, state, or local regulations
- 29 • Neutral/no effect (green)

30 Adverse, insignificant impacts have been identified and are described in detail in the
31 respective resource area chapters.

1

Table 5-54. BRSF Impact Summary

Proposed Action Component	Resource Area Potentially Affected											
	Airspace (3.2/5.2)	Noise (3.3/5.3)	Safety (3.4/5.4)	Air Quality (3.5/5.5)	Earth Resources (3.6/5.6)	Water Resources (3.7/5.7)	Biological Resources (3.8/5.8)	Cultural Resources (3.9/5.9)	Land Use (3.10/5.10)	Socioeconomics/ Environmental Justice (3.11/5.11)	Haz/Solid Materials & Waste (3.12/5.12)	Infrastructure (3.13/5.13)
HLZs/DZs		•	•	•	•	•	•	•	•	•	•	•
FWALS		•	•	•	•	•	•	•	•	•	•	•
Use of Expendables		•	•	•	•	•	•	•	•	•	•	•
Light Aviation Proficiency Training	•	•	•	•	•	•	•	•	•	•	•	•
Low-Level Helicopter Insertions/Extractions (LLHI/E)	•	•	•	•	•	•	•	•	•	•	•	•
Temporary Combat Support Areas					•	•	•	•			•	
Airdrops	•	•	•	•	•	•	•	•	•	•	•	•
Air/Land Vertical Lift	•	•	•	•	•	•	•	•	•	•	•	•
FARP/HGO						•					•	
Cross Country Dismounted Movements					•	•	•	•	•	•	•	•
Cross Country Vehicle Movement		•	•	•	•	•	•	•	•	•	•	•
Vehicle Stream and Wetland Crossing		•	•	•	•	•	•	•	•	•	•	•
Blackout Driving		•	•	•	•	•	•	•	•	•	•	•
Emplacement of Obstacles					•	•	•	•	•	•	•	•
Bivouacking/ Assembly Areas				•	•	•	•	•	•	•	•	•
Communications and Surveillance Operations				•	•	•	•	•	•	•	•	•
Amphibious Operations		•	•	•	•	•	•	•	•	•	•	•
Natural Resource Consumption					•	•	•	•	•	•	•	•
Overwater Hoist Operations	•	•	•	•	•	•	•	•	•	•	•	•
Opposing Forces Vehicle Operations	•	•	•	•	•	•	•	•	•	•	•	•
Hardened Camp Site Use											•	•

1 The analyses in these sections were conducted based on effectors associated with training
2 activities (as identified in [Table 3-1](#) in and their impacts on receptors identified in [Table 3-2](#) in
3 Chapter 3, the impact summary provided in [Table 5-54](#) ties those two tables together and
4 identifies the degree of impact to affected resources associated with specific training
5 activities as described in Section [2.3.2](#). This allows the reader to understand the potential
6 impacts associated with specific training activities.

7 Proposed Resource-Specific Mitigations applicable to both BRSF and THSF resulting from
8 general analysis were previously identified in Section [3.14.1](#). Additional Proposed Resource-
9 Specific Mitigations identified through analysis in this chapter are provided in Section 5.14.1
10 that would serve to further minimize or avoid any identified adverse impacts.

11 **5.14.1 BRSF Proposed Resource-Specific Mitigations**

12 Based on the scope of activities associated with the Proposed Action, the inherent General
13 Operational Constraints identified in Section [2.5](#), and related impact analyses detailed in this
14 EIS, the following Proposed Resource-Specific Mitigations have been identified to further
15 minimize or avoid adverse impacts—in most cases impacts would be minimized such that
16 impact levels would be reduced from “Adverse” (yellow) to “Neutral” or “No Effect” (green).

17 **Noise**

- 18 • A/LVL training will not be conducted at the proposed FWALS in TA-9 and aircraft
19 inbound to and outbound from the FWALS would avoid overflying privately-owned
20 parcels with residential structures where practicable.
- 21 • Aircraft would approach Munson/Blackwater Airstrip from the north only.
- 22 • Aircraft departing Munson/Blackwater would initiate takeoff roll from about the center
23 point of the airstrip.
- 24 • The Air Force would notify residents within 4,000 feet of the SRYA or former STOP
25 camp prior to use of munitions.

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6. TATE'S HELL STATE FOREST AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

6.1 INTRODUCTION

This chapter addresses the receptors identified in Chapter 3 (the Affected Environment) specific to THSF and the impacts (the Environmental Consequences) on those receptors by the various effectors associated with the Proposed Action. As discussed in Chapter 3, Section 3.14, some resource areas would experience no interaction with this activity, or general impact analyses in Sections 3.2–3.13 have shown that there would be negligible or no impacts to a specified resource area, despite the site-specific nature of the resources. Additionally, in some cases the general analyses provided in Chapter 3 are sufficient to determine the extent of impacts on site-specific resources in that the general analysis is applied to the site-specific resources identified as the affected environment.

As noted in previous chapters, analyses rely heavily on previous NEPA documentation for similar activities within similar environments; these documents are incorporated by reference in certain sections where applicable, and are noted. Finally, the affected environment discussions provide information regarding the types of resources present; however, to avoid encyclopedic repetition of publicly available information the reader is directed to locations outside this document for such information should the reader desire it. As an example, the fact that sensitive species are present on THSF is addressed and types, quantities and locations (where applicable and allowed by law) are described. However, as discussion of each individual species in terms of physical description and foraging/reproductive aspects are encyclopedic and readily available from various sources, the reader is directed to a location (e.g., the USFWS or FNAI website) for this information. This is in keeping with 40 CFR requirements.

Training activity impact analyses consider the General Operational Constraints provided in Section 2.5. These are based on the establishment of the Protection Levels identified in Table 2-24 as well as the noise protection levels resulting from impact analysis in Section 3.3 and presented in Table 2-25. The following Figure 6-1 through Figure 6-11 provide graphical representation of the protection levels for ground operations at THSF as a whole, and for each individual tactical area. Figure 6-12 through Figure 6-22 provide similar information for noise-generating activities at THSF. Each map is a “clickable” thumbnail image that will provide full-screen viewing; each map is also available for full-page printing in Appendix A.

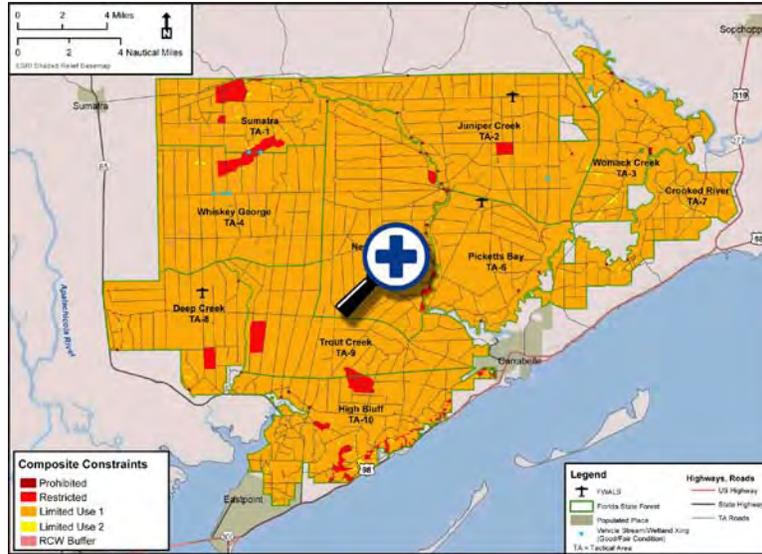


Figure 6-1. THSF Ground Operations Protection Levels

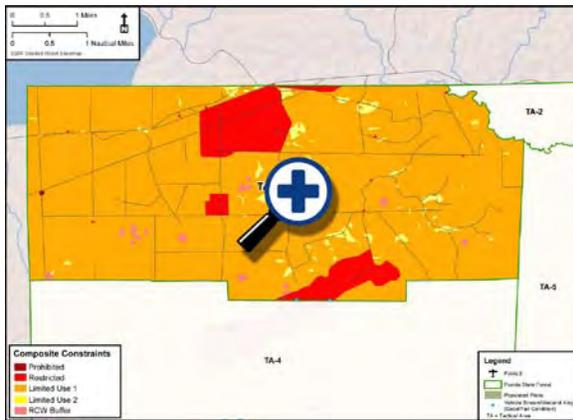


Figure 6-2. THSF TA-1 Ground Operations Protection Levels

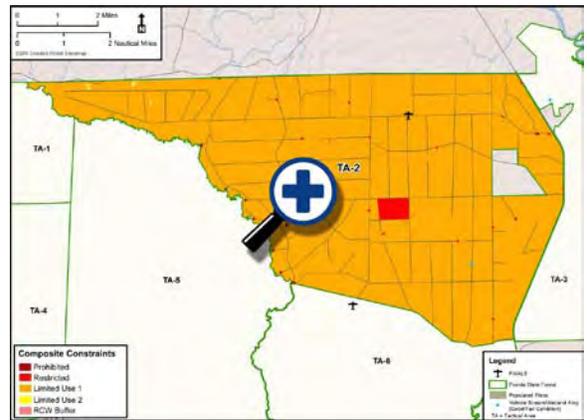


Figure 6-3. THSF TA-2 Ground Operations Protection Levels

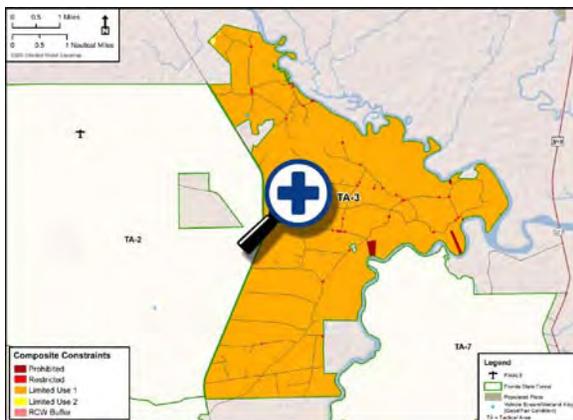


Figure 6-4. THSF TA-3 Ground Operations Protection Levels

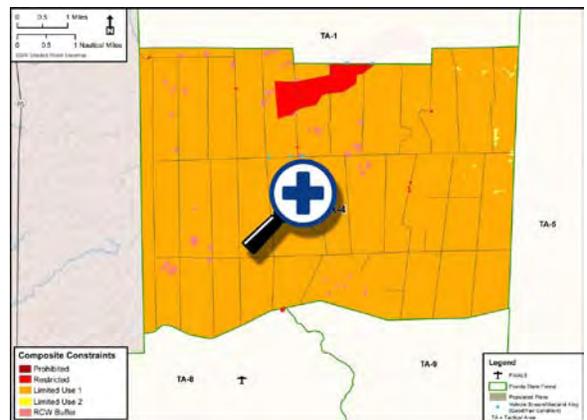


Figure 6-5. THSF TA-4 Ground Operations Protection Levels

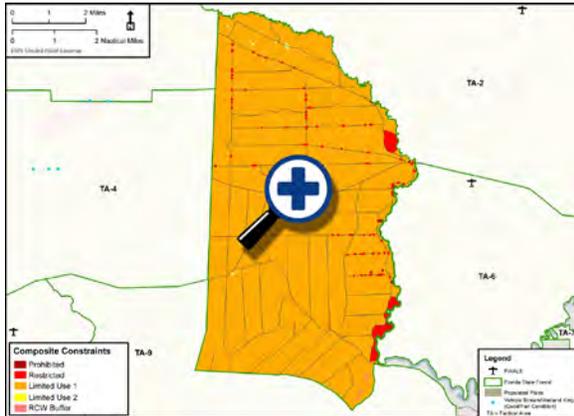


Figure 6-6. THSF TA-5 Ground Operations Protection Levels

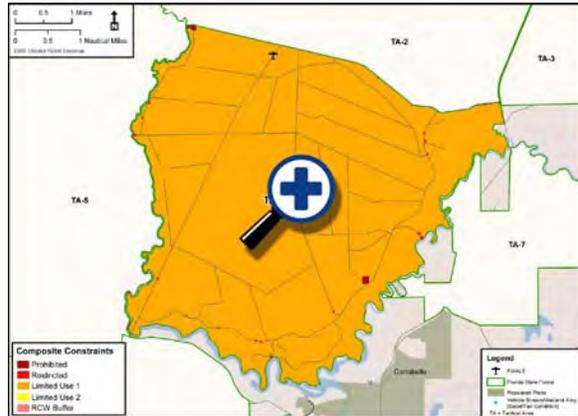


Figure 6-7. THSF TA-6 Ground Operations Protection Levels

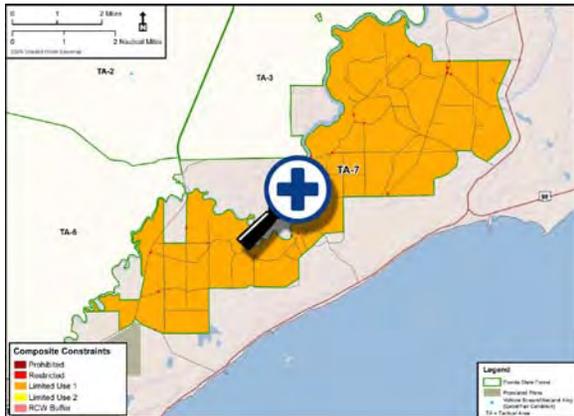


Figure 6-8. THSF TA-7 Ground Operations Protection Levels

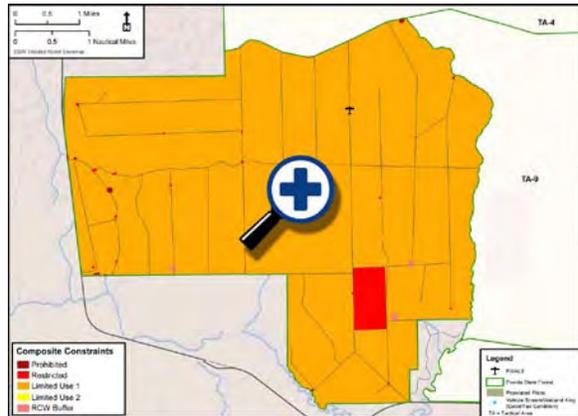


Figure 6-9. THSF TA-8 Ground Operations Protection Levels

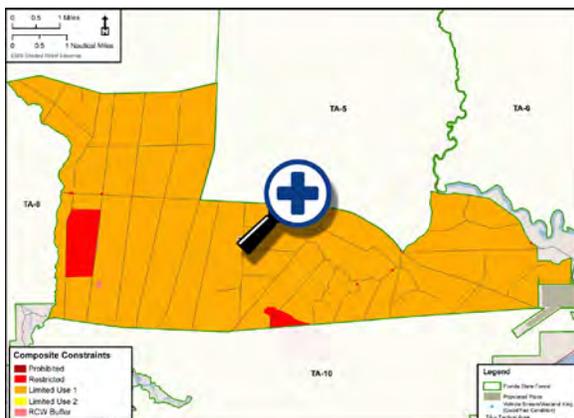


Figure 6-10. THSF TA-9 Ground Operations Protection Levels

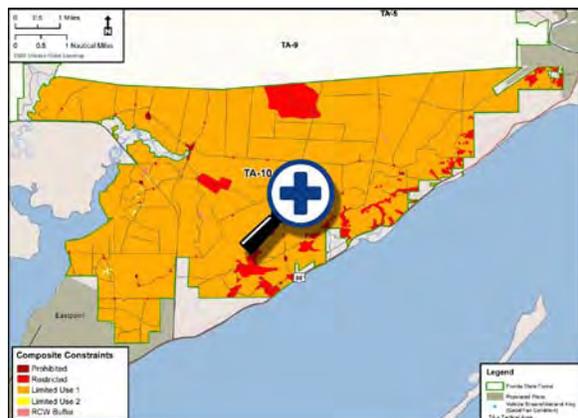


Figure 6-11. THSF TA-10 Ground Operations Protection Levels

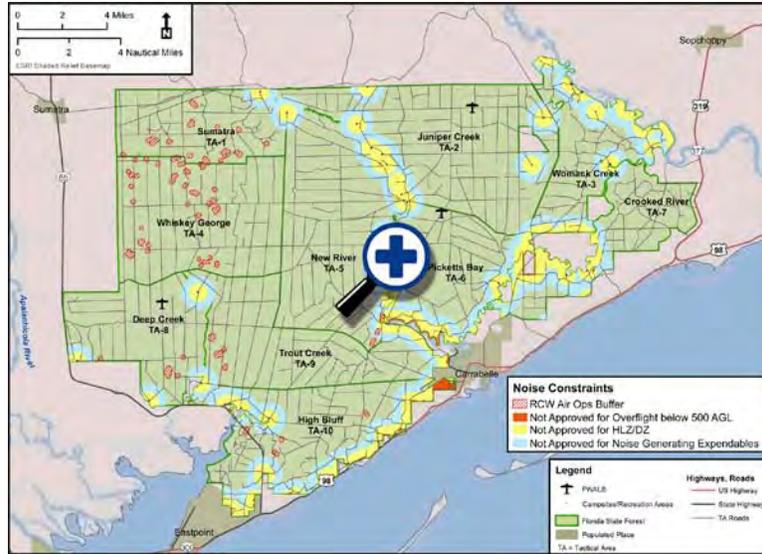


Figure 6-12. THSF Noise Protection Levels Overview

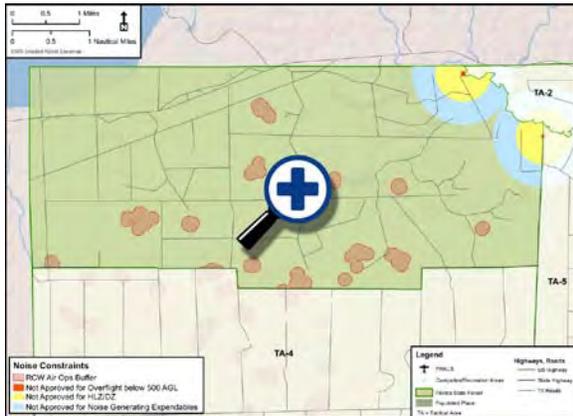


Figure 6-13. THSF TA-1 Noise Protection Levels



Figure 6-14. THSF TA-2 Noise Protection Levels



Figure 6-15. THSF TA-3 Noise Protection Levels

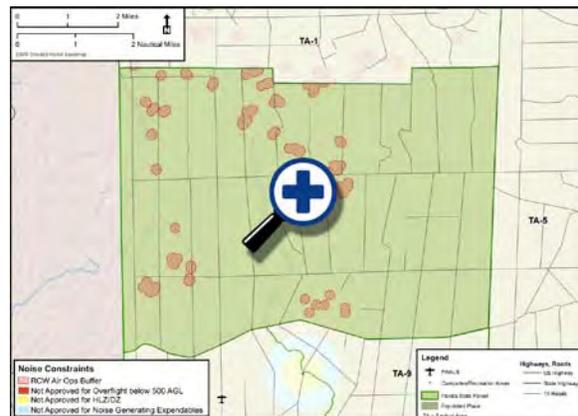


Figure 6-16. THSF TA-4 Noise Protection Levels

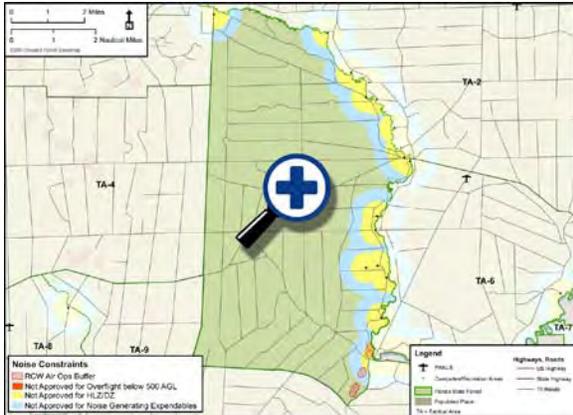


Figure 6-17. THSF TA-5 Noise Protection Levels



Figure 6-18. THSF TA-6 Noise Protection Levels

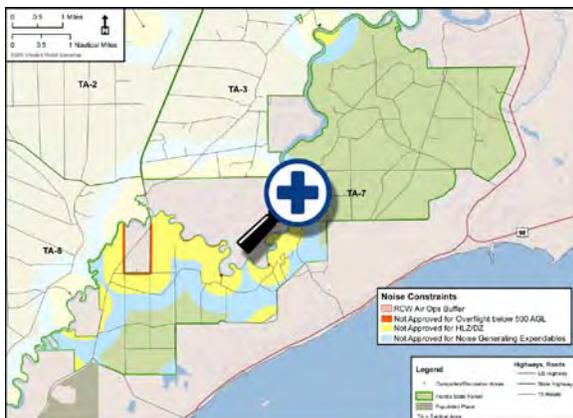


Figure 6-19. THSF TA-7 Noise Protection Levels

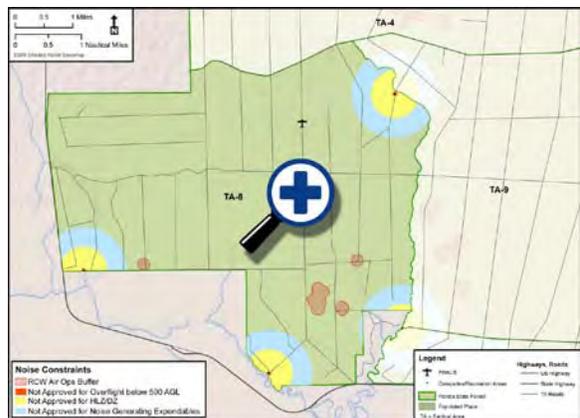


Figure 6-20. THSF TA-8 Noise Protection Levels



Figure 6-21. THSF TA-9 Noise Protection Levels

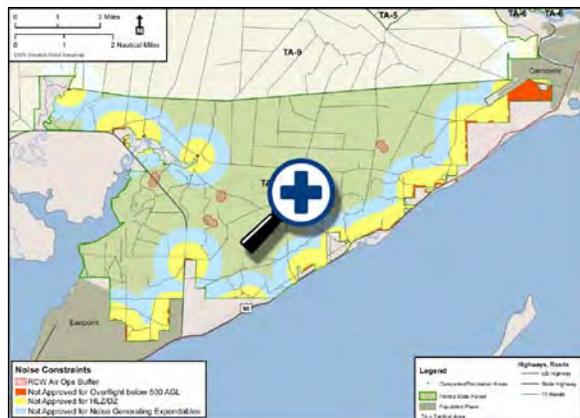


Figure 6-22. THSF TA-10 Noise Protection Levels

1 The surface area of THSF covered by the various protection levels per tactical area is provided
 2 in [Table 6-1](#).

3 **Table 6-1. THSF Protection Level Coverage**

Protection Level	Tactical Area										THSF Total
	1	2	3	4	5	6	7	8	9	10	
Ground Operations Protection Levels											
Prohibited											
Acres ¹	3	13	56	<1	12	20	<1	10	<1	62	176
% of Area ¹	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Restricted											
Acres ¹	1,255	253	0	598	326	0	307	715	1,472	4,926	
% of Area ¹	8	<1	0	2	1	0	2	3	6	2	
RCW (200-foot buffer)											
Acres ¹	157	0	260	22	0	51	55	31	576		
% of Area ¹	1	0	1	<1	0	<1	<1	<1	<1		
LU-1											
Acres ¹	13,394	31,012	13,789	24,067	28,815	16,810	13,142	16,164	20,309	21,021	198,523
% of Area ¹	90	99	98	97	99	99	99	98	97	92	97
LU-2											
Acres ¹	176	58	166	117	30	35	193	48	5	347	1,176
% of Area ¹	1	<1	1	<1	<1	<1	1	<1	<1	2	<1
Noise Protection Levels											
Not Approved for Aircraft Overflights below 500 AGL											
Acres ¹	3	28	38	0	22	119	77	7	26	356	676
% of Area ¹	<1	<1	<1	0	<1	<1	<1	<1	<1	2	<1
Not Approved for HLZs/DZs											
Acres ¹	336	3,381	2,249	0	2,202	2,403	2,184	642	916	4,165	18,478
% of Area ¹	2	11	16	0	8	14	16	4	4	18	9
Not Approved for Noise Generating Expendables											
Acres ¹	996	5,958	6,529	0	5,270	5,459	4,615	1,935	2,225	9,240	42,227
% of Area ¹	7	19	47	0	18	32	35	12	10	40	21
RCW Air Operations Buffer²											
Acres ¹	581	0	1,047	104	1	0	163	180	141	2,216	
% of Area ¹	4	0	4	<1	<1	0	<1	<1	<1	1	

AGL = above ground level; LU = Land Use; RCW = red-cockaded woodpecker; THSF = Tate's Hell State Forest

1. Acreages and percentages are rounded to the nearest whole number unless value is less than 1%, in which case value is indicated as <1%.

2. Represented by red hatched areas on [Figure 6-12](#) through [Figure 6-22](#).

4 6.2 AIRSPACE MANAGEMENT AND USE

5 6.2.1 Affected Environment

6 Airspace over THSF is less heavily utilized than airspace over BRSF. As is the case with BRSF,
 7 Jacksonville ARTCC manages air traffic while en route and RAPCON/TRACON facilities take
 8 over management responsibility for aircraft in their respective terminal areas.

6.2.1.1 Military Training Airspace

THSF underlies Tyndall E and G MOAs (see [Figure 6-23](#)). Tyndall E MOA has a floor altitude of 300 feet AGL while Tyndall G MOA has a floor altitude of 1,000 feet AGL. Both MOAs have a ceiling altitude up to but not including 18,000 feet MSL. MOA usage is intermittent between sunrise and sunset Monday through Friday. The Tyndall MOAs are expected to be used for approximately 5,000 sorties per year in calendar year 2014 (U.S. Air Force, 2011a). Both MOAs are managed by the 325 OSS/OSOS at Tyndall AFB, Florida.

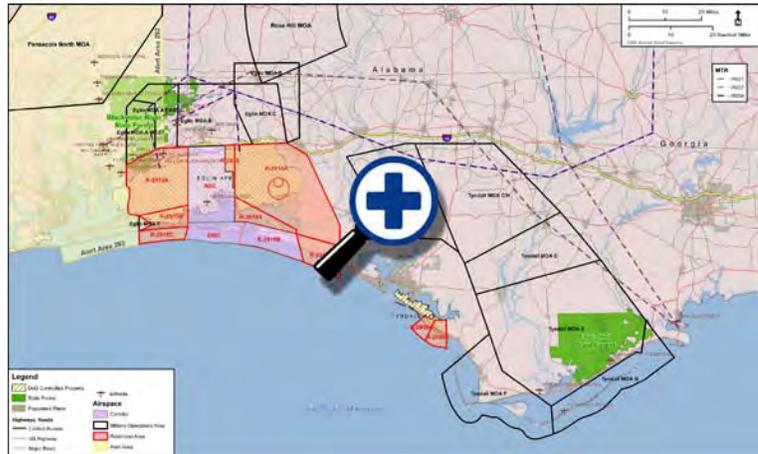


Figure 6-23. Special Use Airspace Units and Airfields

Both MOAs are managed by the 325 OSS/OSOS at Tyndall AFB, Florida.

6.2.1.2 Airfields and Transiting Aircraft

Airfields located in or near THSF are listed in [Table 6-2](#) with the approximate number of airfield operations flown per year currently. The locations of the airfields are shown in [Figure 6-23](#). Apalachicola, the busiest of the airports near THSF, supports 24,347 airfield operations per year. The other airports support fewer operations. Class E Airspace associated with Carrabelle Thompson Airport extends to 5 NM from the airport and to altitudes of 1,500 feet AGL. This airspace overlies a portion of THSF.

Table 6-2. Airfields Near THSF

Airfield Name	Approximate Annual Airfield Operations
Apalachicola Municipal Airport	24,375
Carrabelle-Thompson Airport	524
Saint George Island Airport	500
Wakulla County Airport	5,710

The FFS conducts aircraft operations over THSF as part of controlled burns, aerial surveys, and other operations. The frequency of these flights is variable from one season to the next depending on the number of prescribed burns conducted and other factors. (Colburn, 2013). There are six helispots designated at THSF.

6.2.2 Environmental Consequences

As discussed in Section [3.2](#), airspace management and use would only be potentially adversely affected by aircraft operations. Other proposed action effectors are not addressed in this section.

1 Several of the GLI training event types would include or consist entirely of aircraft operations.
2 As many as nine sorties per annual average day could be conducted over THSF, and each
3 sortie would include up to four aircraft. Section [2.3](#) describes types of GLI training events,
4 including the expected frequency of occurrence. GLI training would operate in compliance
5 with all federal aviation regulations and would not require segregation from nonparticipating
6 aircraft. No new SUA or modifications to existing SUA would be required. Existing non-SUA
7 airspace boundaries would not need to be altered to support proposed GLI training.

8 **6.2.2.1 Scheduling/Coordination**

9 THSF is overlain by Tyndall E and G MOAs. The floor altitude of Tyndall G MOA is 300 feet AGL,
10 and GLI training would occur frequently above this altitude. Tyndall G MOA has a floor
11 altitude of 1,000 feet AGL, and fewer GLI aircraft operations would be expected to require use
12 of this airspace volume. Coordination with the 325 Operational Support Squadron, the
13 agency managing the Tyndall MOAs, would be conducted prior to use of the MOAs when the
14 MOAs are active. The MOAs are not active after sunset, which is when approximately 50
15 percent of GLI training would take place.

16 As discussed in Sections [1.3](#) and [1.4](#), scheduling concerns at the Eglin Range would be
17 reduced as a result of the Proposed Action. This is because the Proposed Action would
18 relocate nonhazardous training operations from the Eglin Range, thereby allowing continued
19 growth in the testing and training missions conducted there.

20 A new process would be implemented by which the Air Force would coordinate GLI training
21 missions with THSF to ensure de-confliction with forest activities. This coordination would be
22 a new process.

23 **6.2.2.2 Efficiency of Ongoing Operations**

24 Tyndall MOAs are used much less frequently than other MOAs in the region (U.S. Air Force,
25 2011a). As mentioned previously, about 50 percent of GLI training is expected to take place
26 after dark. The Tyndall MOAs are activated only intermittently between sunrise and sunset.
27 An incremental increase in the usage rate of Tyndall E and G would not be expected to result
28 in scheduling conflicts that would reduce the efficiency of ongoing operations.

29 GLI training would be conducted primarily in Class G uncontrolled airspace. All participating
30 and nonparticipating aircraft would operate using see-and-avoid procedures. Any GLI aircraft
31 operations entering Carrabelle Thompson Airport Class E airspace would not be expected to
32 overwhelm the capacity of the airport, which currently conducts about 524 airfield operations
33 annually (less than two per day).

34 Air Force staff would coordinate with THSF POCs to ensure that the efficiency of ongoing FFS
35 would not be negatively affected by GLI training. So long as the coordination is carried out in
36 accordance with the proposed agreement between the Air Force and FFS, no conflicts
37 between the operations of the two organizations should occur.

38 **6.2.3 Airspace Impact Summary**

39 [Table 3-4](#) describes the context, intensity, and duration factors utilized in analysis for impacts
40 to airspace; based on these factors the Air Force has identified insignificant adverse impacts

1 to public safety and the human environment. Overall, impacts to airspace management
 2 would be moderate. Impacts would be regional, affecting Eglin Range as well as the airspace
 3 above THSF, and long term, with the increase in air traffic tempo lasting as long as GLI
 4 training continues. Impacts would include both positive impacts (i.e., reduced scheduling
 5 conflicts at Eglin Range) and negative impacts (i.e., increased air traffic in controlled and
 6 uncontrolled airspace over THSF). Although the number of sorties using Tyndall MOAs would
 7 be expected to increase, about 50 percent of GLI training operations would occur after sunset
 8 when the Tyndall MOAs are not active. Implementation of a coordination process between
 9 the Air Force and FFS would avoid potential operational conflicts that otherwise could have
 10 been considered severe impacts. Impacts to other ongoing operations would be expected to
 11 be minor as other operations could continue to transit the area normally while GLI training is
 12 under way.

13 [Table 6-3](#) summarizes the impacts identified. Impacts are categorized as follows:

- 14 • Adverse (yellow)
- 15 • Neutral/no effect (green)

16 **Table 6-3. Airspace Impacts Summary – THSF**

Proposed Action Effector	Airspace Management Impacts	
	Scheduling/Coordination	Efficiency of Ongoing Operations
Aircraft Operations	The number of sorties using Tyndall MOAs would be expected to increase requiring increased scheduling workload. New coordination process would be implemented between Air Force and FFS to avoid operational conflicts.	Increased air traffic primarily at low altitudes over THSF. See-and-avoid procedures used in uncontrolled airspace. Minor increases in ATC workload generated by any aircraft entering Carrabelle Thompson Airport Class E airspace. Coordination between Air Force and FFS would avoid operational conflicts.

ATC = air traffic control; FFS = Florida Forest Service; MOA = military operations area; THSF = Tate's Hell State Forest

17 6.2.4 Proposed Resource-Specific Mitigations

18 No additional Resource-Specific Mitigations for airspace management have been identified.
 19 All General Operational Constraints (Section [2.5](#)) and Proposed Resource-Specific Mitigations
 20 identified in Section [3.2.4](#) would sufficiently minimize any identified adverse impacts (yellow),
 21 mitigating them to beneficial or no effect (green).

22 6.3 NOISE

23 6.3.1 Affected Environment

24 Noise levels in THSF are similar to those described for BRSF in Section [5.3.1](#), and ambient noise
 25 levels are assumed to be 45 dB DNL. The Tyndall MOAs located above THSF are used for
 26 approximately 5,000 sorties per year. These sorties are primarily conducted by F-22 and T-38
 27 aircraft based at Tyndall AFB. Although the floor altitude of Tyndall E and G MOAs are 300
 28 feet AGL and 1,000 feet AGL, respectively, F-22 and T-38 aircraft operate at higher altitudes.
 29 [Table 6-4](#) lists individual overflight noise levels for F-22 and T-38C aircraft. Under current

- 1 conditions, military aircraft training generates noise levels below 45 DNL_{mr} beneath Tyndall F
 2 MOA and at about 67 dB DNL_{mr} beneath Tyndall G MOA (U.S. Air Force, 2011b).

3 **Table 6-4. SEL Under the Flight Track for Aircraft Commonly Operating Above THSF**

Aircraft	SEL in dB ¹			Power	Speed (kts)
	500 feet AGL	1,000 feet AGL	10,000 feet AGL		
F-22	114	108	84	70% ETR	449
T-38	92	86	60	91% RPM	449
F-35A ²	127	120	94	95% ETR	475
Single-engine, propeller-driven aircraft	84	79	61	70% RPM	160
UH-1	96	91	73	100% RPM	80

AGL = above ground level; ETR = engine thrust request; kts = knots; RPM = revolutions per minute; SEL = sound exposure level; THSF = Tate's Hell State Forest

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010)

- 4 Civilian aircraft operations over THSF include FFS single-engine propeller driven aircraft and
 5 UH-1 aircraft. [Table 6-5](#) lists noise levels for these two aircraft.

6 **Table 6-5. Comparative SEL Under the Flight Track for Aircraft Commonly Operating Above**
 7 **THSF**

Aircraft Category	Aircraft type	SEL in dB ¹			Power	Speed (kts)
		500 feet AGL	1,000 feet AGL	10,000 feet AGL		
Aircraft types To be used in GLI training	2-engine, propeller-driven ²	84	79	62	100% RPM	200
	CV-22	94	90	72	60 degrees nacelle tilt	150
	H-60	91	87	N/A	LFO Lite 140 kts	140
	C-130H	95	90	67	800 CTIT	180
	H-47	87	82	60	Flyover at 120 kts	120
Aircraft types operating currently used over THSF	F-22	114	108	84	70% ETR	449
	T-38	92	86	60	91% RPM	449
	F-35A ²	127	120	94	95% ETR	475
	Single-engine, propeller-driven aircraft	84	79	61	70% RPM	160
	UH-1	96	91	73	100% RPM	80

AGL = above ground level; ETR = engine thrust request; GLI = GRASI Landscape Initiative; kts = knots; LFO Lite 140 kts = helicopter in level flight at 140 knots; RPM = revolutions per minute; SEL = sound exposure level; THSF = Tate's Hell State Forest

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity)

2. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010).

6.3.2 Environmental Consequences

As discussed in Section 3.3, adverse impacts may potentially occur from UoEX and aircraft operations. Other proposed action effectors are not addressed in this section.

Aircraft and ground vehicles would follow variable routes to and from training locations in the state forest. Aircraft en route typically operate at or above 500 feet AGL unless operating within existing special use airspace. Areas outside the state forest would occasionally experience aircraft and surface vehicle noise at levels listed in Table 3-9 and Table 3-13 generated by vehicles en route. However, because routing would vary from one training mission to the next, overflight/pass-by of any given location would be infrequent, and noise impacts outside the state forests would be minimal.

6.3.2.1 Aircraft Operations

At THSF, as many as nine sorties per annual average day would be conducted as part of LAPT, LLHI/E, AD, A/LVL, and OHO training. Each training event could include up to four aircraft but would include only one or two aircraft under normal circumstances. The experience of a person on the ground would be as described in Section 5.3.2.1 for BRSF. As would be the case at BRSF, about 20 percent of total annual operations would occur at least partially after 10:00 PM with the majority of these late-night operations taking place in summer months when the sun sets later. Operations noise, whether it is generated by a direct overflight or training at a distance, could be disruptive of activities (e.g., conversation, sleeping) and could be considered annoying. Several HLZ/DZs would be established, and any given training locations would be used for less than one training event per day on average. HLZ/DZs would be located at greater than 2,200 feet from known noise-sensitive locations. Under a conservative set of assumptions, which are described in Section 3.3.3 and in more detail in Appendix H (Section H.3), noise levels exceeding 55 dB DNL would not affect any known noise-sensitive locations. Several aircraft currently operating in the airspace above THSF, such as the F-22 and T-38, generate noise levels higher than those typically generated by aircraft that would be involved in GLI training. The aircraft utilized as part of GLI would be of similar type and generate similar noise levels to those listed in Table 6-5.

Aircraft maneuvering at THSF would vary flight paths from one mission to the next. Assuming less than one hour is spent maneuvering per training event, and using the CH-47D Chinook as a representative noise source for all GLI aircraft, distributed flying operations would generate less than 45 dB DNL_{mr}.

Three dirt FWALS would be established at THSF under the Proposed Action; these would be used for practice approaches by light propeller-driven aircraft. As shown in Figure 2-11 through Figure 2-13, the locations of the proposed FWALS at THSF are geographically remote. Noise levels would not be expected to exceed 55 dB DNL at distances greater than 9,267 feet from the FWALS and would not exceed 65 dB DNL at distances greater than 1,186 feet from the FWALS. These distances were calculated for a scenario where all proposed LAPT operations occur at a single FWALS and yield a very conservative estimation of impacts.

No known noise-sensitive locations or privately owned parcels of land are located within 9,267 feet of the proposed THSF FWALS. Noise generated by operations at the FWALS may be annoying to transient users that happen to be near the FWALS (e.g., hunters) during

1 operations. However, overflights of light aircraft would be infrequent, and the noise
2 generated would be similar to that generated by other propeller-driven aircraft noise heard in
3 the area currently. When conditions at the FWALS become less than ideal for training (e.g.,
4 when growth of surrounding trees make landing and takeoff unsafe), the FWALS would be
5 replaced. Replacement FWALS would be selected in geographically remote areas similar to
6 those selected for the initial three proposed THSF FWALS. New FWALS would not be sited
7 within 9,300 feet of campgrounds or privately owned parcels. At this distance, noise impacts
8 associated with operations at new FWALS would be expected to be minimal.

9 At THSF there would be about one training event per day on average at HLZs/DZs conducting
10 LLHI/E, AD, and A/LVL once GLI training is at full capacity. Based on analyses presented in
11 Section [3.3.3](#), noise levels exceeding 55 dB DNL would not be expected to occur at greater
12 than 200 feet from approach/departure paths and 2,200 feet from the HLZ/DZ. To avoid
13 excessive annoyance, HLZs/DZs, including run-in paths, should be sited no closer than these
14 distances to known noise-sensitive locations (e.g., campgrounds, privately owned parcels
15 with residences).

16 OHO would take place at surveyed locations in open water at THSF up to once per month.
17 Per Section [3.3.3](#), individual OHO operations could be annoying to people located nearby. To
18 mitigate excessive annoyance, OHO hover locations should not be sited within 2,200 feet of
19 known noise-sensitive locations, the same distance applied to HLZs/DZs.

20 **6.3.2.2 Munitions Use**

21 At THSF, firing of blank rounds and detonation of ground burst simulators would be
22 permitted anywhere, subject to restrictions described later in this section. Paintball/plastic
23 pellets and smoke grenades would be used at other locations, but these expendables
24 generate minimal noise. An estimated 576,000 blank 5.56-mm rounds (8,000 per event),
25 196,200 blank 7.62-mm rounds (10,000 per event), would be fired annually. Blank rounds do
26 not fire a bullet and are quieter than live rounds. Ground burst simulators (GBSs) are
27 designed to sound similar to artillery rounds detonating. Two to five GBSs would be used per
28 event, for a total of up to 5,172 annually.

29 As described in Army Regulation 200-1, noise-sensitive land uses are discouraged where small
30 arms noise exceeds 87 dB PK 15(met) and strongly discouraged where small arms noise
31 exceeds 104 dB PK 15(met). Army Regulation 200-1 discourages noise-sensitive land use
32 where large arms noise exceeds 62 dB CDNL and strongly discourages noise-sensitive land
33 uses where large-arms noise exceeds 70 dB CDNL. [Table 3-12](#) lists distances from the training
34 location at which gunfire noise levels drop below these threshold levels. Noise levels are
35 presented for a location 90 degrees to the right of the direction of firing. For the purposes of
36 analysis, it was assumed that all GBS use would be evenly distributed among two locations at
37 THSF. In fact, GBS use would be more widely distributed, so that GBS noise would be
38 experienced infrequently at any given location. Calculated distances to threshold noise levels
39 are conservative estimates of actual noise levels. To minimize adverse levels of noise and
40 annoyance levels, use of noise-generating expendables would be restricted within 4,000 feet
41 of noise-sensitive receptors.

6.3.2.3 Ground Vehicle Operations

As discussed in Section 3.3.3, ground vehicle operations (e.g., CCVM, VSWC, BD, and OFVO) may generate noise that is annoying to people in the state forest or private inholdings, particularly when it occurs at night. Noise levels generated by two of the loudest vehicles expected to be used during GLI training are listed in Table 3-13. Ground vehicles used in GLI training would be equipped with exhaust mufflers in compliance with Florida Statutes. Training would occur along roads that are used currently by heavy trucks (e.g., logging trucks) and other traffic. Noise impacts would be localized to the area where ground vehicles are operating and would be limited to the duration of the training event.

6.3.2.4 Amphibious Operations

AO would involve up to six watercraft equipped with motors up to 200 hp. These boats would generate noise that could be considered disruptive and annoying by people along the banks of the water body being used. The boats would be of a similar size and engine power to boats currently used on the same water bodies and would not be expected to exceed noise level thresholds established in Florida Statutes. During covert training operations in confined water bodies, full throttle would be expected to be used rarely, limiting the intensity of noise generated. This type of training could occur up to 10 times per year in water bodies where motor-powered boats are currently permitted. Noise impacts would be expected to be temporary, lasting the duration of the training exercise.

6.3.3 Noise Impact Summary

Table 3-7 describes the context, intensity, and duration factors utilized in analysis of impacts to noise receptors; based on these factors the Air Force has identified insignificant adverse noise-related impacts to public health and safety and the human and natural environment. Noise associated with aircraft operations and munitions use would result in annoyance to some recreational users and residences. However, implementation of operational constraints identified in Section 2.5, as well as Proposed Resource-Specific Mitigations identified in the previous analysis, would minimize potential noise annoyance to less than significant and, in most cases, minimize noise to a negligible level. Noise levels would not be sufficiently intense to result in impacts other than annoyance or disturbance of recreational activities for those people not participating in the training. People involved in training would wear hearing protection if necessary, as required by DoD regulations. Activities such as munitions training and aircraft operations are either not regulated or are specifically exempted from local noise regulations. Ground vehicles and watercraft used during GLI training would be expected to generate noise levels below thresholds established in Florida Statutes.

Table 6-6 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

1

Table 6-6. Noise Impacts Summary – THSF

Proposed Action Effector	Training Location						
	Distributed Ops	LAPT FWALS	Nominal HLZ/DZ	Nominal OHO Location	Nominal Munitions Training Location	Nominal Ground Vehicle Training Location	Nominal Body of Water (Amphibious Training)
Land Disturbance	1	N/A	N/A	N/A	1	N/A	N/A
Ground Movement	N/A	N/A	N/A	N/A	N/A	1	N/A
Use of Expendables	N/A	N/A	N/A	N/A	2	N/A	N/A
Aircraft Operations	3	4	4	4	N/A	N/A	N/A
Amphibious Operations	N/A	N/A	N/A	N/A	N/A	N/A	1

DZ = drop zone; FWALS = Fixed-Wing Aircraft Landing Sites; HLZ = helicopter landing zone; LAPT = Light Aviation Proficiency Training; OHO = overwater hoist operations

1. Localized, short-term, and low-intensity noise

2. Localized, recurring events over long term. Munitions noise thresholds exceeded at known noise-sensitive locations (residences), and management actions are needed to reduce impacts to levels considered moderate.

3. Noise from aircraft maneuvering affects a wide area; recurring events; minimum altitude applied to reduce impacts to levels considered moderate.

4. Aircraft affects localized area; recurring events; noise thresholds are exceeded and measures must be applied during site selection and mission planning to reduce impacts to levels considered moderate.

2 **6.3.4 Proposed Resource-Specific Mitigations**

3 While noise impacts can be minimized, they cannot be completely avoided due to the
4 transient nature of training activities and recreational users, and the varying perception of
5 annoyance amongst members of the public. In addition to the mitigations identified in
6 Section [3.3.4](#), noise-generating expendables would not be used within 4,000 feet of noise-
7 sensitive locations at THSF. This measure would further minimize noise impacts.

8 [Figure 6-12](#) through [Figure 6-22](#) show the areas in which training activities would be
9 restricted based on buffer distances described above and in Section [3.3.4](#). Buffers would be
10 established for all privately owned parcels containing at least one residential structure and all
11 campgrounds.

12 **6.4 SAFETY**

13 **6.4.1 Affected Environment**

14 The affected environment for safety as it relates to proposed activities comprises the policies
15 and procedures currently in place at Eglin AFB, previously discussed in Sections [3.4.2](#) and

1 [3.4.3](#). The TFC of the FFS is primarily responsible for prevention, detection, and suppression
2 of wildfires wherever they may occur and to respond to other emergencies.

3 The TFC, which encompasses Leon, Gadsden, Liberty, Wakulla, Jefferson and Franklin
4 Counties, has reported approximately 87 annual average wildfires since January 2010 caused
5 by various sources, such as campfires, debris burning, lightning, and children ([Table 6-7](#)). Of
6 those, only about five on average were caused by equipment/vehicle use (FFS, 2013c).

7 **Table 6-7. Average Wildfires by Cause for THSF**

Cause	Fires Total	Fires Annual Average	Acres Total	Acreage Annual Average
Campfire	12	3	18.3	4.6
Children	13	3.2	44	11
Debris burn, authorized	60	15.1	517.7	129.4
Debris burn, nonauthorized	71	17.8	469.6	117.4
Equipment use (including vehicles)	20	5	67.2	16.7
Incendiary	16	4	361.4	90.4
Lightning	58	14.5	1,157.10	289.3
Miscellaneous	19	4.7	170.4	42.6
Power lines	15	3.8	9.4	2.4
Fireworks	1	0.2	0.2	0
Smoking	2	0.5	2.5	0.6
Unknown	60	15	943.5	235.9
Total	347	86.8	3,761.3	940.3

Source: FFS, 2013c

8 To respond to potential fires, TFC has eight forest rangers and four senior forest rangers that
9 are certified wildland firefighters in the THSF area. THSF also has two primary certified
10 wildland firefighter supervisors and an operations administrator. All certified personnel can
11 be utilized for suppressing wildfires on THSF.

12 THSF firefighting equipment includes four John Deere 650 bulldozers (Type 2) with plows and
13 four heavy bulldozers (Types 1 and 2) without plows for wildfire suppression and fire line
14 reinforcement. All bulldozers have an accompanying transport for moving the equipment. In
15 addition, the district has five Type 6 engines available for fire response. Specialized
16 equipment available for wildfire use includes a mechanic truck for field repairs, portable fuel
17 tanks, small water tenders, a backhoe, and various pickups and SUVs.

18 Three facilities are considered primary response locations in the THSF area. The THSF
19 headquarters is located in Carrabelle. The other two sites are tower/office sites. One is located
20 at St. James on the east side of the forest, and the other is East Bay Tower site, located on the
21 west side of the forest.

22 To mitigate wildfire risk, THSF has an aggressive prescribed burning program. Upland forest
23 lands are burned an average of every three to four years. This prevents high accumulations of
24 vegetative fuels that contribute to catastrophic wildfires. THSF prescribe burns roughly 35 to
25 45 thousand acres a year.

26 THSF cooperates with local county, state and Federal resources to suppress wildfires in the
27 local area. Cooperative agreements exist at the state and local level to allow paid and VFDs to

1 assist with wildfire suppression and structure protection. The following fire departments
2 commonly assist with wildfires on THSF: Alligator Point Fire Department, Apalachicola Fire
3 Department, Carrabelle Fire Department, Dog Island Fire Department, East Point Fire
4 Department, Lanark Village Fire Department, and the St. George Island Fire Department.
5 Other surrounding fire departments may assist as needed.

6 FFS also maintains cooperative wildfire assistance agreements with US Forest Service and
7 FWC. Each organization has a variety of conventional or specialized equipment and/or
8 personnel available for significant wildfire incidents on THSF.

9 FFS also has agreements with the Florida Highway Patrol and Florida Department of
10 Transportation to provide road closures and or signage necessary for smoke events on
11 Federal and State highways.

12 FFS monitors weather conditions daily for wildfire planning and burning authorization
13 purposes. It records rainfall at various locations, calculates the National Fire Danger Rating
14 System values daily, and sets fire preparedness levels. FFS also monitors and estimates the
15 KBDI and FDI for the State of Florida.

16 **6.4.2 Environmental Consequences**

17 As discussed in Section [3.4](#), potential adverse impacts may occur from wildfire associated with
18 UoEX. Other proposed action effectors are not addressed in this section.

19 Impacts to THSF associated with safety would be the same as those described in Section [3.4](#).
20 The Proposed Action would not negatively affect the ability to provide for safe operation of
21 aircraft or other equipment, nor would it result in uncontrollable safety hazards to military
22 personnel, the public, or property. Implementation of established procedures, as discussed in
23 Sections [3.4.2](#) and [3.4.3](#), would ensure that activities associated with the Proposed Action
24 would not result in significant impacts to safety.

25 At THSF, campfires are only allowed at designated camp sites, which would not be used by
26 training personnel; however, campfires could be used at the hardened camp sites in
27 designated fire pits. No campfires would be used in the interstitial areas of THSF. To minimize
28 the potential for fires caused by the UoEX and general training activities (such as idling
29 vehicles), before beginning missions, units would obtain the daily fire danger rating and
30 coordinate with FFS personnel to ensure that adequate fire response is available, if needed
31 per General Operational Constraints identified in Section [2.5](#). Under Florida law, it is unlawful
32 for any person to set fire to, or cause fire to be set to, any wildlands or to build a campfire or
33 bonfire or to burn trash or other debris within the designated area of a severe drought
34 emergency unless a written permit is obtained from the division or its designated agent.

35 **6.4.3 Safety Impact Summary**

36 [Table 3-15](#) describes the context, intensity, and duration factors utilized in analysis for
37 impacts to safety; based on these factors the Air Force has identified insignificant safety-
38 related impacts to public health and safety and the human and natural environment. The
39 potential for wildfire occurrence associated with training activities could result in adverse
40 impacts. However, requirements identified in Section [2.5](#) associated with wildfire prevention
41 and response would minimize the potential for this impact to occur.

1 [Table 6-8](#) summarizes the impacts identified. Impacts are categorized as follows:

- 2 • Adverse (yellow)
- 3 • Neutral/no effect (green)

4 **Table 6-8. Safety Impacts Summary – THSF**

Proposed Action Effector	Safety Receptor Type (Applies to All THSF TAs)	
	Military Personnel	General Public
Land Disturbance		
Land development	The Air Force has not identified any adverse safety impacts associated with these activities (see Section 3.4).	
Point impact		
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Dismounted maneuver	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Use of Expendables		
Blanks/GBS	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	Risk of wildfire is increased due to expendable use (GBSs at the hardened camp sites, smoke grenades, generators, etc.), which could affect the safety of the general public. However, GBS use would be restricted to hardened camp sites, thus reducing wildfire potential due to low fuel load associated with improved grounds, and the increase in potential wildfires caused by idling vehicles and other equipment would be negligible. While the risk of wildfire is unavoidable under the Proposed Action, General Operational Constraints, as well as fire management procedures implemented by both Eglin AFB personnel, and the FFS would serve to minimize this potential (see Section 6.4.2).
Smoke grenades		
Other/equipment		
Aircraft Operations	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Amphibious Operations	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	
Utilities	The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4).	

THSF = Tate's Hell State Forest; GBS = ground burst simulator; TA = tactical area

5 **6.4.4 Proposed Resource-Specific Mitigations**

6 All constraints and mitigations, mainly associated with wildfire prevention, are identified in
 7 Section [3.4.3](#). While these constraints and mitigations would minimize the potential for
 8 wildfires, the potential for increased wildfire occurrence cannot be completely avoided under
 9 the Proposed Action, and the potential for adverse safety impacts to THSF remains. The

1 increased potential for wildfire can only be avoided through implementation of the No Action
2 Alternative.

3 6.5 AIR QUALITY

4 6.5.1 Affected Environment

5 THSF is located in Franklin and Liberty Counties in Florida, which are in attainment for all
6 criteria pollutants (USEPA, 2013).

7 Baseline emissions for Franklin and Liberty Counties utilized in this document are presented
8 in [Table 6-9](#). These emissions data were acquired from the USEPA's 2008 NEI data for Franklin
9 County (USEPA, 2013). The county data include emissions data from point sources, area
10 sources, and mobile sources

11 **Table 6-9. Baseline Emissions Inventory for Franklin and Liberty Counties**

County	Pollutant (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Franklin	35,504	1,553	3,278	2,441	267	29,523	539,187
Liberty	39,332	1,464	4,344	3,365	358	40,466	658,347

Source: USEPA, 2013

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; SO₂ = sulfur dioxide; VOC = volatile organic compound

12 6.5.2 Environmental Consequences

13 As discussed in Section [3.5](#), potential adverse impacts to air quality may occur from land
14 development activities, use of wheeled vehicles and expendables, and aircraft and
15 Amphibious Operations. Other Proposed Action effectors are not addressed in this section.

16 Emissions from training activities were compared with those of Franklin and Liberty counties
17 to determine the impacts. While it is likely that air emissions would be distributed between
18 the two counties, it is unknown exactly how this distribution would occur, because it would
19 depend on the location of specific training events. As a result, air emissions analyses
20 compared the estimated Proposed Action emissions with each county's baseline emissions, as
21 well as those of the entire ROI (which would include both Franklin and Liberty Counties).

22 Emissions for land disturbance and fugitive dust for each training activity are provided in
23 Section [3.5](#). These emissions would cause negligible (less than 5 percent of emissions in each
24 county and the ROI) short-term impacts to regional air quality ([Table 6-10](#) and [Table 6-11](#)).

1

Table 6-10. Air Emissions From Land Clearing Compared with the ROI

Source	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO ₂ e
Land Disturbance	<0.01	<0.01	28.6	<0.01	<0.01	<0.01	<0.01
% of County Baseline Emissions							
Franklin County	<0.01	<0.01	0.87	<0.01	<0.01	<0.01	<0.01
Liberty County	<0.01	<0.01	0.66	<0.01	<0.01	<0.01	<0.01
Total ROI baseline emissions	74,836	3,017	7,622	5,806	625	69,989	1,197,534
% Emissions of ROI	0.00%	0.00%	0.38%	0.00%	0.00%	0.00%	0.00%

CO = carbon monoxide; CO₂e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

2

Table 6-11. Fugitive Dust Emissions Compared with the ROI

Fugitive Dust Emissions	PM (tons/event)	PM (tons/year)
Total	6.66	46.11
% of County Baseline Emissions		
Franklin County		1.4
Liberty County		1.061
Total ROI baseline emissions		3,2787,622
% Emissions of ROI		1.410.60%

PM = particulate matter; ROI = region of influence

3 Wheeled vehicle emissions associated with each training activity are provided in Section [3.5](#).
 4 Vehicles operating in the ROI would emit negligible short-term levels of air pollutants
 5 ([Table 6-12](#)). GHG and air pollutant emissions would not exceed thresholds for significant
 6 negative impacts.

7

Table 6-12. Wheeled Vehicle Air Emissions Compared with the ROI

Wheeled Vehicle Emissions	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO ₂ e
Total/Year	32.03	6.26	1.32	1.42	0.48	31.51	748.18
% of County Baseline Emissions							
Franklin County	0.09	0.40	0.04	0.06	0.18	0.11	0.14
Liberty County	0.08	0.43	0.03	0.04	0.13	0.08	0.11
Total ROI baseline emissions	74,836	3,017	7,622	5,806	625	69,989	1,197,534
% Emissions of ROI	0.04%	0.21%	0.02%	0.02%	0.08%	0.05%	0.06%

CO = carbon monoxide; CO₂e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

1 Emissions from training munitions are provided in Section 3.5. [Table 6-13](#) summarizes
 2 emissions from training munitions. The emissions calculated are for all proposed munitions
 3 and would result in a negligible impact on air quality.

4 **Table 6-13. Training Munitions Emissions Compared with the ROI**

Munitions Emissions	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Maximum emissions/year	0.18	0.02	0.75	0.21	0.00	0.00	0.35
% of County Baseline Emissions							
Franklin County	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Liberty County	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total ROI baseline emissions	74,836	3,017	7,622	5,806	625	69,989	1,197,534
% Emissions of ROI	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

5 Aircraft emissions were provided previously in Section 3.5. [Table 6-14](#) summarizes emissions
 6 from aircraft operations for the different types of activities. Aircraft operations would cause
 7 short- to medium-term impacts to air emissions in Franklin County. In particular, NO_x and SO₂
 8 would cause an 8.97 and 3.94 percent increase in air pollutant emissions in Franklin County,
 9 and 9.51 and 2.94 percent increase, respectively, in Liberty County ([Table 6-14](#)). However, this
 10 analysis assumed all activities would occur within a single county. It is more likely that air
 11 emissions would be comparable to those of the entire ROI, because air operations would be
 12 distributed between the two counties. Consequently, aircraft emissions would likely result in
 13 an approximate 4.62 percent increase in NO_x and a 1.68 percent increase in SO₂ air emissions
 14 over the two-county area. Aircraft emissions evaluated based on context, intensity, and
 15 duration (see [Table 3-18](#)) would not be greater than 10 percent and would not affect either
 16 county's attainment status.

17 **Table 6-14. Aircraft Emissions Compared with the ROI**

Aircraft Emissions	Emissions (tons/year)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Total/Year	62.96	139.28	38.36	33.03	10.51	11.84	13,488
% of County Baseline Emissions							
Franklin County	0.18	8.97	1.17	1.35	3.94	0.04	2.50
Liberty County	0.16	9.51	0.88	0.98	2.94	0.03	2.05
Total ROI Baseline Emissions	74,836	3,017	5,806	7,622	625	69,989	1,197,534
% Emissions of ROI	0.08%	4.62%	0.66%	0.43%	1.68%	0.02%	1.13%

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

18 Amphibious Operations require the use of watercraft. Emissions from such sources would
 19 have negligible short-term impacts to regional air quality ([Table 6-15](#)).

Table 6-15. Amphibious Operations Emissions Compared with the ROI

Source	Emissions (tons)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Amphibious Operations/event	0.00	0.00	0.00	0.00	0.05	0.44	0.00
Amphibious Operations/year	0.01	0.01	0.00	0.01	0.48	4.42	0.00
% of County Baseline Emissions							
Franklin County	<0.01	<0.01	<0.01	<0.01	0.18	<0.01	<0.01
Liberty County	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	<0.01
Total ROI Baseline Emissions	74,836	3,017	7,622	5,806	625	69,989	1,197,534
% Emissions of ROI	0.00%	0.00%	0.00%	0.00%	0.08%	0.01%	0.00%

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

6.5.3 Air Quality Impact Summary

Table 3-18 describes the context, intensity, and duration factors utilized in analysis for impacts to air quality; based on these factors the Air Force has identified insignificant adverse impacts to air quality. In summary, training activities would result in small amounts of air emissions when compared with the baseline. However, these emissions are still within emission standard guidelines and would not adversely impact public health or safety or the human and natural environment.

Table 6-16 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

Table 6-16. Air Quality and Greenhouse Gas Emission Impact Summary – THSF

Proposed Action Effector	Air Quality/Greenhouse Gases (% ROI Emissions)						
	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOCs	CO _{2e}
Land Disturbance	0.00%	0.00%	0.38%	0.00%	0.00%	0.00%	0.00%
Ground Movement	0.04%	0.21%	0.02%	0.02%	0.08%	0.05%	0.06%
Use of Expendables	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Aircraft Operations	0.08%	4.62%	0.66%	0.43%	1.68%	0.02%	1.13%
Amphibious Operations	0.00%	0.00%	0.00%	0.00%	0.08%	0.01%	0.00%
Total % of ROI emissions	0.12%	4.83%	1.07%	0.45%	1.84%	0.08%	1.19%

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter of 10 microns or less; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO₂ = sulfur dioxide; VOC = volatile organic compound

6.5.4 Proposed Resource-Specific Mitigations

No Resource-Specific Mitigations for air quality have been identified.

6.6 EARTH RESOURCES

6.6.1 Affected Environment

This section discusses the geologic and soil resources that compose THSF. Discussion focuses on impact assessment resource features and issues identified in Section [3.6](#), *Earth Resources*.

6.6.1.1 Geologic Resources

The following subsections discuss the land-surface form, sensitive karst terrain, and closed depression geologic features of THSF.

Land-Surface Form

The THSF land-surface form is a component of the Terraced Coastal Lowland, Apalachicola delta complex and primarily consists of low marine terraces created by ocean currents and wave actions when sea levels were higher (USDA, 1994). The forest lies between the Ochlocknee and Apalachicola Rivers on the deep sedimentary materials of the Apalachicola Embayment. Much of the Pleistocene epoch sediments are composed of extensive clay layers and graded quartz sand not found elsewhere in northwest Florida (Kindell, 1997). Land elevations generally range from sea level along the coast to 42 feet above mean sea level on the relict quartz sand dune ridges of the Talbot marine terraces. Slopes are moderate near the coast and level to nearly level in most other areas of the forest.

The low, swampy conditions that characterize much of THSF are a product of the delta formed by the Apalachicola River as it enters Apalachicola Bay and the slowly permeable clay layers that underlie much of the forest (USDA, 1994). The THSF contains shallow-gradient terraces, low ridges, flats, depressions, swamps, and marshes that often exhibit fluctuating near-surface water tables and/or frequent to occasional flooding (Photo: Tate's Hell State Forest Typical Land-Surface Form). As a consequence of low elevations and minor relief, runoff is slow and drainage is generally characterized by numerous sluggish tributary drains that are often bounded by wet plains, swamps, and marshes (Mooney and Patrick, 1916). There are no identified commercially mined mineral resources within THSF (USDA, 1994).



THSF Typical Land-Surface Form (Photo by Greg Kesler)

1 **Sensitive Karst Terrain**

2 The areas of sensitive karst terrain occurring on
 3 THSF are listed in [Table 6-17](#) and shown in
 4 [Figure 6-24](#). Karst areas were identified as
 5 occurring in all tactical areas except Whiskey
 6 George (TA-4) and Deep Creek (TA-8).
 7 Approximately 47 percent of sensitive karst
 8 terrain occurs within Juniper Creek (TA-2) and
 9 New River (TA-5).

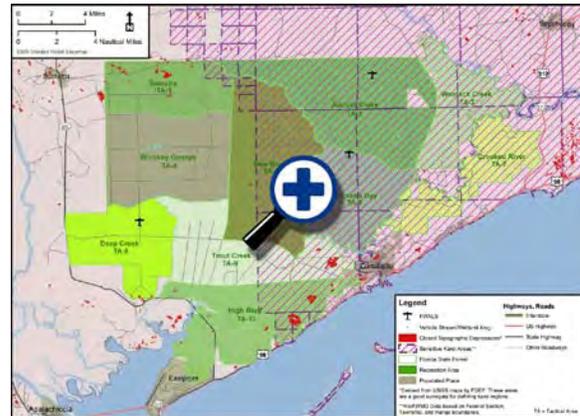


Figure 6-24. THSF Sensitive Karst Areas, Closed Depressions, and Gulf Coastline

10

Table 6-17. THSF Sensitive Karst Areas

Tactical Area (TA)	Acres
Sumatra (TA-1)	951
Juniper Creek (TA-2)	31,335
Womack Creek (TA-3)	14,012
Whiskey George (TA-4)	0
New River (TA-5)	20,712
Pickett's Bay (TA-6)	16,865
Crooked River (TA-7)	13,223
Deep Creek (TA-8)	0
Trout Creek (TA-9)	7,126
High Bluff (TA-10)	7,499
Total	111,723

11 **Closed Depressions**

12 Geologic features that influence the form and functions of land-surface forms within some
 13 High Bluff (TA-10) coastal areas are the closed depressions. Two types of closed depressions
 14 that occur within the THSF coastal region include muck and sand depressions (USDA, 1916).
 15 Closed depression subsidence incidents for THSF are summarized in [Table 6-18](#) and shown in
 16 [Figure 6-24](#). No THSF closed depressions have been classified as karst sinkholes. About
 17 70 percent of THSF closed depressions are within Sumatra (TA-1) and High Bluff (TA-10) TAs.

18

Table 6-18. THSF Closed Depression Subsidence Areas

Tactical Area (TA)	Closed Depression Subsidence Areas	
	Number	Acres
Sumatra (TA-1)	30	149
Juniper Creek (TA-2)	0	0
Womack Creek (TA-3)	1	5
Whiskey George (TA-4)	0	0
New River (TA-5)	9	55
Pickett's Bay (TA-6)	0	0
Crooked River (TA-7)	0	0
Deep Creek (TA-8)	5	15
Trout Creek (TA-9)	5	158
High Bluff (TA-10)	17	273
Total	67	655

1 **6.6.1.2 Soil Resources**

2 **Soils Inventory**

3 The 6 soil orders, 9 soil suborders, and 55 soil series that compose THSF are summarized in
 4 [Table 6-19](#) and shown in [Figure 6-25](#). Many THSF landforms exhibit wet soils conditions and
 5 are defined as hydric soils (see Section [5.6.1.2](#)). Approximately 55 percent of the THSF soil
 6 series is classified as hydric and about 98 percent of the forest land area is designated as
 7 hydric; for all TAs, the percent hydric soils was 90 percent and greater. The highest
 8 concentration of nonhydric areas is the Psammets soil suborder along the marine terrace
 9 coastline in High Bluff (TA-10) ([Table 6-20](#) and [Figure 6-26](#)). More detail by tactical area is
 10 provided in Appendix E, *Earth Resources*.

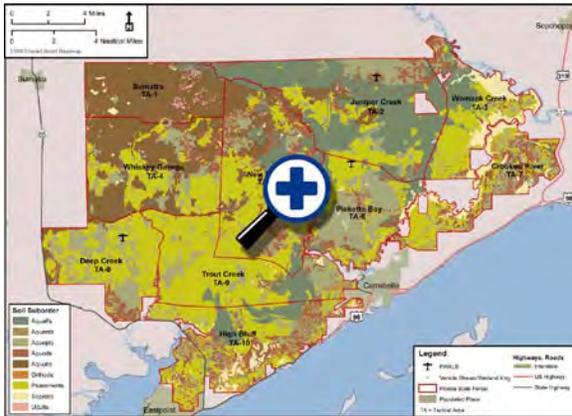


Figure 6-25. THSF Soil Suborders

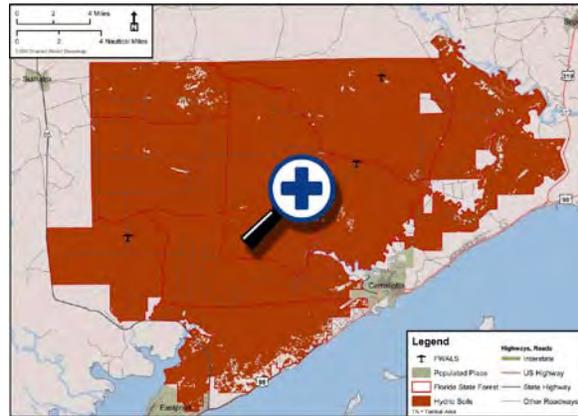


Figure 6-26. THSF Hydric Soils

11

Table 6-19. THSF Soils Summary

Soil Taxonomy Class	Total (Acres)
1 Alfisols Soil Order	
1A Aqualfs Soil Suborder	1
2 Entisols Soil Order	2
2A Aquents Soil Suborder	2
2B Psammets Soil Suborder	2
3 Histosols Soil Order	
3A Sapristis Soil Suborder	3
4 Inceptisols Soil Order	
4A Aquepts Soil Suborder	4
5 Spodosols Soil Order	5
5A Aquods Soil Suborder	5
5B Orthods Soil Suborder	5
5 Ultisols Soil Order	5
5A Aquults Soil Suborder	5
5B Udufts Soil Suborder	5

1

Table 6-20. THSF Hydric Soils

Tactical Area (TA)	Hydric Soils (acres)	Percent of TA Total
Sumatra (TA-1)	14,242	96
Juniper Creek (TA-2)	31,116	99
Womack Creek (TA-3)	13,418	96
Whiskey George (TA-4)	24,693	100
New River (TA-5)	29,045	100
Pickett's Bay (TA-6)	16,716	99
Crooked River (TA-7)	12,851	96
Deep Creek (TA-8)	16,520	100
Trout Creek (TA-9)	20,867	99
High Bluff (TA-10)	20,539	90
Total	200,007	—

2 Prime Farmland Soils

3 THSF prime farmland soils include Goldsboro loamy sand found within the Sumatra TA (TA-1),
4 composing less than 0.5 percent (66 acres) of the total forest area ([Table 6-21](#)).

5 **Table 6-21. Tate's Hell State Forest Prime Farmland Soils (Sumatra TA-1)**

Soil Series Name	Acres ¹	Percent of Forest
Goldsboro loamy sand, 0 to 2 percent slopes	51	0.34
Goldsboro loamy sand, 2 to 5 percent slopes	15	0.09
Total	66	0.43

TA = tactical area

1. Total area does not include borrow pits, water, urban lands, Aquents, gullied lands, and other variants.

6 Soil Erosion

7 Because of the relatively flat terrain (see Section [6.6.1.1](#)), THSF is considered to have a
8 generally low susceptibility to soil erosion. Other than natural coastal erosion and
9 accelerated erosion of some unpaved roads and crossings, THSF has no known major soil
10 erosion problems (FDACS, 2007).

11 **Erodible Soils**

12 There are no known highly erodible or potentially highly erodible soils at THSF.

13 **Natural Soil Erosion Sources**

14 [Steepheads](#)

15 There are no known steepheads at THSF.

16 [Streambanks](#)

17 No evidence of overheightened and overstepped THSF streambanks was identified. It is
18 estimated that these conditions are less likely to occur within the forest because of the
19 relatively flat terrain and subsequently lower stream gradients.

1 [Gulf Coastline Erosion](#)

2 Beach erosion (shoreline retreat) and sediment
3 accretion (shoreline advance) are ongoing
4 natural processes along the approximately
5 4,820 feet of the High Bluff tactical area (TA-10)
6 that borders the Gulf of Mexico coastline ([Figure
7 6-24](#)).

8 ***Accelerated Soil Erosion Sources***

9 [Borrow Pits](#)

10 There are no known active borrow pits located at
11 THSF.

12 [Unpaved Roads and Crossings](#)

13 The THSF unpaved road network primarily consists of maintained primary, secondary, and
14 tertiary roads; about 55 percent of unpaved roads are classified as dirt tertiary ([Figure 6-27](#))
15 and [Table 6-22](#)). THSF *dirt roads* are primarily surfaces with imported clayey materials. *Rock*
16 *roads* are of crushed limestone or gravel (Photo: THSF Crushed Limestone Tertiary Road), and
17 *sand roads* are surfaced with native soils (Photo: THSF Sand Tertiary Road).

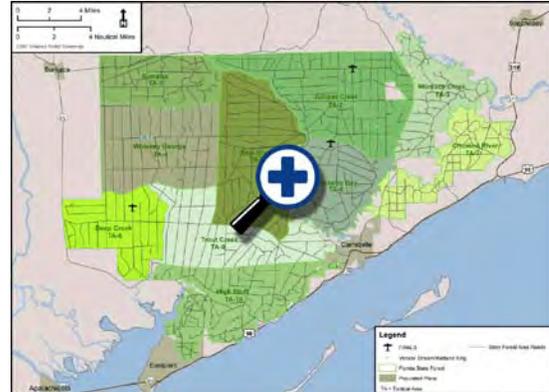


Figure 6-27. THSF Unpaved Roads and Crossings

18

Table 6-22. THSF Unpaved Roads Summary

Unpaved Road Class	Road Surface Type	Road Width (feet)	Road Length (miles)
Primary	Dirt	12–18	103
		24–25	5
	Rock	10–18	20
Secondary	Dirt	5–10	8
		12–15	121
		18	33
	Sand	12	1
Tertiary	Dirt	5–10	158
		11–15	288
		16–28	51
		30	3
	Rock	5	1
		10	1
	Sand	10	1
12		2	
Activity	Dirt	5–10	3
		12–15	3
Service	Dirt	5–10	1
		12–15	2
		24	1
Total			806

1 There are approximately seven unpaved road crossings on THSF (Table 6-23) that occur in
 2 TA-1 through TA-4. Potential crossings include bridges, culverts, and low water crossings. A
 3 discussion of the environmental effects of unpaved roads and crossings is provided in Section
 4 5.6.1.2, *Soil Erosion*. THSF has developed a road plan (FDACS, Division of Forestry, 2007)
 5 outlining road removal, road bridge and low water crossing upgrades and maintenance
 6 activities, and updates to the forest road network database to promote a comprehensive road
 7 network maintenance program. Planned unpaved road and crossing activities to restore
 8 hydrology will include installation of culverts, low water crossings, and roadside ditch plugs
 9 and/or reshaping of road surfaces. Additional information can be found at
 10 http://www.floridaforestservice.com/state_forests/sf_management_plans/THSF/THSF%20FIN
 11 [AL%202007%20PLAN.pdf](http://www.floridaforestservice.com/state_forests/sf_management_plans/THSF/THSF%20FIN).

12 **Table 6-23. THSF Unpaved Road Crossings**

Tactical Area (TA)	Number of Crossings ¹
Sumatra (TA-1)	2
Juniper Creek (TA-2)	1
Womack Creek (TA-3)	1
Whiskey George (TA-4)	3
New River (TA-5)	0
Picketts Bay (TA-6)	
Crooked River (TA-7)	
Deep Creek (TA-8)	
Trout Creek (TA-9)	
High Bluff (TA-10)	
Total	7

1. Includes culvert, bridge, and low water crossings

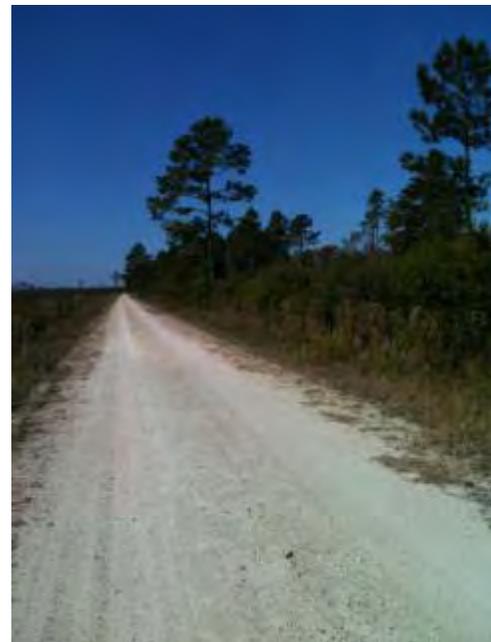


THSF Sand Tertiary Road (Photo by Greg Kesler)

13 Road operational maintenance equipment includes road graders, dump trucks, and farm
 14 tractors with implements, choppers, and a backhoe. Road shoulders are maintained by tandem
 15 roller drum chopping, followed by harrowing and
 16 finish grading. The long-term goal is to maintain
 17 road shoulder on primary and secondary unpaved
 18 roads using tractor mowers (FDACS, 2007). Unpaved
 19 roads maintenance is conducted in compliance with
 20 the forest road standards described in the Road and
 21 Bridge Plan (FDACS Division of Forestry [DOF] Policies
 22 and Procedures 500.108) and silviculture BMPs
 23 manual (FDACS, 2008) developed by FDACS,
 24 Department of Forestry for each state forest (FDACS,
 25 2007).

26 **6.6.2 Environmental Consequences**

27 As discussed in Section 3.6.3, potential adverse
 28 impacts to earth resources may occur from land
 29 development activities, use of wheeled vehicles and
 30 dismantled movement, and aircraft and AO. Other
 31 proposed action effectors are not addressed in this
 32 section.



THSF Crushed Limestone Tertiary Road
 (Photo by Greg Kesler)

6.6.2.1 Land Disturbance

As discussed in Section 3.6.3, use of HLZs/DZs, point impacts, consumption, and incidental land disturbance would have no adverse impact on soils. Impacts to THSF earth resources identified in Section 6.6.1 would generally be the same as those described in Section 3.6.

Fixed-Wing Aircraft Landing Sites

The three proposed FWALS would utilize existing unpaved roads in Juniper Creek (TA-2), Picketts Bay (TA-6), and Deep Creek (TA-8) (see Section 2.3.2.2 and Figure 2-11 through Figure 2-13). The FWALS requirements and analysis impact scenarios for THSF would be the same as those presented for BRSF FWALS landings in Section 3.6.3.

Of particular importance to this analysis is the dominance of nearly level terrain, hydric soils, and wetland ecosystems (see Sections 6.6.1.1 and 6.6.1.2), and the potential for sensitive karst terrain (Section 6.6.1.1). As shown in Table 6-24, the majority of soils at all proposed FWALS locations are hydric.

Table 6-24. THSF Proposed FWALS Soils

Tactical Area (TA)	Soils	Soil Type	Footprint Area (acres/percent)
TA-2 FWALS	Sapelo sand, 0 to 2 percent slope	Nonhydric	7.7/29
	Torhunta-Lynn Haven-Croatan complex, frequently flooded	Hydric	0.6/2
	Meadowbrook sand, slough	Hydric	0.5/2
TA-6 FWALS	Scranton fine sand, 0 to 2 percent slope	Nonhydric	3.3/12
	Scranton fine sand, slough	Hydric	3.6/13
	Dorovan-Pamlico complex, depressional	Hydric	2.1/8
TA-8 FWALS	Scranton sand, slough	Hydric	3.5/13
	Rutledge fine sand, 0 to 2 percent slope	Hydric	5.4/20

THSF level to near-level slopes generally minimize the potential for soils to erode and transport sediments. However, the extent and distribution of wetlands throughout the forest increases the potentials for on-site erosion and sedimentation to intersect and be transported by waterways and impact off-site aquatic ecosystem habitats and water quality. Utilization of erosion control BMPs during roadway improvements for fixed-wing aircraft landings, as outlined in Sections 3.7 and 3.8, would serve to minimize potential sedimentation issues.

Hydric soils are characterized by extended periods of surface and/or near-surface saturation by flooding and/or water table fluctuations. These wet conditions are when soils are most prone to physical damage from mechanical compaction and rutting. Soil physical damage would most likely occur during FWALS improvements and clear zone maintenance activities. Extensive soil damage is not prone to remediation by natural means and normally requires mechanical intervention. The potential inclusion of roadside hydric soils areas for the TA-2, TA-6, and TA-8 FWALS landing zones would result in dredge and fill operations that may require federal and state permits (see Section 3.7). However, as noted under LU-1 conditions, fixed-wing aircraft landings in these areas may only occur on roadways that do not require extensive improvements. Additionally, zone maintenance would not be conducted by the Air Force, but would occur as part of normal forest management processes.

There is also the potential for proposed FWALS within TA-2 and TA-6 to affect subsurface karst features. The possible excavation of existing unpaved road materials to establish the required

1 landing zone subgrade and surface course could damage or disrupt underlying karst features.
 2 Impacts to karst geology could compromise the loading capacity and stability of affected
 3 landing zones.

4 With the implementation of Proposed Resource-Specific Mitigations (see Section 3.6.4),
 5 potential earth resource impacts associated with THSF FWALS construction and landings at
 6 the proposed TA-2, TA-6, and TA-8 are anticipated to be adverse but insignificant, site-
 7 specific, of low intensity, and short-term duration. No loss or degradation of prime farmland
 8 or closed depression features is anticipated.

9 [Table 6-25](#) summarizes soil suitability ratings for landing zones of proposed FWALS at THSF.

10

Table 6-25. THSF Unpaved Road FWALS Suitability

Tactical Area (TA)	Soils	Soil Type	Suitability Rating
TA-2 FWALS	Sapelo sand, 0 to 2 percent slope	Nonhydic	Poorly Suited
	Torhunta-Lynn Haven-Croatan complex, frequently flooded	Hydic	
	Meadowbrook sand, slough	Hydic	
TA-6 FWALS	Scranton fine sand, 0 to 2 percent slope	Nonhydic	Moderately Suited
	Scranton fine sand, slough	Hydic	Poorly Suited
	Dorovan-Pamlico complex, depressional	Hydic	
TA-8 FWALS	Scranton sand, slough	Hydic	
	Rutledge fine sand, 0 to 2 percent slope	Hydic	

11 6.6.2.2 Ground Movement

12 As discussed in Section 3.6, ground movement has the potential for causing soil erosion;
 13 however, this potential is considered negligible given general operating procedures
 14 identified in Section 2.5 and the Proposed Resource-Specific Mitigations identified in
 15 Section 3.6.4. Based on information provided in Section 3.6, THSF temporary low- and
 16 moderate-use camp site suitability and limitation constraint areas are summarized in
 17 [Table 6-26](#) and [Figure 6-28](#). THSF tactical area lands were rated as somewhat limited or very
 18 limited for bivouac suitability. Limitations would be less restrictive on sites for tents or
 19 remote camps. Areas identified as very limited would not be suitable for bivouacking.
 20 Bivouac constraint areas are summarized in [Table 6-26](#) and depicted in [Figure 6-28](#).

21

Table 6-26. THSF Bivouac Constraint Areas¹

Tactical Area (TA)	Constraint Area (acres)		Total Area (acres)
	Somewhat Limited	Very Limited	
Sumatra (TA-1)	75	14,741	14,816
Juniper Creek (TA-2)	0	31,253	31,253
Womack Creek (TA-3)	0	13,908	13,908
Whiskey George (TA-4)	0	24,785	24,785
New River (TA-5)	0	29,141	29,141
Picketts Bay (TA-6)	0	16,745	16,745
Crooked River (TA-7)	0	13,298	13,298
Deep Creek (TA-8)	0	16,529	16,529
Trout Creek (TA-9)	0	21,029	21,029
High Bluff (TA-10)	0	22,774	22,774
Total	75	204,203	204,278

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

1 Constraint areas where mission impact-induced
 2 earth resource effects are most likely to occur
 3 include closed depressions, steepheads, and
 4 hydric and erodible soils. Steepheads and
 5 closed depressions represent locations where
 6 steep slopes and sustained wet soil conditions
 7 are sensitive to soil disturbances from troop
 8 movements. These would mostly likely occur
 9 during dismounted maneuvers.

10 As discussed in Section 3.6, no adverse impacts
 11 to off-road areas would occur from wheeled
 12 vehicles. Proposed use of unpaved roads and
 13 crossings could degrade and destabilize
 14 unpaved road soil or aggregate surfaces, which
 15 could increase soil erosion and sedimentation. However, the proposed mission frequency as
 16 identified in Chapter 2 would likely not exceed the carrying capacity of available unpaved
 17 roads or be greater than the current level of vehicle use. Vehicles traversing low-water
 18 crossings could destabilize road approach slopes and increase soil erosion. Generally, the
 19 potential sources of sediment are limited to the portions of the road in immediate contact
 20 with the water course and the distance of road slopes from the gradient crest to the stream.
 21 Driving through a stream also mobilizes streambed sediments.

22 However, implementation of General Operational Constraints identified in Section 2.5, along
 23 with implementation of Proposed Resource-Specific Mitigations in Section 3.6.4, would serve
 24 to minimize impacts to earth resources.

25 6.6.2.3 Aircraft Operations

26 The proposed THSF aircraft operations detailed below include FWALS landings, HLZ/DZ
 27 landings, and FARP/HGO. FWALS landings and HLZ/DZ landings may occur within LU-1 and
 28 LU-2 areas, while FARP/HGO may only occur in LU-2 areas on asphalt or concrete. All activities
 29 must adhere to noted general and Proposed Resource-Specific Constraints and mitigations
 30 identified in Sections 2.5 and 3.6.4, respectively. FARP/HGO and other fueling activities were
 31 previously discussed in Section 3.6, and no adverse impacts were identified.

32 Prominent earth resources at THSF that exhibit characteristics potentially sensitive to HLZ/DZ
 33 landings include sensitive karst areas, closed depressions, and hydric soils. Hydric soils
 34 compose 98 percent of THSF, and sensitive karst areas make up 55 percent. Because of the
 35 low, relatively flat terrain and extent of hydric soils and sensitive karst areas, most areas of
 36 THSF could be affected by landing/takeoff activities. Rutting damage to wet soils would likely
 37 be greatest in Ultisol and Inceptisol soils, which tend to have higher amounts of silt and/or
 38 clay in the topsoil, as well as Histosols, which have high amounts of organic matter. The
 39 depth of soil damage during landings could exceed 10 inches.

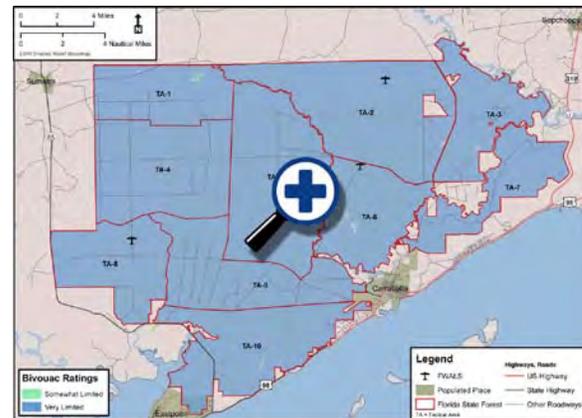


Figure 6-28. THSF Bivouac Constraint Areas

1 In karst areas, near-surface limestone solution pipes or caverns could be breached or
 2 otherwise damaged by landing wheels. Since surface indicators of susceptible solution pipes
 3 or caverns are usually absent, it is assumed these formations could be present within all
 4 affected TAs where karst occurs. Closed depressions are often early indicators of karst
 5 sinkhole formation. As with wet hydric soils, the contact point footprints would affect a small
 6 area and the infrequent occurrences and distribution of aircraft landing events at various
 7 THSF locations would minimize repetitive
 8 impacts.

9 Based on analyses presented in Section 3.6, THSF
 10 HLZ suitability and limitation constraint areas are
 11 summarized in Table 6-27 and Figure 6-29. Very
 12 limited areas fall under the LU-1 category and
 13 would be limited in use for HLZs/DZs.

14 Again, with the implementation of mitigations
 15 specific to earth resources (see Section 3.6.4),
 16 potential soil erosion, compaction, and rutting
 17 impacts from proposed FWALS landings and
 18 HLZ/DZ use at THSF are anticipated to be adverse
 19 but insignificant, site-specific, low intensity, and
 20 short term because HLZs and FWALS would be rotated over time. No loss or degradation of
 21 prime farmland, karst soils, geologic steephead, or closed depression features is anticipated.
 22 Since no disturbance of wetlands is proposed within the estimated footprint area, federal or
 23 state wetland permits are not required.



Figure 6-29. THSF Helicopter Landing Zone Constraint Areas

Table 6-27. Helicopter Landing Zone Constraint Areas¹

Tactical Area (TA)	Constraint Area (acres)		Total Area (acres)
	Not Limited	Somewhat Limited	
Sumatra (TA-1)	7,675	7,141	14,816
Juniper Creek (TA-2)	15,379	15,874	31,253
Womack Creek (TA-3)	6,999	6,909	13,908
Whiskey George (TA-4)	17,595	7,190	24,785
New River (TA-5)	17,489	11,652	29,141
Picketts Bay (TA-6)	6,658	10,087	16,745
Crooked River (TA-7)	8,541	4,757	13,298
Deep Creek (TA-8)	12,032	4,497	16,529
Trout Creek (TA-9)	11,454	9,575	21,029
High Bluff (TA-10)	15,626	7,148	22,774
Total	119,448	84,830	204,278

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

25 **6.6.2.4 Amphibious Operations**

26 Boat and troop egress and ingress activities would occur along the banks and shorelines of
 27 available training areas within all use areas (except prohibited areas and RAs), with noted

1 General Operational Constraints and Proposed Resource-Specific Mitigations identified in
 2 Sections 2.5 and 3.6.4, respectively. As discussed in Section 3.6, AO could disturb soils and
 3 trample vegetation, resulting in conditions that may result in accelerated bank erosion.

4 AO could destabilize streambanks and significantly increase soil loss and streambank retreat.
 5 On streambanks and shorelines with established vegetation and stable grades (not
 6 overheightened or oversteepened), impacts would consist of minor disturbances that, in
 7 most cases, would naturally recover. Operations conducted at boat launches would not likely
 8 increase streambank degradation or soil loss.

9 Implementation of General Operational Constraints and Proposed Resource-Specific
 10 Mitigations, such as rotation of ingress/egress locations, would serve to minimize impacts to
 11 earth.

12 **6.6.3 Earth Resources Impact Summary**

13 [Table 3-27](#) describes the context, intensity, and duration factors utilized for impacts to earth
 14 resources; based on these factors the Air Force has not identified insignificant adverse
 15 impacts to the natural environment. In summary, there are unavoidable adverse impacts
 16 associated with minor soil erosion resulting from roadway improvements for fixed-wing
 17 aircraft landings, HLZ/DZ use, ground movement, and AO. No NPDES permitting
 18 requirements have been identified. The intensity of these impacts is minimized through
 19 implementation of General Operational Constraints and Proposed Resource-Specific
 20 Mitigations identified in Sections 2.5 and 3.6.4, respectively.

21 [Table 6-28](#) provides a summary of the impacts identified. Impacts are categorized as follows:

- 22 • Adverse (yellow)
- 23 • Neutral/no effect (green)

24 **Table 6-28. Earth Resource Impacts Summary by TA – THSF**

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).	Potential soil erosion impacts associated with roadside bushhogging and road grading for roadway improvement for FWALS.	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).			Potential soil erosion impacts associated with roadside bushhogging and road grading for roadway improvement for FWALS.			Potential soil erosion impacts associated with roadside bushhogging and road grading for roadway improvement for FWALS.	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).
Point impact	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).									
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	Potential for soil compaction, rutting, and accelerated soil erosion associated with ISD on roadways. Vehicle use at water crossings could increase soil erosion and mobilization of streambed sediments. Additionally, soil/water									

Table 6-28. Earth Resource Impacts Summary by TA – THSF, Cont'd

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
	contamination could result from fuels and other materials on roadways and in parking areas. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact.									
Dismounted movement	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).									
Use of Expendables										
Blanks/GBS	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).									
Smoke grenades										
Other/equipment										
Aircraft Operations	Potential for soil compaction, rutting, accelerated soil erosion, and soil/water contamination from landing/takeoff activities and refueling activities. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact.									
Amphibious Operations	Operations could further destabilize streambanks in some reaches of THSF streams with existing overheightened and oversteepened bank conditions, resulting in increased soil loss and streambank retreat. In streams with established vegetation and stable banks, minor disturbances would be expected to naturally recover. Operations at boat launches should not have any adverse effects. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact.									
Utilities	The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6).									

BMP = best management practice; FWALS = Fixed-Wing Aircraft Landing Sites; GBS = ground burst simulator; ISD = incidental surface disturbance

1 **6.6.4 Proposed Resource-Specific Mitigations**

2 No additional Resource-Specific Mitigations for earth resources have been identified as a
 3 result of analyses in this chapter. All General Operational Constraints (Section 2.5) and
 4 Proposed Resource-Specific Mitigations (Section 3.6.4) identified previously would sufficiently
 5 minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect
 6 (green).

7 **6.7 WATER RESOURCES**

8 **6.7.1 Affected Environment**

9 Water resources at THSF include the watersheds of Ochlockonee River, New River and
 10 Whiskey George Creek, the Floridan aquifer, and extensive areas of wetlands and floodplains
 11 throughout the area.

12 **6.7.1.1 Surface Waters**

13 THSF includes portions of three major watersheds: the Ochlockonee River, New River, and
 14 Whiskey George Creek (part of the Apalachicola River basin) (FDEP, 2001; FDEP, 2002). The
 15 eastern portion of THSF is part of the Ochlockonee River watershed; Crooked Creek is a major
 16 tributary of this watershed. The New River basin is the largest watershed in THSF. The
 17 tributaries that feed the New River include Juniper Creek (northeast of the New River), Gator
 18 Creek, Gully Branch, Trout Creek, Nero Branch, and an unnamed creek. The New River merges

1 with the Crooked River to form the Carrabelle River and discharges into St. George Sound.
 2 Southwest of the Carrabelle River, runoff from some coastal areas of THSF discharges directly
 3 into St. George Sound. Whiskey George Creek is located west of New River, east of the
 4 Apalachicola River. Tributaries to Whiskey George Creek include Juniper Creek and Doyle
 5 Creek. Whiskey George Creek drains into the West Bayou of East Bay, which is part of
 6 Apalachicola Bay. FDEP classifies portions of the Ochlockonee River as an OWF. Several
 7 streams in THSF are listed as impaired by FDEP. [Table 6-29](#) lists impaired waters in the THSF
 8 and the impairment classification for each.

9 Since 1994, NFWFMD and FFS began acquiring the THSF property with the goal of restoring
 10 historical ecological communities and surface water drainage patterns to improve the quality
 11 of surface water discharged to the Apalachicola Bay system and surrounding waters
 12 (NFWFMD–FFS, 2010a; NFWFMD–FFS, 2010b). NFWFMD and FFS share responsibility for
 13 restoring and protecting THSF's hydrology and ecosystems. The overall goals of hydrologic
 14 restoration at THSF are to:

- 15 • Improve the water quality of surface water flows and runoff discharged to East Bay,
 16 Apalachicola Bay, and surrounding waters.
- 17 • Restore historical surface water drainage patterns.
- 18 • Enhance wetland hydrology and function.
- 19 • Restore a mix of native ecological communities.

20 **Table 6-29. Impaired Waters in THSF**

Group Name	Receiving Body of Water	Impaired Classification
Ochlockonee-St. Marks	Ochlockonee River ¹	Verified impaired due to mercury in fish
	Crooked River ¹	Verified impaired due to mercury in fish
Apalachicola-Chipola	New River	Verified impaired due to mercury in fish
	Cash Creek	Verified impaired due to bacteria in shellfish
	East River	Verified impaired due to bacteria in shellfish
	Doyle Creek	Verified impaired due to bacteria in shellfish
	Whiskey George Creek	Verified impaired due to bacteria in shellfish
	Crooked River ¹	Verified impaired due to mercury in fish and fish consumption advisory
	Direct runoff to bay	Verified impaired due to bacteria in shellfish and mercury in fish
	East Bayou	Verified impaired due to bacteria in shellfish and mercury in fish
East Bay	Verified impaired due to evidence of fecal coliform, bacteria in shellfish, and mercury in fish	

* Classified as 303d impaired waters

21 **6.7.1.2 Wetlands**

22 Wetlands at THSF are spread extensively throughout the area. There are 181,476 acres of
 23 wetlands at THSF, including nearly 179,949 acres of palustrine or freshwater wetlands, 1,300
 24 acres of estuarine wetlands, 44 acres of lacustrine wetlands, and 183 acres of riverine
 25 wetlands ([Table 6-30](#)). Palustrine or freshwater wetlands include forested wetlands, scrub-
 26 shrub wetlands, emergent wetlands, and ponds. Lacustrine wetlands include deepwater

1 habitat (depths greater than 6.6 feet) associated with lakes. Estuarine wetlands consist of
 2 vegetated or unvegetated tidal wetlands in areas that are permanently submerged or
 3 periodically exposed during low tides. Riverine wetlands occur entirely within stream
 4 channels of tidal and nontidal, low-gradient, perennial streams (Cowardin et al., 1979).

5 [Figure 6-30](#) provides an overview of wetlands at [Figure 6-31](#) through [Figure 6-40](#) provide
 6 more detailed views of wetlands in each TA at THSF.

7 **Table 6-30. Wetlands Summary for THSF (acres)**

Wetland Type	Wetland Subtype	Tactical Area (TA)										Total
		1	2	3	4	5	6	7	8	9	10	
Palustrine	Forest	8,551	16,148	8,785	19,481	25,164	12,659	6,811	13,668	16,934	16,121	144,322
	Scrub-shrub	3,453	11,968	2,420	3,524	1,479	1,790	3,677	1,782	3,397	1,505	34,995
	Emergent	36		7		28	114	52			47	284
	Ponds	15		4		8	8	9		9	25	78
Subtotal		12,055	28,116	11,216	23,005	26,679	14,751	10,549	15,540	20,340	17,698	179,949
Riverine	Instream	1		154			10	18				183

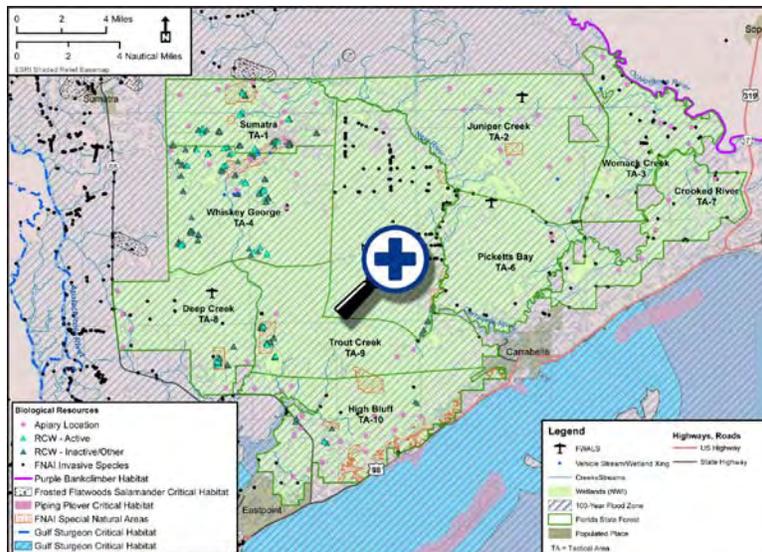


Figure 6-30. Water and Biological Resources at THSF – Overview

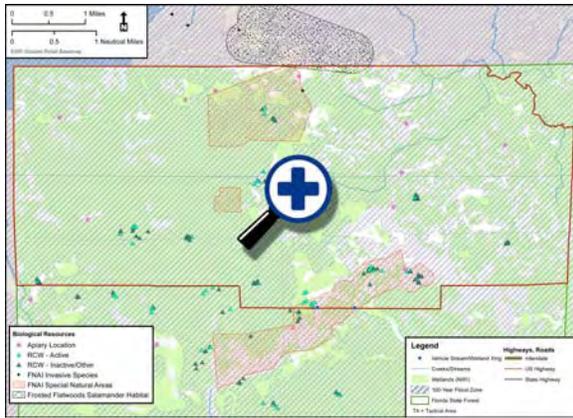


Figure 6-31. Water and Biological Resources – TA-1 at THSF



Figure 6-32. Water and Biological Resources – TA-2 at THSF

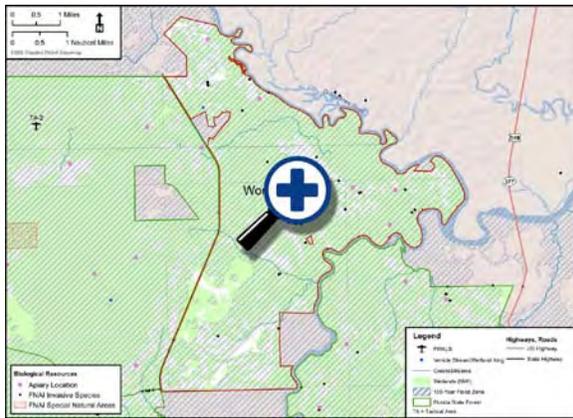


Figure 6-33. Water and Biological Resources – TA-3 at THSF

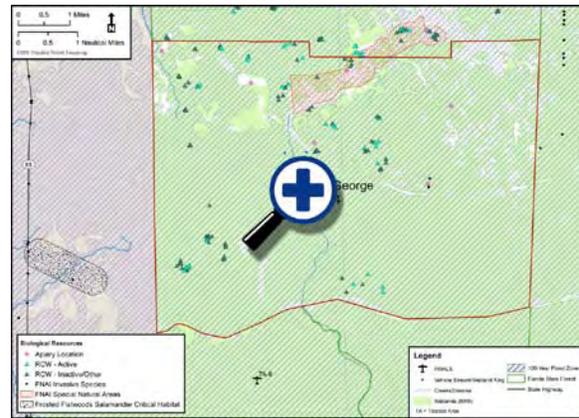


Figure 6-34. Water and Biological Resources – TA-4 at THSF

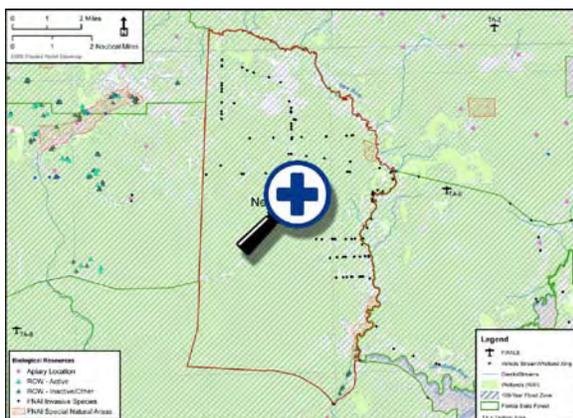


Figure 6-35. Water and Biological Resources – TA-5 at THSF

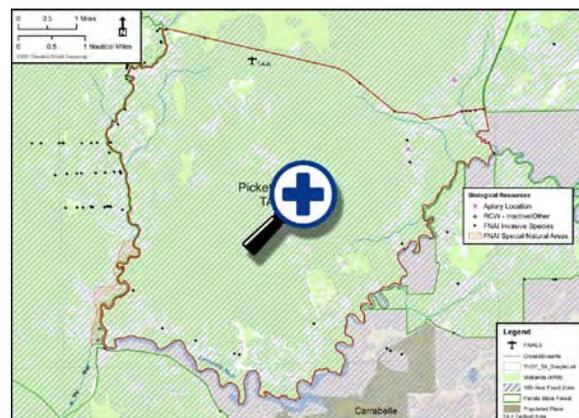


Figure 6-36. Water and Biological Resources – TA-6 at THSF

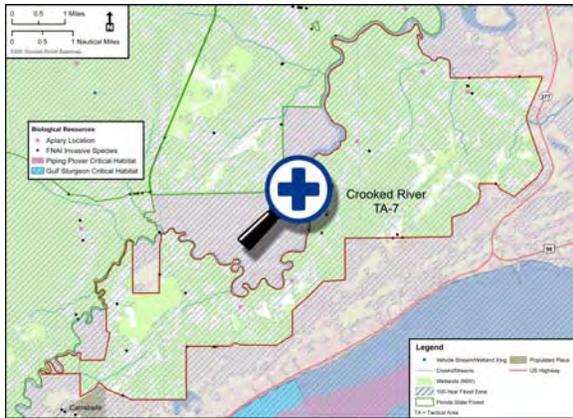


Figure 6-37. Water and Biological Resources – TA-7 at THSF

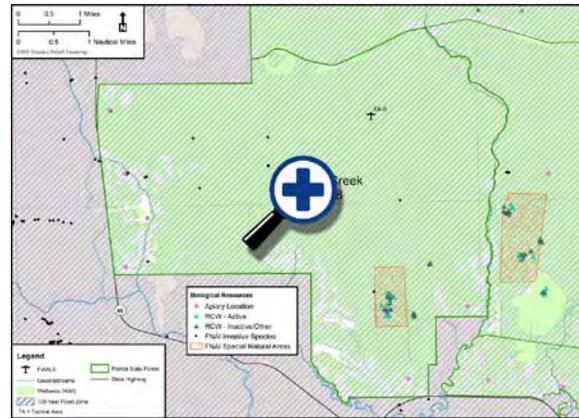


Figure 6-38. Water and Biological Resources – TA-8 at THSF

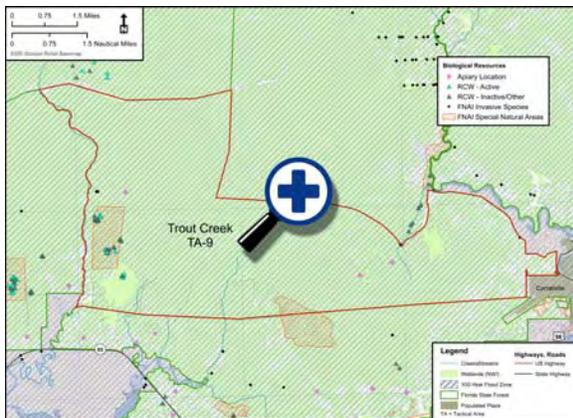


Figure 6-39. Water and Biological Resources – TA-9 at THSF

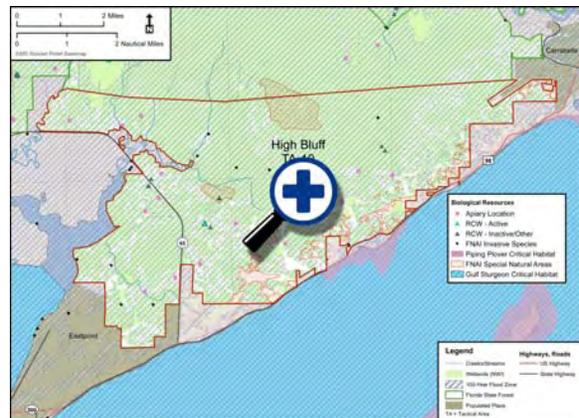


Figure 6-40. Water and Biological Resources – TA-10 at THSF

1 **6.7.1.3 Floodplains**

2 THSF is dominated by low-lying, poorly drained topography. As a result, floodplains are
 3 distributed extensively throughout the area. In all, 193,786 acres of floodplains have been
 4 mapped at THSF (Table 6-31). Figure 6-30 provides an overview of floodplains at THSF.
 5 Figure 6-31 through Figure 6-40 provide more detailed views of the distribution of wetlands
 6 in each TA at THSF.

7 **Table 6-31. Floodplain Summary for THSF (acres)**

Tactical Area (TA)										
1	2	3	4	5	6	7	8	9	10	Total
13,226	29,243	14,756	23,560	28,461	16,075	11,767	16,133	20,253	20,312	193,786

8 **6.7.2 Environmental Consequences**

9 As discussed in Section 3.7, potential adverse impacts to water resources may occur from use
 10 of wheeled vehicles, dismounted maneuvers, and AO. Other Proposed Action effectors are
 11 not addressed in this section. Impacts to THSF water resources identified in Section 6.7.1
 12 would generally be the same as those described in Section 3.7. Impact assessment considers
 13 implementation of the General Operational Constraints inherent to the Proposed Action as

1 identified in Section 2.5. These constraints, such as establishment of buffers around sensitive
 2 water resource locations and habitats, would minimize potentially adverse impacts and, in
 3 some cases, avoid adverse impacts altogether. Avoidance areas for water resources are
 4 identified in [Figure 6-1](#) through [Figure 6-11](#).

5 **6.7.2.1 Water Resource Protection Levels**

6 Water resource protection levels were defined based on current environmental management
 7 requirements at Eglin AFB (EAFBI 13-212; U.S. Air Force, 2012). Water resources fall within the
 8 LU-1 protection level as described in Section 5.1 and shown in [Figure 6-1](#) through [Figure 6-11](#)
 9 as solid yellow. The LU-1 protection level would affect all surface water bodies (streams,
 10 ponds, and lakes), wetlands, and floodplains and a 100-foot buffer zone around these
 11 resources. No land disturbance would be permitted outside of previously disturbed roadbeds
 12 and road shoulders. Dismounted maneuvers and AO would be allowed, but concentrated
 13 troop movements would not be allowed on steep slopes, streambanks/shorelines, and
 14 wetlands. Pyrotechnic use in wetlands at THSF would be limited only to star clusters.

15 Wheeled vehicle use would be restricted to existing, approved roads and trails in each TA.
 16 Wheeled vehicle use of stream and wetland crossings would be restricted to FFS-identified
 17 crossings at THSF. Data on stream and wetland crossing conditions for THSF are unavailable
 18 from the FFS. For purposes of analysis, each crossing was assumed to be in fair condition;
 19 however, prior to use the Air Force would coordinate with the FFS to evaluate each crossing
 20 and determine its relative condition to determine whether the crossing is "good," fair," or
 21 "poor." Vehicle access would be prohibited at stream and wetland crossings rated in poor
 22 condition. [Table 6-32](#) summarizes the stream and wetland crossings at each TA at THSF, while
 23 [Figure 6-1](#) through [Figure 6-11](#) show their locations. Each crossing is shown in light blue.

24 **Table 6-32. Stream/Wetland Road Crossing Condition Summary, THSF**

Surface Water/Wetland	Crossing Condition ¹	Tactical Area										Total
		1	2	3	4	5	6	7	8	9	10	
	Fair	2	1	1	3	0	0	0	0	0	0	7

1. Data on stream and wetland crossing conditions for THSF are unavailable from the FFS. For purposes of analysis, each crossing was assumed to be in fair condition.

25 Restrictions under the LU-1 protection level would prevent any land development activities or
 26 ground disturbance activities on a total of 202,264 acres or 98.75 percent of THSF (see
 27 [Table 6-33](#)). These restrictions in each TA range from 12,975 acres to 31,207 acres
 28 (95.95 percent to 99.92 percent of each TA). [Figure 6-1](#) through [Figure 6-11](#) provide more
 29 detailed views of water resource avoidance areas in each TA at THSF. LU-1 areas are identified
 30 in each figure as solid yellow.

31 **Table 6-33. Water Resource Protection Level Summary, THSF**

Protection Level	Tactical Area										Total
	1	2	3	4	5	6	7	8	9	10	
LU-1 (acres)	14,498	31,207	13,725	24,572	29,110	16,734	12,975	16,455	21,015	21,973	202,264
% area affected	97.77	99.58	97.95	99.14	99.74	99.22	97.29	99.54	99.92	95.95	98.75

LU-1 = Limited Use 1

32 **6.7.2.2 Ground Movement**

33 Wheeled vehicle use and CCDM could affect water resources at THSF.

1 **Wheeled Vehicle Use**

2 Wheeled vehicle use would not directly affect surface water resources, since vehicles would
3 not be allowed direct access to any surface waters or wetlands under the LU-1 protection
4 level. Vehicle use would be restricted to existing roads and trails and approved, existing
5 crossing locations in streams and wetlands.

6 Wheeled vehicle activities could indirectly affect water resources at THSF. Routine use of the
7 existing dirt road network at THSF that extends throughout the TAs is a regular contributor to
8 roadway erosion, and a recognized problem affecting some streams and wetlands (FDOF,
9 2000). Leaks of fuel and other vehicle fluids would also be a potential indirect source of
10 contamination to water resources as described under land improvement effects. Some
11 indirect effects to water resources from roadway erosion are likely and assumed to occur.
12 While the potential for these occurrences are inherent to vehicle use (whether for the military,
13 the FFS, or civilians) and unavoidable, implementation of standard vehicle maintenance and
14 spill prevention SOPs would minimize the potential for occurrence to a negligible level.

15 **Dismounted Movements**

16 Dismounted troop movement could impact surface water and wetland resources in all TAs at
17 THSF. Potential effects would be direct but minor. Rotation of any stream or water body
18 ingress/egress areas would minimize the potential for any medium- to long-term impacts
19 associated with shoreline erosion, and units would be advised to avoid any noticeably eroded
20 shorelines. Over the short term, sediments in the fast-flowing streams typical of those found
21 at THSF would settle rapidly and water clarity would return, causing the streams to return to
22 their former state once units move out of the area.

23 **6.7.2.3 Amphibious Operations**

24 AO could impact surface waters and wetland resources in TA-10 (High Bluff) at THSF. As
25 discussed in Section [3.7](#), AO could result in disturbance of streambeds and shorelines from
26 the loading and unloading of watercraft and movement of watercraft on the surface waters,
27 as well as ingress/egress of troops over the land/water interface as discussed in detail in the
28 *Riverine/Estuarine Programmatic Environmental Assessment* (U.S. Air Force, 2004). AO would
29 adhere to the General Operational Constraints and mitigations identified in Section [2.6](#)
30 associated with EAFBI 13-212, Section 7.2.9. Impacts to water resources would be minimized
31 to levels less than significant by limiting activity to designated landing zones and rotating
32 landing zones when these areas show signs of erosion. Fuel could be released from
33 watercraft to surface waters, however, this is inherent to watercraft use (whether military or
34 civilian). Such potential for adverse impacts are minimized to a negligible level by
35 implementation of SOPs for watercraft maintenance and spill prevention procedures, as
36 identified in Section [3.12](#).

37 **6.7.3 Water Resources Impact Summary**

38 [Table 3-32](#) describes the context, intensity, and duration factors utilized in analysis for
39 impacts to water resources; based on these factors the Air Force has identified insignificant
40 adverse impacts to water resources. In summary, there are unavoidable, direct, adverse
41 impacts to wetlands from ISDs associated with ground movement and AO. However, these
42 impacts would be minimized through implementation of General Operational Constraints

1 and Proposed Resource-Specific Mitigations identified in Section 2.5 and 3.7.4, respectively.
 2 Water quality impacts would not be expected to impact public health or safety. No USACE
 3 Section 404 permitting requirements have been identified.

4 **Table 6-34** summarizes the impacts identified. Impacts are categorized as follows:

- 5 • Adverse (yellow)
- 6 • Neutral/no effect (green)

7 **Table 6-34. Surface Water and Wetland Impacts Summary – THSF**

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	Floodplains would not be affected. However, while wheeled vehicles would be required to utilize existing and approved roadways and water and wetland crossings, unavoidable adverse impacts to surface waters and wetlands may occur from wheeled vehicles at water/wetland crossings. Minor impacts may be associated with indirect impacts from oil drips, etc., from vehicles. Mitigations to prevent environmental damage, as described in Section 3.7.4, include use of only stream crossings rated "good" or "fair" for training exercises and avoiding use of crossings rated "poor." Leaks of vehicle fluids would be mitigated through proper vehicle maintenance and spill kits for field use. Implementation of these mitigations and constraints would minimize the potential for impacts from "yellow" to "green" by decreasing the potential for vehicle interaction with degraded resources and the potential for any spills to occur.									
Dismounted movement	Floodplains would not be affected. There is a potential for localized disturbance to shoreline and wetland vegetation (e.g., trampling) from personnel. This would be minor and recoverable over the short term. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.6 (such as frequently rotating tactical area use and minimizing unit size) would result in reduction of adverse impacts from "yellow" to "green" by minimizing the potential for excessive trampling and allowing natural recovery processes.									
Use of Expendables										
Blanks/GBS	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).									
Smoke grenades										
Other/equipment										
Aircraft Operations	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).									
Amphibious Operations	Floodplains would not be affected. Boat landings and nearshore activities could result in shoreline erosion in streams and rivers. Activities in estuarine areas could affect wetlands, as could water-land transition actions. These impacts would be adverse, but they would be localized and recoverable over the short term under natural processes. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.6 (such as using only designated ingress/egress points and rotating water/land transition areas) would result in reduction of adverse impacts from "yellow" to "green" by minimizing the potential for erosion, allowing natural recovery processes.									
Utilities	The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7).									

6.7.4 Proposed Resource-Specific Mitigations

The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has recommended the following conservation measure: avoidance of "Good" and "Poor" rated vehicle water crossings for training use in order to protect the better crossing sites and minimize further degradation of the sites in poor condition.

No additional Resource-Specific Mitigations for water resources have been identified. All General Operational Constraints (Section 2.5) and Proposed Resource-Specific Mitigations (Section 3.7.4) identified previously would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

6.8 BIOLOGICAL RESOURCES

6.8.1 Affected Environment

Figure 6-30 provides an overview of biological resources at THSF. Figure 6-31 through Figure 6-40 provide more detailed views of biological resources in each TA at THSF.

6.8.1.1 Vegetation

Descriptions of vegetation within THSF are based on ecological community categories used by the Florida Natural Area Inventory and the FFS. Table 6-35 lists representative vegetation species within each ecological community.

Table 6-35. Ecological Communities Within THSF

Community	Description
Sand pine scrub	Occurs on well-drained soils on relict coastal dune ridges. Sand pine (<i>Pinus clausa choctawhatchee</i>) dominates the canopy. Other species include shrubs such as myrtle oak (<i>Quercus myrtifolia</i>), sand live oak (<i>Quercus geminata</i>), saw palmetto (<i>Serenoa repens</i>), and Florida rosemary (<i>Ceratiola ericoides</i>), and lichens are common groundcover. Most sand pine scrub areas in THSF are undisturbed.
Mesic flatwoods	Occurs on moderately drained sandy soils. Most natural areas of mesic flatwoods in THSF were converted to stands of slash pine plantation, but restoration efforts to reestablish the historical longleaf pine are under way. Other plant species included a low dense groundcover of wiregrass (<i>Aristida stricta</i>), Florida dropseed (<i>Sporobolus floridanus</i>) bracken fern (<i>Pteridium aquilinum</i>), saw palmetto, and other low shrubs and grasses.
Wet/mesic flatwoods	Occur on poorly drained soils. Most natural areas of wet/mesic flatwoods have been converted to planted pine. Fire suppression has allowed titi shrubs to establish a dense mid-story, which under natural conditions would not exist. Wet/mesic flatwoods naturally have a widely spaced canopy of slash, pond, or longleaf pine and a grassy or shrubby understory consisting of titi (<i>Cliftonia monophylla</i> and <i>Cyrilla racemiflora</i>), sweet gallberry (<i>Ilex coriacea</i>), bitter gallberry (<i>Ilex gabra</i>), and St. John's wort (<i>Hypericum</i> spp.). Groundcover species include wiregrass, beakrushes (<i>Rhynchospora</i> spp.), panic grasses (<i>Panicum</i> spp.), nutrushes (<i>Sceleria</i> spp.), and sundews (<i>Drosera</i> spp.).
Wet savannas	Occur on poorly drained soils. Serve as transition areas between wet flatwoods and deciduous or mixed forested wetlands. Grassy open areas with few trees. Seasonally saturated and often contain rare plants such as pitcher plants (<i>Sarracenia</i> spp.), dew-threads (<i>Drosera tracyi</i>), and grass-pink orchids (<i>Calopogon</i> spp.). In THSF, most of these areas were converted to slash pine plantation. The Florida Division of Forestry has begun restoring wet savannas through a program of thinning planted pines, applying prescribed burns, and re-creating historical drainage patterns.
Wet savanna – cypress flats	Occurs on poorly drained soils. Savanna-type habitats with widely separated pond cypress (<i>Taxodium ascendens</i>) and slash pine with a shrub/small cypress mid-story. Fire suppression fosters growth and

Table 6-35. Ecological Communities Within THSF, Cont'd

Community	Description
	invasion and domination of titi and other shrubs. Forest road and ditch removal and reestablishment of historical drainage patterns are measures employed to restore this habitat type.
Basin swamps/shrub and mixed forested wetlands	A mix of wetland types that occur on poorly drained soils and in depressional features of low topography. May be inundated at times throughout the year. Mixed pond cypress—titi forests, shrub wetlands, Atlantic White Cedar (<i>Chamaecyparis thyoides</i>) swamps, black gum (<i>Nyssa biflora</i>)—bay forests, slash pine/cypress/bay swamps, and other mixtures of canopy trees and shrubs are common. Fire suppression has led to natural vegetation becoming dense and overgrown.
Shrub wetlands	Occur on poorly drained soils. Dominated by black titi (<i>Cliftonia monophylla</i>), white titi (<i>Cyrilla racemiflora</i>), and gallberry. Overgrowth results without fire suppression. Large areas of remnant shrub wetlands are found east of State Road 67 in THSF.
Deciduous forested wetlands	Occur on poorly drained soil, with standing water present for much of the year. Includes cypress sloughs, dwarf cypress swamps, riverine bald cypress (<i>Taxodium distichum</i>) swamps, and smaller forested wetlands having canopies of pond cypress (<i>Taxodium ascendens</i>), red maple (<i>Acer rubrum</i>), tulip tree (<i>Liriodendron tulipifera</i>), or black gum. Dwarf cypress trees are unique due to their stunted height of only 15 feet; however, they can live more than 300 years.
Marshes	Water present usually year-round, fluctuating with tidal or rainfall cycles. Associated with lower reaches of New, Carabelle, and Crooked Rivers and Whiskey George and Cash Creeks; also present as isolated marshes within THSF. May be fresh or brackish. Typical vegetation of riverine marshes includes sawgrass (<i>Cladium jamaicense</i>), black needle rush (<i>Juncus roemerianus</i>), and salt cordgrass (<i>Spartina alterniflora</i>). Typical vegetation in isolated freshwater marshes includes grasses, rushes, sedges, herbaceous plants, and floating aquatics.

Source: FNAI, 2010; FDACS, 2007

THSF = Tate's Hell State Forest

1 **6.8.1.2 Wildlife**

2 THSF is a WMA. Its game species are regulated and managed by the FWC. In addition to
3 protected wildlife species discussed in Section [6.8.1.3](#), THSF support numerous other wildlife
4 species, including mammals, birds, fish, reptiles, and amphibians. Mammals include raccoons
5 (*Procyon lotor*), coyotes (*Canis latrans*), river otters (*Lutra canadensis*), and white-tailed deer
6 (*Odocoileus virginianus*). Birds include eastern wild turkey (*Meleagris gallopavo silvestris*),
7 several species of sparrows, raptors, wading birds, and ducks (FWC, 2013b). In the fall and
8 winter, almost 90 different migratory bird species may visit THSF (NFWFMD-FFS, 2010a;
9 NFWFMD-FFS, 2010b). Migratory birds are protected under the Migratory Bird Treaty Act (16
10 USC 703–712) and EO 913186. A migratory bird is defined by the USFWS as any species or
11 family of birds that lives, reproduces, or migrates within or across international borders at
12 some point during the annual life cycle. Federal agencies are to integrate bird conservation
13 principles, measures, and practices into agency activities and avoid or minimize adverse
14 impacts on migratory bird resources. Also, federal agencies must notify the USFWS in advance
15 of conducting an action that is intended to take migratory birds. The American alligator
16 (*Alligator mississippiensis*) and Florida cottonmouth (*Agkistrodon piscivorus conanti*) are
17 notable reptiles. Amphibians include frogs, toads, and salamanders. There are several apiary
18 (bee-keeping) operations throughout THSF. [Table 6-36](#) lists known apiary operations
19 associated with the tactical areas.

Table 6-36. Presence of Apiaries Within THSF Tactical Areas

Number of Apiaries	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
	10	13	6	6	0	1	6	6	3	16

6.8.1.3 Protected Species

There are six animals federally listed under the ESA and three federally listed ESA plant species within THSF or in waters adjacent to the TAs. Additionally, the bald eagle is afforded protection under the BEPA, and bottlenose dolphins, which occur in waters adjacent to TA-10, have federal protection under the MMPA. Potential impacts from the Proposed Action to federally listed species would require the Air Force to consult with the USFWS, who would then decide whether to issue a biological opinion with terms and conditions for minimizing impacts to federally protected species. As there is a low potential for amphibious operations to adversely interact with bottlenose dolphins, a consultation with the National Marine Fisheries Service (NMFS) would not be required. All federally listed and state-listed species known to occur or with the potential to occur within THSF are provided in [Table 6-37](#). Some bird and wildlife species have the potential to occur throughout several TAs within THSF, depending on habitat associations and feeding habits. Plant species with a recorded occurrence within a particular TA are noted as confirmed in [Table 6-37](#).

Table 6-37. Protected Species Known or Potentially Occurring in THSF

Species ¹	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
●=Confirmed present; ○=Not present; ◻=Potential to occur										
Molluscs										
Purple bankclimber mussel (<i>Elliptioideus sloatianus</i>) FT/ST	○	○	● ²	○	○	○	○	○	○	○
Amphibians										
Frosted flatwoods salamander (<i>Ambystoma cingulatum</i>) FT/SSC	● ³	○	○	○	○	○	○	○	●	●
Gopher frog (<i>Rana capito</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Reptiles										
American alligator (<i>Alligator mississippiensis</i>) FSA/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Eastern indigo snake (<i>Drymarchon corais couperi</i>) FT/ST	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Gopher tortoise (<i>Gopherus polymerus</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Alligator snapping turtle (<i>Macrolemys temminckii</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Mammals										
Florida mouse (<i>Podomys floridanus</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Florida black bear (<i>Ursus americanus floridanus</i>) N/ST	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Sherman's fox squirrel (<i>Sciurus niger shermani</i>) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻
Bottlenose dolphin (<i>Tursiops truncatus</i>)	○	○	○	○	○	○	○	○	○	●

Table 6-37. Protected Species Known or Potentially Occurring in THSF, Cont'd

Species ¹	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
MMPA										
Birds										
Scott's seaside sparrow (<i>Ammodramus maritimus peninsulae</i>) N/SSC	○	○	○	○	○	○	○	○	○	⊗
Limpkin (<i>Aramus guarana</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Little blue heron (<i>Egretta caerulea</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Reddish egret (<i>Egretta rufescens</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Snowy egret (<i>Egretta thula</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Tricolored heron (<i>Egretta tricolor</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
White ibis (<i>Eudocimus albus</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Southeastern American kestrel (<i>Falco sparverius paulus</i>) N/ST	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Bald eagle (<i>Haliaeetus leucocephalus</i>) BEPA	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Woodstork (<i>Mycteria americana</i>) FE/SE	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Osprey (<i>Pandion haliaetus</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Red-cockaded woodpecker (<i>Picoides borealis</i>) FE/SSC	●	○	○	●	●	○	○	●	●	●
Fish										
Gulf sturgeon (<i>Acipenser oxyrinchus desotoi</i>) FT/ST	○	○	○	○	○	○	○	○	○	●
Shoal bass (<i>Micropterus cataractae</i>) N/SSC	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Plants										
Narrow-leaved bluestem (<i>Andropogon arctatus</i>) N/ST	●	⊗	⊗	●	●	⊗	⊗	⊗	⊗	⊗
Southern milkweed (<i>Asclepias viridula</i>) N/ST	●	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Scareweed (<i>Baptisia simplicifolia</i>) N/ST	●	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Spoon-leaved sundew (<i>Drosera intermedia</i>) N/ST	⊗	●	⊗	⊗	⊗	⊗	⊗	●	⊗	⊗
Wiregrass gentian (<i>Gentiana pennelliana</i>) N/SE	⊗	⊗	⊗	⊗	●	⊗	⊗	⊗	⊗	⊗
Henry's spider lily (<i>Hymenocallis henryae</i>) N/SE	●	⊗	⊗	●	⊗	⊗	⊗	⊗	⊗	⊗
Water willow (<i>Justicia crassifolia</i>) N/SE	●	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Godfrey's blazing star (<i>Liatris provincialis</i>) N/SE	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●
West's flax (<i>Linum westii</i>)	⊗	●	⊗	⊗	●	⊗	⊗	⊗	⊗	⊗

Table 6-37. Protected Species Known or Potentially Occurring in THSF, Cont'd

Species ¹	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
N/SE										
Gulf coast lupine (<i>Lupinus westianus</i>) N/ST	○	○	○	○	○	○	○	○	○	●
Curtiss loosestrife (<i>Lythrum curtissii</i>) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	●
White birds-in-a-nest (<i>Macbridea alba</i>) FT/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hummingbird flower (<i>Macranthera flamma</i>) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Florida beargrass (<i>Nolina atopocarpa</i>) N/ST	☐	☐	☐	●	●	☐	☐	☐	☐	☐
Carolina grass-of-parnassus (<i>Parnassia caroliniana</i>) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pinewood false sunflower (<i>Pheobanthus tenuifolia</i>) N/ST	☐	☐	☐	☐	☐	☐	☐	☐	☐	●
Apalachicola dragonhead (<i>Physotegia godfreyi</i>) N/ST	●	☐	☐	☐	●	☐	☐	☐	☐	☐
Godfrey's butterwort (<i>Pinguicula ionantha</i>) FT/SE	●	●	☐	●	●	☐	☐	☐	●	●
Large-leaved jointweed (<i>Polygonella macrophylla</i>) N/ST	○	○	○	○	○	○	○	○	○	●
Small flowered meadowbeauty (<i>Rhexia parviflora</i>) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Narrow-leaved beakrush (<i>Rhynchospora stenophylla</i>) N/ST	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Night flowering petunia (<i>Ruellia noctiflora</i>) N/SE	●	●	☐	☐	●	☐	☐	☐	☐	●
White-top pitcher plant (<i>Sarracenia leucophylla</i>) N/SE	☐	☐	☐	☐	☐	☐	☐	●	●	●
Florida skullcap (<i>Scutellaria floridana</i>) FT/SE	☐	☐	☐	☐	☐	☐	☐	●	☐	☐

Source: FNAI, 2013b; FDACS, 2007

BEPA = Bald Eagle Protection Act; FSA = federally listed due to similarity of appearance; FT = federally threatened; MMPA = Marine Mammal Protection Act; N = no status; SSC = state species of concern; ST = state threatened

●=Confirmed present; ○=Not present; ☐=Potential to occur

1. Descriptions of most species can be found at <http://fnai.org/bioticssearch.cfm>.

2. Critical habitat occurs within TA-3.

3. Critical habitat occurs within and adjacent to TA-1.

1 6.8.1.4 Sensitive Habitats

2 The Florida Natural Areas Inventory has identified high-quality sensitive habitats within THSF.
3 The combined acreages of sensitive habitats within TAs are listed in [Table 6-38](#) and depicted
4 in [Figure 6-30](#) through [Figure 6-40](#). Piping plover and Gulf sturgeon critical habitat occur on
5 TA-10 or within adjacent waters (CFR, 2001, 2003). Critical habitat for the purple bankclimber
6 mussel occurs on TA-3, and critical habitat for the frosted flatwood salamander occurs within
7 and adjacent to TA-1 (CFR, 2007, 2009).

Table 6-38. Occurrence of Sensitive Habitats Within THSF Tactical Areas

Sensitive Habitat Type ¹	Tactical Area (TA) (acres)									
	1	2	3	4	5	6	7	8	9	10
Wet prairie	813	253	0	326	0	577	0			
Mesic flatwoods	0									287
Wet flatwoods/strand swamp	401	0	589	0	307	0				
Basin swamp	0								138	499
Scrub	0									712

Source: FFS, 2012b

1. Descriptions of habitats can be found in [Table 6-35](#) and at http://www.fnai.org/pdf/Natcom_shortdesc_Nov2010.pdf (FNAI, 2010).

6.8.1.5 Invasive Species

[Table 6-39](#) lists the numbers of documented invasive plant species locations within the TAs. Invasive species have the potential to compete with and displace native species. The locations correspond to the invasive species points shown on [Figure 6-30](#) through [Figure 6-40](#).

Table 6-39. Tactical Areas with Invasive Species

Invasive Species	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Documented occurrence (number of locations)	1	8	28	2	>100	24	21	12	4	7

Source: FNAI, 2011

6.8.2 Environmental Consequences

As discussed in Section [3.8](#), potential adverse impacts to biological resources may occur from dismantled maneuvers, UoEX, and aircraft and AO. Other proposed action effectors are not addressed in this section. The general analysis presented in Section [3.8](#) covers potential impacts to affected environment resources identified in Section [6.8.1](#).

Impact assessment considers implementation of the General Operational Constraints inherent to the Proposed Action as identified in Section [2.5](#). These constraints, such as establishment of buffers around sensitive species locations and habitat, serve to minimize potentially adverse impacts and, in some cases, avoid adverse impacts altogether. Avoidance areas for biological resources are identified in [Figure 6-1](#) through [Figure 6-11](#) and [Figure 6-12](#) through [Figure 6-22](#). General Operational Constraints identified in Section [2.5](#) requires that all identified sensitive species locations and habitat would be protected, and aspects of EAFBI

1 13-212 and Eglin AFB sensitive species consultations would be implemented as part of the
2 Proposed Action.

3 Additionally, impact analyses rely heavily on analysis and results as presented in the *Interstitial*
4 *Area Range Final Environmental Assessment Revision 2, Eglin AFB Interstitial Area Biological*
5 *Assessment, Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion, and the*
6 *Eglin AFB Riverine/Estuarine Biological Assessment*. These documents analyze potential impacts
7 to resources on the Eglin Range from activities associated with the Proposed Action. Impacts
8 to THSF biological resources identified in Section [6.8.1](#) would be the same as those described
9 in Section [3.8](#).

10 **6.8.2.1 Vegetation**

11 [Table 6-40](#) lists impacts to vegetation in each TA. Impacts are categorized as follows: adverse
12 (yellow) and neutral/no effect (green). Most impacts to vegetation would be related to
13 temporary disturbances, such as trampling associated with ground movements, landing of
14 aircraft, or minor ground disturbance, and would be recoverable through natural processes.

15 **Table 6-40. Vegetation Impacts by TA at THSF**

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).									
Point impact										
Incidental Surface Disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).									
Dismounted movement	Adverse impacts would be from incidental direct physical impact (trampling). The intensity of the impacts would be minimized given implementation of General Operational Constraints and Proposed Resource-Specific Mitigations associated with regulating unit size and rotating use areas, thus allowing recovery of vegetation over the short term.									
Use Expendables										
Blanks/GBS	Potential adverse impacts associated with increased wildfire potential from expendables and equipment usage. This increased potential would be unavoidable, and would persist over the long term. However, implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices would reduce the intensity of the impacts.									
Smoke grenades										
Other/equipment	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).									
Aircraft Operations	The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8).									
Amphibious Operations	Potential adverse impacts to shoreline and aquatic vegetation due to trampling/rutting associated with landing of watercraft along shorelines. Impacts would be short term and recoverable through Proposed Resource-Specific Mitigations such as rotation of established landing sites.									

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

1 Potential wildfires resulting from expendables would impact THSF ecological communities.
 2 Generally, controlled fire can be beneficial to ecological communities and species by
 3 maintaining the grassy understory and preventing mid-story encroachment. However,
 4 wildfires can damage the habitats of species that rely on these communities. According to
 5 the *Final Environmental Assessment for the Eglin AFB Integrated Natural Resource Management*
 6 *Plan Activities*, Eglin averages 110 wildfires annually, with an average size of 60 acres; the
 7 majority of these wildfires are due to mission activities, primarily ordnance and pyrotechnics
 8 use (U.S. Air Force, 2013a). By comparison, THSF averages four wildfires annually, with an
 9 average size of 40 acres (FDACS, 2007). The FFS utilizes a fire management program that
 10 includes wildfire prevention, detection and suppression, and prescribed burning. Adherence
 11 to FFS and Eglin fire management procedures as outlined in Section 2.5 would serve to
 12 minimize wildfire occurrence. As a result the Air Force does not consider this potential to be
 13 significant.

14 6.8.2.2 Wildlife

15 The Proposed Action would potentially cause adverse impacts to wildlife, including migratory
 16 birds. Because military readiness activities are exempt from the Migratory Bird Treaty Act,
 17 except in cases where significant adverse impacts to a population are likely, the Proposed
 18 Action is exempt from incidental takes to migratory birds. A consultation with the USFWS
 19 associated with migratory birds is not required. Table 6-41 lists impacts to wildlife in each TA.
 20 Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green). Impacts
 21 would be related to temporary disturbances associated with harassment and/or displacement
 22 associated with general training activity, minor land disturbances, and wildfire potential.
 23 Permanent disturbances associated with consumption of wildlife would also adversely impact
 24 individual species. However, consumption would be intermittent and recoverable through
 25 natural processes and would result in a negligible long-term impact.

26 **Table 6-41. Wildlife Impacts by TA at THSF**

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8).									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8).									
Dismounted movement	Potential for incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). The probability of impact is low as a result of implementation of General Operational Constraints.									
Use of Expendables										
Blanks/GBS	There is a potential for adverse impact associated with increased wildfire potential from expendables									

Table 6-41. Level of Impact Significance on Wildlife by TA at THSF, Cont'd

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Smoke grenades	usage. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices.									
Other/equipment	The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8).									
Aircraft Operations	Potential adverse impacts associated with disturbance from noise. However, aircraft noise would be temporary and intermittent in nature, allowing any dispersed wildlife to return to the area once aircraft have left the area.									
Amphibious Operations	Increased potential for direct physical impact by boat strike or indirect impact by disturbance or harassment. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations.									

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

1 6.8.2.3 Protected Species

2 As discussed in Section 3.8, protected species could be directly impacted by vehicle collisions,
 3 land disturbance, noise from aircraft operations and expendables, and potential wildfire from
 4 expendable use. Further, the effector mechanisms of noise and human activity related to
 5 military training are not unlike that of recreational hunting, logging, and other human
 6 activities that have been conducted at THSF for many years. Thus, some species may have
 7 acclimated to noise and other disturbances. Vehicles would operate at or under 35 mph on
 8 THSF dirt roads, which should reduce the chance for collision with bears, indigo snakes, or
 9 other animals that have been struck by vehicles in the past.

10 AO in TA 10 would move through Gulf sturgeon critical habitat, but the activities would not
 11 alter or disturb this species or its habitat. Usage of the water areas for AO and landings would
 12 be similar to current recreational and commercial use, which have no effect on Gulf sturgeon.

13 Noise-generating expendables (blanks/GBS) would be used throughout THSF with exception
 14 of noise constraint areas identified in Figure 6-12 through Figure 6-22.

15 Figure 6-1 through Figure 6-11 show buffer areas where sensitive species occur. In these
 16 buffer areas, training activities would either be restricted or limited at point locations.
 17 Sections 2.5 and 3.8.4 identify General Operational Constraints and Proposed Resource-
 18 Specific Mitigations associated with sensitive species.

19 Table 6-42 lists impacts to protected species in each TA. Impacts are categorized as follows:
 20 adverse (yellow) and neutral/no effect (green). Most impacts would be related to temporary
 21 disturbances, which would be minimized by avoidance measures.

1

Table 6-42. Protected Species Impacts by TA at THSF

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	Known protected species locations would be protected (see Figure 6-1 through Figure 6-22). The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section 3.8).									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section 3.8).									
Dismounted Movement	Known protected species locations would be protected (see Figure 6-1 through Figure 6-22). Potential direct physical impacts resulting in mortality, trampling, or disturbance of transient protected species. Short-term, localized impacts; while unavoidable, potential for occurrence can be mitigated by distributing educational materials to familiarize personnel with protected species so that troops can avoid transient species where possible. Additionally, established buffer areas around protected species habitats would be utilized.									
Use of Expendables										
Blanks/GBS	Use of Expendables would avoid known protected species locations (see Figure 6-1 through Figure 6-22). Utilization of blanks and GBSs would be restricted to identified areas, thus minimizing potential noise impacts. Potential adverse impacts associated with increased wildfire potential from utilization of expendables is unavoidable. These impacts are regional in context and long term in duration. Wildfire potential would be mitigated through implementation of safety requirements and adherence to THSF and Eglin AFB wildfire management practices.									
Smoke grenades										
Other/equipment	The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8).									
Aircraft Operations	Potential adverse impacts associated with noise disturbance. Impacts would be short term, localized, and mitigated through avoidance of known species locations and associated habitat (see Figure 6-1 through Figure 6-22), resulting in unavoidable, intermittent impacts to transient species. However, these impacts would not be considered significant given the context, intensity, and duration.									
Amphibious Operations	Known protected species locations would be protected (see Figure 6-1 through Figure 6-22). Potential for incidental direct physical impacts (boat strike) or incidental indirect impact of transient protected species could result; however, this potential is minimized given the proposed operational frequency and likelihood that any aquatic species would move from harm's way.									

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

2 **6.8.2.4 Sensitive Habitats**

3 Sensitive habitats with the potential to be impacted by the Proposed Action are shown
4 in [Figure 6-30](#) and discussed in Section [6.8.1.4](#). Impacts to vegetation, discussed in
5 Section [6.8.2.1](#), may be applied to sensitive habitats in THSF; however, all known sensitive
6 habitats would be protected to the extent possible during training activities. Areas slated for
7 ground-disturbing activities would be surveyed for gopher tortoises and burrows would be
8 avoided where possible; burrows that cannot be avoided would be relocated in accordance
9 with FWC guidelines. Additionally, expended items could start wildfires that spread into
10 other areas including those with sensitive habitats. Given that some protected and rare plant
11 species within THSF have been noted to be declining, there is potential for localized long-

1 term impacts. The FFS works to prevent impacts to and manage fire-dependent habitats that
 2 support protected species through a program of prescribed burning. Impacts from wildfires
 3 would be minimized to the extent possible through a program of prevention, response, and
 4 coordination with the FFS. Fire suppression activities, such as the use of heavy machinery for
 5 fire response, could result in changes to the landscape, localized alterations to hydrology,
 6 sedimentation, and direct damage to vegetation. Parts of the land-water interface of TA-10
 7 border critical habitat for the wintering population of the piping plover. Piping plover are
 8 especially susceptible to human disturbance. Troops would avoid potential impacts to piping
 9 plover by accessing TA-10 through those areas that do not contain piping plover critical
 10 habitat. [Table 6-43](#) lists impacts to sensitive habitats within each TA. Impacts are categorized
 11 as follows: adverse (yellow) and neutral/no effect (green).

12

Table 6-43. Sensitive Habitat Impacts by TA at THSF

Proposed Action Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	Known sensitive habitats would be protected (see Figure 6-1 through Figure 6-22). The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									
Dismounted movement	Known sensitive habitats would be protected (see Figure 6-1 through Figure 6-22). Potential direct physical impacts resulting in indirect disturbance of sensitive habitats. Short-term, localized impacts; while unavoidable, potential for occurrence can be mitigated through established buffer areas around protected species habitats and other sensitive habitats.									
Use of Expendables										
Blanks/GBS	Figure 6-1 through Figure 6-22 show avoidance areas for sensitive habitats. Potential adverse impacts associated with increased wildfire potential from utilization of expendables would be unavoidable. These impacts would be regional in context and long term in duration. However, given the potential frequency of occurrence based on mission frequency and implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices, wildfire potential would be mitigated.									
Smoke grenades										
Other/equipment	The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									
Aircraft Operations	The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8).									
Amphibious Operations	Potential to adversely affect shoreline vegetation in streams and rivers and marsh vegetation, oyster reefs, and seagrass in estuarine areas. Figure 6-1 through Figure 6-22 show avoidance areas for sensitive habitats. However, impacts would be minimized to a negligible level through rotation of ingress/egress points and avoidance of oyster reefs, and areas exhibiting shoreline erosion as identified in Section 3.7.4 . Any impacts would be recoverable over the short-term with implementation of these specific mitigations.									

AFB = Air Force Base; FFS = Florida Forest Service; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

13 **6.8.2.5 Invasive Species**

14 As discussed in Section [3.8](#), the Proposed Action would potentially cause adverse impacts
 15 associated with the spread of invasive species. Implementation of General Operational

1 Constraints and Resource-Specific Mitigations identified in Sections [2.5](#) and [3.8.4](#) would
 2 reduce the potential of spreading invasive species. [Table 6-44](#) lists invasive species impacts in
 3 each TA. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green).

4 **Table 6-44. Invasive Species Impacts by TA at THSF**

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).									
Incidental surface disturbance										
Point impact										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). The potential for impact would be minimized by implementation of General Operational Constraints.									
Dismounted movement										
Use of Expendables										
Blanks/GBS	Indirectly, burned areas from wildfires started by expendables use could allow establishment and spread of invasives. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices.									
Smoke grenades										
Other/equipment	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).									
Aircraft Operations	The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8).									
Amphibious Operations										

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

5 **6.8.3 Biological Resources Impact Summary**

6 [Table 3-34](#) describes the context, intensity, and duration factors utilized in analysis for
 7 impacts to biological resources; based on these factors the Air Force has identified
 8 insignificant impacts to the natural environment. There are unavoidable adverse impacts to
 9 biological resources from incidental disturbances associated with dismounted maneuvers
 10 and aircraft and AO. Direct unavoidable impacts have also been identified from increased
 11 wildfire potential resulting from training activities. The intensity of any of the identified
 12 impacts would be minimized through implementation of General Operational Constraints
 13 and Proposed Resource-Specific Mitigations identified in Sections [2.5](#) and [3.8.4](#), respectively.
 14 The Air Force completed consultation with USFWS in accordance with Section 7 of the ESA on
 15 April 8, 2014, and has received concurrence on a finding of "Not Likely to Adversely Affect"
 16 sensitive species or habitat (USFWS, 2014). A copy of the Biological Assessment and all
 17 associated correspondence is included in Appendix C, *Consultation Documentation*.

18 [Table 6-45](#) summarizes the impacts identified. Impacts are categorized as follows:

- 19 • Adverse (yellow)
- 20 • Neutral/no effect (green)

1

Table 6-45. Biological Resource Impacts Summary – THSF

Proposed Action Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Land Disturbance	Protected species would be protected.		Known sensitive habitats would be protected.		The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).
Land development	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				
Point impact					
Incidental surface disturbance					
Consumption					
Ground Movement	Known locations of protected species would be protected.		Known sensitive habitats would be protected.		
Wheeled vehicles	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				
Dismounted maneuver	Potential for incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). However, occurrences are expected to be infrequent, and implementation of required General Operational Constraints would reduce the extent of any adverse impacts.				
Use of Expendables	Protected species would be protected.		Known sensitive habitats would be protected.		Indirectly, burned areas from wildfires started by expendables could allow establishment and spread of invasives. This increased potential would be unavoidable and would persist over the long term. However, the potential would be reduced through implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices.
Blanks/GBS	Potential disturbance from noise would be minimal, since noise-generating expendables would be limited in use. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term, allowing species to resume normal activities. Increased potential for wildfire is considered an unavoidable, potentially adverse impact that would persist over the long term. However, given the potential frequency of occurrence based on mission frequency and implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices, the potential impact would be minimized.				
Smoke grenades					
Other/equipment	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				
Aircraft Operations	Potential short-term and intermittent noise disturbance to general wildlife species. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term, allowing species to resume normal activities. Known protected species locations would be protected and not used as HLZs/DZs or FWALS.		The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).		The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).

Table 6-45. Biological Resource Impacts Summary – THSF, Cont'd

Proposed Action Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Amphibious Operations	Potential for incidental direct physical impact (boat strike) or incidental indirect impact (disturbance or harassment). However, while unavoidable, this potential is expected to be negligible given the proposed operational frequency and likelihood that any aquatic species would move from harm's way and/or return to the area once operations have ceased.		Activities in estuarine areas could affect marsh vegetation, oyster reefs, or seagrass, as could water-land transition actions. Boat landings and nearshore activities would potentially affect shoreline vegetation in streams and rivers. Given proposed frequency of operation and the implementation of General Operational Constraints and Proposed Resource-Specific Mitigations (e.g., rotation of landing sites) the potential for this occurrence is expected to be minimal.		
Utilities	The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8).				

AFB = Air Force Base; DZ = drop zone; FWALS = Fixed-Wing Aircraft Landing Sites; GBS = ground burst simulator; HLZ = helicopter landing zone; TA = tactical area; THSF = Tate's Hell State Forest

1 **6.8.4 Proposed Resource-Specific Mitigations**

2 In addition to the general operation constraints identified in Section 2.5, Proposed Resource-
 3 Specific Mitigations identified previously in Section 3.8.4, and those Resource-Specific
 4 Mitigations associated with earth resources (Section 3.6) and water quality (Section 3.7), the
 5 following additional Resource-Specific Mitigations have been identified that would further
 6 minimize impact potential or the severity of identified impacts; these are also included in the
 7 ESA Section 7 Consultation located in Appendix C:

- 8 • Identify designated boat landing areas for amphibious operations that occur in Gulf
 9 sturgeon and freshwater mussel critical habitat on the Ochlocknee River and in
 10 Apalachicola Bay, preferably with improved surfaces.
- 11 • The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has
 12 recommended the following conservation measure: avoidance of "Good" and "Poor"
 13 rated vehicle water crossings for training use in order to protect the better crossing
 14 sites and minimize further degradation of the sites in poor condition.

6.9 CULTURAL RESOURCES

6.9.1 Affected Environment

Twenty-six cultural resource studies were conducted between 1976 and 2012 in the 10 THSF training areas. Archaeological surveys have been conducted in many of the Training Areas (Figure 6-41). Many of these surveys, are either not up to current scientific standards or were more focused academic studies and are not comprehensive in nature (DHR, 2013). Appendix F, *Cultural Resources*, lists surveys conducted on THSF.

Within THSF, there are 35 archaeological sites ranging in age from twentieth century historic contexts to the Early Archaic period (7,500 B.C.). Of these 35 sites, 13 (37.14 percent) are prehistoric, 17 (48.58 percent) are historic, and 3 (8.57 percent) are multicomponent historic and prehistoric. Due to insufficient information, the cultural or temporal affiliation of two sites (5.71 percent) cannot be determined. Most of the 35 sites have not been evaluated by either the principal investigator or the SHPO as to NRHP eligibility (DHR, 2013). Appendix F, *Cultural Resources*, lists sites considered potentially eligible along with those that remain unevaluated.

One historic district, Camp Gordon Johnson (8FR00900), formerly occupied the eastern half of THSF. Starting in 1942, the U.S. Army bought or leased approximately 159,000 acres to establish an amphibious training base for World War II recruits. At its height, Camp Gordon Johnston was Florida's second largest military installation, both in size and troops. The camp spanned over 20 miles along the Gulf Coast between Carabelle and Alligator Point and included St. George and Dog Islands. Originally called Camp Carabelle, the site was officially renamed Camp Gordon Johnston in January 1943. By 1944, the camp was also being used to house German and Italian prisoners of war (Hathaway et al., 2000).

Soon after World War II ended in 1945, the camp was closed. Structural remains and foundations (both above and below ground) were identified in only 3 of 22 surveyed areas. Military-related artifacts, including a dog tag, glass sherds, and a variety of metal fragments, were recorded for a portion of the survey area. Other structural remains included radio tower footers and concrete and brick building foundations. This historic site was identified during background research and further examined during fieldwork (Hathaway et al., 2000). Evaluative testing is recommended to determine NRHP eligibility.

One historic cemetery has been identified in TA-3. The Thompson Cemetery (8FR00873) was a family cemetery established in 1813. It is currently no longer in use but is maintained by the state of Florida (DHR, 2013). To date, no historic structures, TCPs, or SSSs have been identified to date within THSF (DHR, 2013).

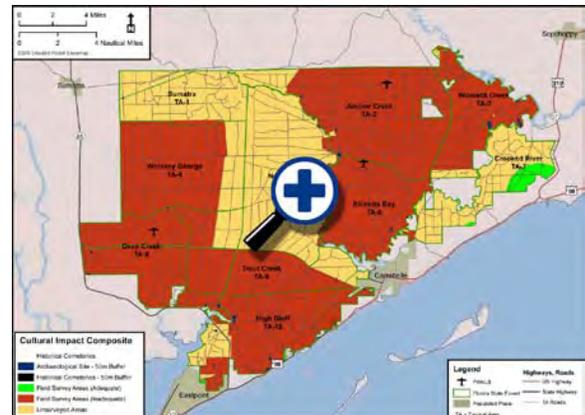


Figure 6-41. Cultural Resource Survey in THSF

6.9.2 Environmental Consequences

As discussed in Section 3.9, potential adverse impacts to cultural resources may occur from land disturbance activities, dismantled movement, and AO due to ground disturbance. Other Proposed Action effectors are not addressed in this section. Impacts to THSF cultural resources identified in Section 6.9.1 would be the same as those described in Section 3.9 and consist of potential disturbance or inadvertent discovery of previously unidentified cultural resources in both surveyed and unsurveyed areas. Ground disturbing activities would be limited in unsurveyed areas, and known cultural resource locations would be avoided as part of general operations constraints (see Section 2.5). The Air Force has notified the ACHP, Florida SHPO, and applicable Native American tribes about this Proposed Action. The Air Force is completing a Programmatic Agreement to meet its requirements under Section 106 of the NHPA. The final Programmatic Agreement and results of the consultation process will be included in Appendix C of the Final EIS.

6.9.3 Cultural Resources Impact Summary

Table 3-37 describes the context, intensity, and duration factors utilized in analysis for impacts to cultural resources. Based on the 36 CFR Section 800.5 definitions of "adverse effect" and "no effect," the Air Force has determined there is the potential for adverse effects to cultural resources. Implementation of the General Operational Constraints identified in Section 2.5 would minimize the potential for negative effects. In addition, units would have access to a database and maps that would provide spatial and textual information on restrictions associated with specific training areas. These tools would allow units quick access to information on avoidance areas, thus minimizing the potential for impacts to cultural resources.

Table 6-46 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- No effect (green)

Table 6-46. Cultural Resource Impacts Summary by TA at THSF

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).									

Table 6-46. Cultural Resource Impacts Summary by TA at THSF, Cont'd

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Dismounted movement	Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5.									
Use of Expendables	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).									
Aircraft Operations	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).									
Amphibious Operations	Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5.									
Utilities	The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9).									

1 **6.9.4 Proposed Resource-Specific Mitigations**

2 No additional Resource-Specific Mitigations for cultural resources have been identified. All
 3 General Operational Constraints (Section 2.5) identified previously would sufficiently
 4 minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect
 5 (green).

6 **6.10 LAND USE**

7 **6.10.1 Affected Environment**

8 Existing and planned land uses at THSF include
 9 rangeland, forested, urban/built up, and
 10 wetlands (FDEP, 2007b). [Figure 6-42](#) shows the
 11 various land use types, recreational areas,
 12 private parcels, and special use areas at THSF.
 13 [Table 6-47](#) lists the number, acreage, and
 14 percent of land use types, recreation areas,
 15 and privately held parcels present in each TA at
 16 THSF (TA-1 through TA-10). More detail
 17 regarding land use types and management
 18 practices at THSF can be found in the *Ten Year*
 19 *Management Plan for Tate's Hell State Forest*.

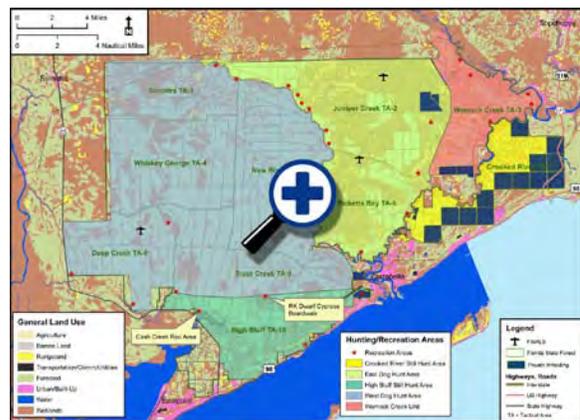


Figure 6-42. Generalized Land Use Types at THSF

1

Table 6-47. General Land Use Types Present in TAs at THSF

Tactical Area ¹ (TA)	Land Use Type						
	Barren Land	Rangeland	Transportation/ Communications/ Utilities	Forested	Urban/Built Up	Water	Wetlands
TA-1							
# Parcels	0	18	3	62	0	2	386
Acreage		281	70	7,551		11	6,916
% of TA		2	<1	51		<1	47
TA-2 (contains proposed FWALS)							
# Parcels	0	125	0	80	0	3	476
Acreage		176		8,193		69	21,314
% of TA		6		26		<1	68
TA-3							
# Parcels	0	31	6	182	5	2	187
Acreage		472	12	5,209	2	67	8,250
% of TA		3	<1	37	<1	<1	59
TA-4							
# Parcels	0	1	0	43	0	0	291
Acreage		8		18,917			5,860
% of TA		<1		76			24
TA-5							
# Parcels	0	1	0	43	0	5	289
Acreage		5		25,758		57	3,366
% of TA		<1		88		<1	12
TA-6 (contains proposed FWALS)							
# Parcels	0	73	0	184	1	1	346
Acreage		673		5,538	<1	35	10,619
% of TA		4		33	<1	<1	63
TA-7							
# Parcels	0	2	2	249	1	5	269
Acreage		12	<1	8,529	<1	24	4,771
% of TA		<1	<1	64	<1	<1	36
TA-8 (contains proposed FWALS)							
# Parcels	0	0	6	58	1	2	172
Acreage			22	13,539	<1	1	2,969
% of TA			<1	82	<1	<1	18
TA-9							
# Parcels	0	2	9	92	4	2	227
Acreage		1	26	16,686	4	4	431
% of TA		<1	<1	79	<1	<1	20
TA-10							
# Parcels	3	31	19	196	17	14	562
Acreage	7	411	82	13,835	7	105	8,453
% of TA	<1	2	<1	60	<1	<1	37

Source: FDEP, 2007b

FWALS = Fixed-Wing Aircraft Landing Sites; TA = tactical area; THSF = Tate's Hell State Forest

1. Percentages are approximate and rounded

1 **Recreational Opportunities**

2 The entire THSF is part of an approximately 2,000-acre WMA that provides opportunities for
 3 recreational activities, including horseback riding (where permitted), camping (where
 4 permitted), fishing, wildlife viewing, biking, picnicking, off-highway vehicle use, and
 5 canoeing. [Table 6-48](#) lists the recreational areas in each TA). See [Figure 6-42](#) for specific
 6 locations of recreational areas at THSF (FDACS, 2004b).

7

Table 6-48. Recreational Areas Present in Each TA at THSF

Tactical Area (TA)	Major Recreational Areas and Features (associated uses)
TA-1	Primitive camp sites
TA-2	Primitive camp sites Off-highway vehicle access Picnic area Boat launch
TA-3	Primitive camp sites Boat launch area Picnic area
TA-4	None
TA-5	Primitive camp sites
TA-6	Primitive camp sites
TA-7	Primitive camp site Boat launch Picnic area
TA-8	Primitive camp site Picnic area
TA-9	Primitive camp sites
TA-10	Wildlife viewing area Hiking Ralph Kendrick Dwarf Cypress Boardwalk Cash Creek Recreation Area Picnic area Boat launch

Source: (FDACS, 2004b).

TA = tactical area; THSF = Tate's Hell State Forest

8 **Private and Adjacent Landowners**

9 Several private inholdings are surrounded by, or adjacent to, the TAs at THSF. Private parcels
 10 include private land owners, commercial businesses, and housing for on-site staff.
 11 [Figure 6-42](#) shows the locations for the major private parcels at THSF. [Table 6-49](#) lists the
 12 number and acreage of private parcels associated with each TA.

1

Table 6-49. Private Parcels Present at THSF

Tactical Area (TA)	Name	Private Inholdings (Within Overall THSF Perimeter)		# Private Holdings Adjacent to THSF/TA Perimeter
		Quantity	Acreage	
1	Sumatra	0		9
2	Juniper Creek	2	116	14
3	Womack Creek	4	620	5
4	Whiskey George	0		6
5	New River			0
6	Picketts Bay			
7	Crooked River	14	5810	22
8	Deep Creek	0		18
9	Trout Creek	3	216	18
10	High Bluff	2	225	123

Source: FDEP, 2007b

TA = tactical area; THSF = Tate's Hell State Forest

2 **6.10.2 Environmental Consequences**3 **6.10.3 Land Use Impact Summary**

4 [Table 3-41](#) describes the context, intensity, and duration factors utilized in analysis for
5 impacts to land use; based on these factors the Air Force has identified insignificant adverse
6 impacts to public health and safety and the human and natural environment. Temporary
7 annoyance to transient recreational users from noise during training activities (see Noise
8 Sections [3.3](#) and [6.3](#)) is unavoidable. Impacts to other recreational users and adjacent
9 landowners would be minimized through implementation of operational constraints
10 identified in Section [2.5](#), and avoidance of noise-sensitive areas (see [Figure 6-12](#) through
11 [Figure 6-22](#)). Minor, short-term, small-scale closures of areas (HLZs/DZs, road segments)
12 during training activities would not preclude use of the forest, and access would be allowed
13 once training activities have ceased. No conflicts with hunters have been identified, since
14 day-time training activities would be restricted during hunting season. While the impacts are
15 adverse, the quality of the recreational experience may be somewhat diminished by these
16 impacts, but this would not preclude recreational use or cause general incompatibility, and
17 impacts would be short term.

18 [Table 6-50](#) summarizes the impacts identified. Impacts are categorized as follows:

- 19 • Adverse (yellow)
- 20 • Neutral/no effect (green)

Table 6-50. Land Use Impacts Summary by TA at THSF

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse impacts to land use associated with these activities (see Section 3.10).									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to land use associated with these activities (see Section 3.10).									
Dismounted movement										
Use of Expendables										
Blanks/GBS	Noise-generating expendables would be restricted near noise-sensitive locations (see Figure 6-12 through Figure 6-22). Measures would be taken to minimize noise impacts, but occasional low-level temporary noise impacts to recreational users and adjacent landowners could occur.									
Smoke grenades										
Other/equipment										
Aircraft Operations	Although measures such as restrictions regarding the timing and location of aircraft operations (see Figure 6-12 through Figure 6-22) would minimize noise impacts to recreational users and adjacent landowners, occasional low-level temporary noise impacts could occur.									
Amphibious Operations	The Air Force has not identified any adverse impacts to land use associated with these activities (see Section 3.10).									

6.10.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for land use have been identified. All General Operational Constraints (Section [2.5](#)) identified previously, as well as Proposed Resource-Specific Mitigations identified for noise (Section [3.3.4](#)) would sufficiently minimize any identified adverse impacts.

6.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

6.11.1 Affected Environment

The main concerns regarding socioeconomic and environmental justice resources include noise, safety, and disturbance associated with the military land and air training that could potentially impact recreation and tourism and environmental justice-related populations. Socioeconomic resources associated with THSF are concentrated in Liberty County and Franklin County, Florida, which constitutes the ROI for the analysis.

There are several privately owned parcels and state-owned parcels dispersed throughout THSF. The majority of the private properties are located on the southern end of the forest between Eastpoint and Carrabelle and are being developed for residential and vacation homes (FDACS, 2007). There are two adjacent parcels located on the eastern side of the forest for the purpose of mining operations. There are no residents permanently stationed on federal property, but on-site housing at THSF could be considered and established if approved by the Director.

Recreation and Tourism

There are many outdoor recreational opportunities within THSF that depend on the natural environment (FDACS, 2007). The number of recreational opportunities available has increased dramatically over the past several years. THSF is located in Tate’s Hell WMA and has 35 miles of rivers, streams, and creeks available for activities including canoeing, boating, fishing, camping, and hunting.

As of 2007, there were 268 miles of primary and secondary roads and 850 miles of nonpaved roads. This extensive network of paved roads has increased public access to the area, which is now a popular location for residents to hunt and fish (FDACS, 2007). There are over 35 points where recreational users can access THSF, which is open year-round to fishing in the rivers and ditches and during the established seasons for hunting (FDACS, 2007). More information regarding recreational use is provided in Land Use Sections 3.10 and 6.10.

Environmental Justice

Table 6-51 lists the percentage of minority, low-income, and youth populations compared with the COC populations. The COC values represent the percentages of minority and low-income populations within a geographic extent representing the ROI. Locations where the countywide percentages, or AOC percentages, are greater than the statewide percentages, or COC percentages, are identified as having potential EJ concerns. As indicated in Table 6-51 and Figure 6-43, the individual counties and the two-county ROI have a lower percent of minority and youth populations than the state and the nation but a higher percent of low-income populations than the state and the nation. Noise-sensitive locations, such as schools and childcare centers, are not located on THSF; however, there are many recreational sites located throughout the forest that could be considered noise-sensitive locations. Schools and childcare centers are also shown in Figure 6-43.

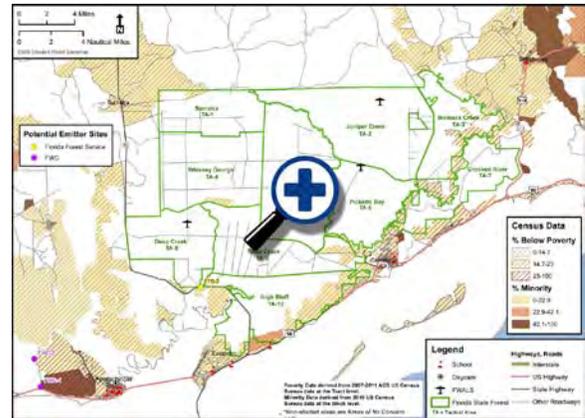


Figure 6-43. Environmental Justice Areas of Concern Near THSF

Table 6-51. Total Populations and Populations of Concern, 2010

Region	Total Population	Minority (%)	Low-Income ¹ (%)	Youth (%)
Franklin County	11,549	20.4%	24.0%	17.1%
Liberty County	8,365	26.4%	21.4%	21.2%
Two-County ROI	19,914	22.9%	22.9%	18.8%
Florida	18,801,310	42.1%	14.7%	21.3%
United States	308,745,538	36.3%	14.3%	24.0%

Source: U.S. Census Bureau 2010, 2013

Source: U.S. Census Bureau 2010, 2013

ROI = region of influence

*1. American Community Survey, 5 year estimate, 2007–2011

6.11.2 Environmental Consequences

As discussed in Section 3.11, potential adverse impacts to socioeconomic resources may occur from safety issues associated with wildfire and land use incompatibility associated with noise resulting from UoEX and aircraft operations. Other proposed action effectors are not addressed in this section. Impacts to THSF socioeconomic and environmental justice resources identified in Section 6.11.1 would be the same as those described in Section 3.11.

Recreation and Tourism

As described in Section 2.5, scheduling for training activities would constrain the time, frequency, and types of activities to avoid conflicts with hunters, campers, boaters, and other recreational users. Some transient recreational users, such as hikers, may be annoyed by noise from aircraft operations.

Environmental Justice and Special Risks to Children

As described previously, no other impacts for this action have been identified that would impact environmental justice or pose special risks to children.

6.11.3 Socioeconomics/Environmental Justice Impact Summary

Socioeconomic and environmental justice impacts are tied to those related to noise (Sections 3.3 and 6.3), safety (Sections 3.4 and 6.4) and land use (Sections 3.10 and 6.10). Table 3-44 describes the context, intensity, and duration factors utilized in analysis for impacts to socioeconomics and environmental justice; based on these factors the Air Force has identified insignificant socioeconomic or environmental justice impacts to public health and safety and the human environment.

Table 6-52 provides a summary of the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

Table 6-52. Socioeconomic/Environmental Justice Impacts Summary – THSF

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section 3.11).									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section 3.11).									
Dismounted movement										
Use of Expendables										
Blanks/GBS	Potential adverse impacts to the public associated with increased wildfire potential and noise. Impacts									

Table 6-52. Socioeconomic/Environmental Justice Impacts Summary – THSF, Cont'd

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Smoke grenades Other/equipment	would be mitigated through implementation of General Operational Constraints identified in Section 2.5, as well as Proposed Resource-Specific Mitigations described in Sections 3.3/6.3 (Noise) and Sections 3.4/6.4 (Safety). Such mitigations include avoidance of noise-sensitive areas and adherence to wildfire management requirements.									
Aircraft Operations	Potential adverse impacts to the public associated with noise from aircraft operations (see Sections 3.3/6.3 [Noise]. Impacts would be mitigated through operational constraints described in Section 2.5 and Proposed Resource-Specific Mitigations described in Section 6.3 [Noise]), such as use of avoidance areas and other flight constraints.									
Amphibious Operations	The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section 3.11).									

1 **6.11.4 Proposed Resource-Specific Mitigations**

2 No additional Resource-Specific Mitigations for socioeconomics and environmental justice
3 have been identified as a result of analyses in this chapter. All General Operational
4 Constraints (Section 2.5) identified previously, as well as Proposed Resource-Specific
5 Mitigations identified for noise (Section 3.3.4), would sufficiently minimize any identified
6 adverse impacts.

7 **6.12 SOLID AND HAZARDOUS MATERIALS/WASTE**

8 **6.12.1 Affected Environment**

9 No hazardous materials or hazardous or petroleum wastes would be generated at most THSF
10 sites, because no industrial activities would occur at these sites. At administrative locations,
11 personnel would perform limited maintenance of vehicles and equipment, primarily
12 consisting of oil and fluid changes. Consequently, hazardous materials stored at these sites
13 include small quantities (55-gallon containers or smaller) of lubricating oil, hydraulic fluid,
14 antifreeze, solvents, and paints. Wastes generated would include waste and solvents. All
15 materials and wastes would be managed according to established FFS requirements. These
16 requirements include the use of secondary containment and the availability of spill response
17 equipment.

18 Additionally, the affected environment would comprise FFS requirements regarding the use
19 and management of hazardous materials and wastes.

20 **6.12.2 Environmental Consequences**

21 As discussed in Section 3.12, Solid and Hazardous Materials/Waste, no adverse impacts to
22 public health and safety or the human and natural environment associated with solid and
23 hazardous material or waste would occur from training activities, and all activities would
24 comply with federal, state, and local regulations. As a result, this resource area is not
25 discussed further in this chapter.

6.13 INFRASTRUCTURE AND TRANSPORTATION

6.13.1 Affected Environment

Based on the limited interaction between training activities and utilities and transportation resources, discussion of the affected environment for infrastructure at THSF is general in nature.

Utilities

Utilities within THSF are extremely limited. Utilities are present at the THSF Headquarters; the Womack Creek Group Recreation Area has a bathhouse. Also, NFWFMD operates four deep water table monitoring wells: two in the Juniper Creek Tract (TA-2) and two in the Womack Creek Tract (TA-3) (THSF, 2007).

Transportation

The local and regional road network between Eglin AFB/Hurlburt Field and THSF is well developed. Public access to THSF is via paved roads, including County Road 67, SR 65, and US 98. THSF can also be accessed from the north through the Apalachicola National Forest. THSF has over 850 miles of nonpaved roads, of which 268 miles are classified as primary and secondary roads. All of the recreation areas can be accessed via these primary and secondary roads (THSF, 2007).

6.13.2 Environmental Consequences

As discussed in Section 3.13.2, no adverse impacts to public health and safety and the human and natural environment associated with use of utilities or transportation resources would occur from training activities. All activities would comply with federal, state, and local regulations. As a result, this resource area is not discussed further in this chapter.

6.14 TATE'S HELL STATE FOREST IMPACT SUMMARY

Table 6-53 provides a summary of impact determinations associated with training activities, for potentially affected resources based on analyses presented in Chapter 3, Sections 3.2 through 3.13, and Chapter 6, Sections 6.2 through 6.13. A "dot" in a cell indicates an interaction between the training activity and the respective resource. Impacts are categorized as follows:

- Adverse (yellow) – Potential impact to public health and safety, the human and natural environment, and/or potential violation of federal, state, or local regulations
- Neutral/no effect (green)

Adverse, insignificant impacts have been identified and are described in detail in the respective resource area chapters.

The analyses in these sections were conducted based on effectors associated with training activities (as identified in Table 3-1 and their impacts on receptors identified in Table 3-2. The impact summary provided in Table 6-53 ties these two tables together and identifies the

1 degree of impact to affected resources associated with specific training activities as described
 2 in Section 2.3.2. This allows the reader to understand the potential impacts associated with
 3 specific training activities.

4 Proposed Resource-Specific Mitigations applicable to both BRSF and THSF resulting from
 5 general analysis were previously identified in Section 3.14.1. Additional Proposed Resource-
 6 Specific Mitigations identified through analysis in this chapter are provided in Section 6.14.1
 7 that would serve to further minimize or avoid any identified adverse impacts.

8

Table 6-53. THSF Impact Summary

Proposed Action Component	Resource Area Potentially Affected											
	Airspace (3.2/5.2)	Noise (3.3/5.3)	Safety (3.4/5.4)	Air Quality (3.5/5.5)	Earth Resources (3.6/5.6)	Water Resources (3.7/5.7)	Biological Resources (3.8/5.8)	Cultural Resources (3.9/5.9)	Land Use (3.10/5.10)	Socioeconomics/ Environmental Justice (3.11/5.11)	Haz/Solid Materials & Waste (3.12/5.12)	Infrastructure (3.13/5.13)
HLZs/DZs		•	•	•	•	•	•	•	•	•	•	•
FWALS		•	•	•	•	•	•	•	•	•	•	•
Use of Expendables		•	•	•	•	•	•	•	•	•	•	•
Light Aviation Proficiency Training	•	•	•	•	•	•	•	•	•	•	•	•
LLHI/E	•	•	•	•	•	•	•	•	•	•	•	•
Temporary Combat Support Areas					•	•	•	•			•	
Airdrops	•	•	•	•	•		•	•	•	•	•	
Air/Land Vertical Lift	•	•	•	•	•		•	•	•	•	•	
FARP/HGO						•					•	
Cross Country Dismounted Movements					•	•	•	•	•	•	•	
Cross Country Vehicle Movement		•	•	•	•	•	•	•	•	•	•	•
Vehicle Stream and Wetland Crossing		•	•	•	•	•	•	•	•	•	•	•
Blackout Driving		•	•	•	•	•	•	•	•	•	•	•
Emplacement of Obstacles					•		•	•	•		•	
Bivouacking/ Assembly Areas				•	•		•	•	•		•	
Communications and Surveillance Operations				•	•		•	•	•		•	
Amphibious Operations		•	•	•	•	•	•	•	•	•	•	

Table 6-53. THSF Impact Summary, Cont'd

Proposed Action Component	Resource Area Potentially Affected											
	Airspace (3.2/5.2)	Noise (3.3/5.3)	Safety (3.4/5.4)	Air Quality (3.5/5.5)	Earth Resources (3.6/5.6)	Water Resources (3.7/5.7)	Biological Resources (3.8/5.8)	Cultural Resources (3.9/5.9)	Land Use (3.10/5.10)	Socioeconomics/Environmental Justice (3.11/5.11)	Haz/Solid Materials & Waste (3.12/5.12)	Infrastructure (3.13/5.13)
Natural Resource Consumption					•	•	•				•	
Overwater Hoist Operations	•	•	•	•		•	•		•	•	•	
Opposing Forces Vehicle Operations	•	•	•	•	•		•	•	•	•	•	
Hardened Camp Site Use											•	•

DZ = drop zone; FARP/HGO = Forward Air Refueling Point/Hot Gas Operations; FWALS = Fixed-Wing Aircraft Landing Sites; HLZ = helicopter landing zone; LLHI/E = Low-Level Helicopter Insertions/Extractions

1 **6.14.1 THSF Proposed Resource-Specific Mitigations**

2 Based on the scope of activities associated with the Proposed Action, the inherent General
 3 Operational Constraints identified in Section 2.5, and related impact analyses detailed in this
 4 EIS, the following Proposed Resource-Specific Mitigations have been identified to further
 5 minimize or avoid adverse impacts—in most cases impacts would be minimized such that
 6 impact levels would be reduced from “adverse” (yellow) to “neutral” or “no effect” (green).

7 **Noise**

8 Noise generating expendables would not be used within 4,000 feet of noise-sensitive
 9 locations. Figure 6-12 through Figure 6-22 show the areas in which training activities would
 10 be restricted based on buffer distances described above and in Section 3.3.4. Buffers are
 11 established from all privately-owned parcels containing at least one residential structure and
 12 all campgrounds.

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7. CUMULATIVE IMPACTS

According to CEQ regulations, cumulative effects analysis in an EIS should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7).

7.1 CUMULATIVE IMPACT ANALYSES PRINCIPLES

Cumulative effects may occur when there is a relationship between a proposed action or alternative and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. The effects may then be incremental (increasing) in nature and result in cumulative impacts. Actions overlapping with or in proximity to the proposed action or alternatives can reasonably be expected to have more potential for cumulative effects on “shared resources” than actions that may be geographically separated. Similarly, actions that coincide temporally will tend to offer a higher potential for cumulative effects.

In this EIS, the Air Force has made an effort to identify actions on or near the action areas associated with the Proposed Action that are under consideration and in the planning stage at this time. These actions are included in the cumulative analysis sections to the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action and associated resources. Although the level of detail available for those future actions varies, this approach provides the decision maker with the most current information to evaluate the consequences of the alternatives. The EIS addresses cumulative impacts in order to assess the incremental contribution of the alternatives to impacts on affected resources from all factors.

Given the global and cumulative nature of climate change associated with GHGs, cumulative impacts associated with GHGs are addressed below. Draft CEQ guidance on climate change and NEPA require analysis of “[t]he relationship of climate change effects to a proposed action or alternatives, including the relationship to proposal design, environmental impacts, mitigation and adaptation measures.”

GHGs are gases that trap heat in the atmosphere. The accumulation of GHGs in the atmosphere regulates the earth’s temperature. GHG emissions are generated by both natural processes and human activities. GHGs include water vapor, CO₂, CH₄, N₂O, ozone, and several hydrocarbons and chlorofluorocarbons (CFCs). Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth’s surface. The GWP of a particular gas provides a relative basis for calculating its CO₂e, or the amount of CO₂ that would be equal to CO₂, which has a GWP of 1 and is, therefore, the standard by which all other GHGs are measured. The U.S. Global Change Research Program report *Global Climate Change Impacts in the United States* states the following:

Observations show that warming of the climate is unequivocal. The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases.

1 These emissions come mainly from the burning of fossil fuels (coal, oil, and gas), with
2 important contributions from the clearing of forests, agricultural practices, and other
3 activities. Warming over this century is projected to be considerably greater than over the
4 last century. The global average temperature since 1900 has risen by about 1.5 degrees
5 Fahrenheit (°F). By 2100, it is projected to rise another 2 degrees to 11.5°F. The U.S. average
6 temperature has risen by a comparable amount and is very likely to rise more than the global
7 average over this century, with some variation from place to place.

8 Several factors will determine future temperature increases. Increases at the lower end of this
9 range are more likely if global heat-trapping gas emissions are cut substantially. If emissions
10 continue to rise at or near current rates, temperature increases are more likely to be near the
11 upper end of the range. Volcanic eruptions or other natural variations could temporarily
12 counteract some of the human-induced warming, slowing the rise in global temperature, but
13 these effects would only last a few years. Reducing emissions of CO₂ would lessen warming
14 over this century and beyond. Sizable early cuts in emissions would significantly reduce the
15 pace and the overall amount of climate change. Earlier cuts in emissions would have a greater
16 effect in reducing climate change than comparable reductions made later. In addition,
17 reducing emissions of some shorter-lived heat-trapping gases, such as CH₄, and some types of
18 particles, such as soot, would begin to reduce warming within weeks to decades. Climate-
19 related changes have already been observed globally and in the United States. These include
20 increases in air and water temperatures, reduced frost days, increased frequency and intensity
21 of heavy downpours, a rise in sea level, and reduced snow cover, glaciers, permafrost, and sea
22 ice. A longer ice-free period on lakes and rivers, lengthening of the growing season, and
23 increased water vapor in the atmosphere have also been observed. Over the past 30 years,
24 temperatures have risen faster in winter than in any other season, with average winter
25 temperatures in the midwest and northern Great Plains increasing more than 7°F. Some of
26 the changes have been faster than previous assessments had suggested.

27 These climate-related changes are expected to continue while new ones develop. Likely
28 future changes for the United States and surrounding coastal waters include more intense
29 hurricanes with related increases in wind, rain, and storm surges (but not necessarily an
30 increase in the number of these storms that make landfall), as well as drier conditions in the
31 southwest and Caribbean. These changes will affect human health, water supply, agriculture,
32 coastal areas, and many other aspects of society and the natural environment (Karl et al.,
33 2009). While regional and state impacts are more difficult to predict than large regional or
34 global impacts, a report by the Florida Governor's Action Team on Energy and Climate
35 Change (2012) says that regional models indicate the following possible impacts in the state
36 of Florida:

- 37 • Sea level rise could lead to flooding of low-lying areas, erosion of beaches, loss of
38 coastal wetlands, intrusion of saltwater into water supplies, and increased vulnerability
39 of coastal areas to storms and hurricanes.
- 40 • As climate changes, this could cause some plants and animals to go extinct, some to
41 decline or increase in population, and others migrate to areas with more favorable
42 conditions. For example, along the coast, fish that need colder temperatures to survive
43 could migrate north, while more tropical varieties could move up the coast into
44 Florida.

- 1 • Diseases and pests with current tropical ranges could invade Florida, as have West Nile
2 virus and Africanized honey bees in Florida's panhandle.
- 3 • Crops and trees that need cooler climates may not grow as well in Florida, while more
4 tropical varieties might do better.
- 5 • More severe storms and droughts could affect crop production, pests, and growth
6 rates.

7 While the Proposed Action would result in GHG emissions, based on the analysis presented in
8 Chapters 3, 4, 5, and 6, the Air Force has identified only minor GHG emission increases over
9 the baseline condition. Emissions would be associated with extra travel time/distance
10 resulting from transport to and from each state forest as opposed to remaining on Eglin AFB.
11 In all other respects, GHG emissions would be similar to the baseline condition from a
12 regional and global context. Therefore, the Air Force expects the Proposed Action to have
13 negligible cumulative impacts to GHG production and climate change when taken into
14 context with other factors affecting climate change.

15 At this time, analysis of whether global warming or climate change will have an effect on the
16 Proposed Action is purely speculative due to the uncertainties and vagaries of the available
17 science and timelines for potential climate change impacts. Were the impacts associated with
18 climate change to occur as outlined previously there would certainly be an effect on the
19 Proposed Action, as well as impacts to human-related activities as a whole. Any proposal
20 design, mitigation and/or adaptation measures to minimize the effects of climate change on
21 the Proposed Action would be developed as climate change effects are more fully realized,
22 and would likely be part of an overall strategy by the Air Force to adapt to climate change
23 impacts.

24 7.2 CUMULATIVE IMPACT ASSESSMENT METHODOLOGY

25 No unmitigatable adverse impacts have been identified for use of emitters sites, thus the Air
26 Force has not identified any correlating potential for cumulative impacts from emitter site
27 use.

28 Cumulative analysis therefore focuses on the potential for cumulative impacts associated
29 with the Proposed Action and each state forest region, as well as northwest Florida as a
30 whole. Analysis is conducted by first identifying past, present, and reasonably foreseeable
31 actions as related to the ROI for the particular resource. Cumulative impacts are then
32 identified if the combination of proposed activities and past, present, and reasonably
33 foreseeable actions interact with the resource to the degree that incremental or additive
34 effects occur. In the absence of any adverse impacts identified for solid/hazardous waste and
35 infrastructure/transportation, no cumulative impacts have been identified and these issue
36 areas are not discussed further.

1 **7.3 BLACKWATER RIVER STATE FOREST CUMULATIVE IMPACT ASSESSMENT**

2 **7.3.1 BRSF Regional Past/Present/Reasonably Foreseeable Future Actions**

3 Actions potentially interacting with resources impacted by the Proposed Action are limited to
4 activities associated with BRSF, since the affected resources related to the Proposed Action
5 are those within BRSF and along its borders. The main action for consideration under
6 cumulative impacts for BRSF is FFS implementation of the BRSF Forest Management Plan; this
7 plan details specific forest management goals, objectives, and projects that would be
8 implemented over the specified planning period.

9 Multi-use strategies to utilize and conserve state forest resources include:

- 10 • Support state forest management objectives and sustain efficient sources of revenue
11 through the implementation of sustainable forest management practices.
- 12 • Provide resource-based outdoor recreational opportunities for multiple interests.
- 13 • Restore and manage healthy forests and native ecosystems and ensure the viability of
14 listed plants and animals.
- 15 • Protect archaeological, historical, cultural, and paleontological resources.
- 16 • Restore, maintain, and protect hydrologic functions of water resources and health of
17 aquatic communities.
- 18 • Cooperate with the military to facilitate mission-essential training in a manner that
19 does not adversely impact natural resources, forest management, or public access
20 (FDACS, 2013).

21 Overall, the FFS implementation of the management plan would serve to conserve and
22 enhance the natural environment of BRSF, and improve recreational opportunities at BRSF;
23 this would not be expected to result in adverse impacts to BRSF resources.

24 Additionally, the Proposed Action would be required to comply with applicable FFS forest
25 management plan requirements, thus ensuring no management conflicts between the
26 Proposed Action and the FFS management program.

27 The FFS is actively involved with ongoing and proposed projects to control erosion and
28 sedimentation in surface waters and wetlands at BRSF. These projects include efforts to
29 restore highly eroded areas (with various state and federal agencies), monitoring
30 groundwater quality and quantity (with NFWFMD), and ongoing road and trail evaluations.
31 Ongoing and future projects include closing unneeded roads, surfacing other roads, installing
32 rock at low-water stream crossings, restricting vehicle access to the more sensitive primitive
33 recreation sites, restricting access to some primitive recreation sites that are closed
34 permanently or seasonally, and reengineering and revegetating problem areas to abate
35 erosion at road-stream crossings and borrow pits.

36 To assess potential regional cumulative impacts, the comprehensive plans for Okaloosa
37 (Okaloosa County, 2009) and Santa Rosa (Santa Rosa County, 2008) Counties were reviewed.
38 The road departments for each county provide ongoing operational maintenance for BRSF
39 roads within their jurisdiction. It is anticipated that impacts from commercial logging

1 activities outside the forest, but within the affected county areas, would be similar to those for
2 BRSF. Both counties maintain active boat launching facilities along major streams.

3 The other action with potential cumulative impacts at BRSF is the beddown of the F-35 at
4 Eglin AFB currently being evaluated in another NEPA document (U.S. Air Force, 2013b).

5 **7.3.2 Cumulative Impacts by Resource Area**

6 **Airspace**

7 The beddown of 59 F-35s at Eglin AFB currently under way will increase the number of sorties
8 flown in the Eglin MOAs and R-2915 (U.S. Air Force, 2008). At BRSF, a majority of GLI training
9 operations would be conducted at altitudes below the floor altitudes of the Eglin MOAs.
10 Proposed GLI training would have minimal cumulative effects in combination with increased
11 F-35 flight activity since they occur in different airspace.

12 Airspace in the region is currently somewhat congested, and demand for airspace is expected
13 to increase. The Strategic Plan developed as part of the GRASI includes several recommended
14 strategies that would improve ATC procedures, enhance military capacity, and enhance
15 collaboration among airspace users in the region. These strategies include, but are not
16 limited, to reorganization of the Pensacola North MOA and increased coordination between
17 airspace managing agencies. If these strategies are adopted, they would reduce the potential
18 effects that continued growth in demand for available airspace would have on regional traffic
19 flow and the efficiency of operations. Proposed GLI training would not typically require use of
20 SUA or extensive ATC management. GLI training would allow nonhazardous training
21 currently conducted in R-2915 to be conducted elsewhere, partially alleviating scheduling
22 concerns in a critical airspace unit. Cumulative impacts at a regional level would be minimal
23 and include beneficial impacts.

24 **Noise**

25 Operational scenarios including F-35 utilization of training airspace continue to evolve.
26 However, as of May 2013, it was anticipated that noise levels beneath R-2915A and Eglin A
27 MOA would not exceed 62 dB DNL_{mr} once F-35 units are at full strength. F-35 aircraft are not
28 expected to use Eglin B MOA frequently, and noise levels beneath the MOA would remain
29 below 45 dB DNL_{mr} (Air Force 2013). F-35 individual overflight noise levels are substantially
30 higher than noise levels generated by aircraft during GLI training (see [Table 5-5](#)). In most
31 portions of BRSF beneath Eglin A MOA and R-2915A, noise generated by GLI training would
32 not add appreciably to overall time-averaged noise levels generated by the F-35 and other
33 aircraft. Additional annoyance could result from experiencing F-35 training noise as well as
34 proposed GLI training noise, particularly in the immediate vicinity of designated GLI training
35 locations.

36 **Safety**

37 From a regional perspective, training activities that currently occur on adjacent Eglin AFB
38 would occasionally occur at BRSF and would not necessarily result in an incremental impact
39 to safety within the region. While there would not be an overall increase in the number of
40 potential aircraft mishaps (because the overall number of aircraft operations would not
41 change), BRSF-related areas could see an increase in location-specific occurrences during
42 training activities, due to the shift of operations to the area, while there would be less

1 probability of mishaps at Eglin AFB. Similarly, with wildfires the overall potential for wildfires
2 would shift from Eglin AFB to BRSF during training activities, but the overall number of
3 wildfires occurring in the BRSF region is not likely to increase or decrease in any substantive
4 manner. The probability of occurrence based on drought conditions, wildfire fuel load, and
5 the number of potential fire-starting activities would generally remain the same.
6 Implementation of wildfire prevention requirements as identified in Section 3.4 would
7 minimize potential wildfire occurrences. While there are potential safety concerns inherent to
8 training activities, these would be mitigated through implementation of SOPs and other
9 constraints identified in Section 3.4, thus minimizing the potential for cumulative impacts
10 within the BRSF region.

11 **Air Quality**

12 Any training activities would be consistent with the restoration and maintenance plans for
13 the state forests. Each plan outlines the resource protection measures designed to reduce
14 impacts for future use. Because the Air Force is already conducting activities in the ROI, the
15 increase in emissions due to training activities would be a small percentage of the overall
16 emissions in the region and mainly associated with the extra travel distance from Eglin AFB to
17 BRSF. As a result, negligible cumulative impacts to air quality are expected.

18 **Earth Resources**

19 Analysis focuses on activities where there is a discernible potential for the Proposed Action to
20 affect the nature of earth resource impacts and effects at the regional (Okaloosa and Santa
21 Rosa Counties) scale.

22 Contributing mounted troop movements and other training related vehicle-based support
23 activities could increase the utilization of some roads and crossings maintained by Okaloosa
24 and Santa Rosa Counties. It is anticipated that potential incremental soil erosion and
25 sedimentation cumulative effects of military vehicles would not diminish the life cycle of
26 county road and crossing improvements and would be insignificant. Proposed Action
27 training constraints and mitigations to avoid and amend mission-related roadscape damage
28 would benefit affected sites.

29 Contributing aircraft HLZ/DZ landings and dismounted troop movements could damage
30 post-harvest clearcut earth resources but would not impact county commercial logging
31 operations and incrementally increase stream sedimentation rates. Constraints and
32 mitigations to avoid and amend mission-related damage would benefit affected sites and
33 minimize soil erosion and sedimentation. It is anticipated that potential earth resource
34 impacts would be insignificant. Mission activities would not occur at county-maintained boat
35 launches or other recreational sites outside BRSF. As applicable, the military would
36 coordinate directly with the FFS to ensure consideration of county planning objectives
37 related to transportation and conservation.

38 **Water Resources**

39 The cumulative impacts on water resources should take into account all surface-altering
40 actions that have occurred or are likely to occur within or adjacent to the ROI. The most
41 frequent effect of surface disturbance in this region is accelerated erosion and sediment
42 deposition which may affect water resources by contributing sediment, introducing
43 contaminants, or increased flooding. The primary cumulative impacts on surface water and

1 wetlands would result from any increase in the acreage of earthmoving activities and
2 accelerated erosion from roads and trails that have the potential to increase sediment
3 delivery and surface water runoff downstream or introduction of chemical contaminants into
4 surface waterbodies and wetlands.

5 All proposed training activities at BRSF would be consistent with the forest management
6 plans and policies for the forest and hydrologic restoration plans for BRSF. Proposed Air Force
7 training activities would comply with all federal, state, or local regulations. In addition, Air
8 Force environmental management regulations and policy contained in EAFBI 13-212, *Range
9 Planning and Operations*, and the *Interstitial Area Range Final Environmental Assessment
10 Revision 2* (U.S. Air Force, 2013c) identify specific measures to prevent potential adverse
11 effects to water resources from proposed training activities. These measures include, but are
12 not limited to, restricting vehicle access to existing roads, trails, and approved
13 stream/wetland crossings; establishing protective buffers around streams and wetlands; use
14 of BMPs to prevent soil erosion and sedimentation in streams and wetlands; and use of spill
15 prevention measures to prevent contamination in surface waters, aquifers, or wetlands from
16 fuel spills.

17 Impacts to water resources from the proposed training activities would be minimized as long
18 as troops adhere to all environmental management requirements and proposed mitigative
19 measures. Therefore, the Air Force does not expect any of the proposed training activities to
20 incrementally contribute to other impacts to water resources at BRSF.

21 **Biological Resources**

22 As discussed in Section [5.8.2](#), there would be some adverse but not significant impacts on
23 biological resources under the Proposed Action. However, no additional cumulative impacts
24 have been identified that would adversely impact biological resources. BRSF is a multi-use
25 state forest that utilizes and conserves state forest resources that will best serve the people of
26 the state of Florida while maintaining the purpose for which BRSF was acquired. Additional
27 potential for wildfires and ongoing recreational activities would have adverse cumulative
28 impacts on the forest. However, cumulative contributions would be insignificant due to
29 forest management practices. The FFS goal is to restore and manage healthy forests and
30 native ecosystems to ensure the long-term viability of biological resources, including all
31 wildlife and protected species and habitat communities. Additionally, the FFS would
32 continually cooperate with the U.S. military to facilitate mission-essential training in a manner
33 that does not adversely impact natural resources, forest management, or public access. The
34 *Ten-Year Resource Management Plan for BRSF* (FDACS, 2013), in coordination with Santa Rosa
35 and Okaloosa County Comprehensive Plans, only contribute beneficial cumulative impacts on
36 biological resources.

37 **Cultural Resources**

38 Damage to the nature, integrity, and spatial context of cultural resources can have a
39 cumulative impact if the initial act is compounded by other similar losses or impacts. The
40 alteration or demolition of historic structures or the disturbance or removal of cultural
41 artifacts may incrementally impact the cultural and historic setting of BRSF.

42 Recreational activities and forestry management practices at BRSF have long occurred in the
43 training areas under consideration for the Proposed Action. The inclusion of additional
44 training activities such as those that currently occur on Eglin AFB, if unrestrained, could

1 cumulatively impact various resources. These activities, which involve cross-country ground
2 movement and other potentially ground-disturbing activities, are guided by previously
3 mentioned operating instructions, such as EAFBI 13-212, as well as numerous other agreed-
4 upon stipulations resulting from other actions. These operating instructions, as discussed in
5 Section [3.9.4](#), would be implemented at BRSF as well. Thus, given the required coordination
6 with BRSF staff and 96 CEG/CEIEA Cultural Resources Office, required mitigations and BMPs, as
7 well as any measures recommended by the SHPO, mission activities are not expected to
8 contribute to cumulative impacts to archaeological resources.

9 **Land Use**

10 When combined with past, present, or reasonably foreseeable actions, no cumulative impacts
11 to land use receptors are anticipated, since the impacts at BRSF would not carry any
12 significant long-term adverse impacts. While other actions in the region, such as the
13 proposed F-35 beddown may impact land use, the Proposed Action would not result in any
14 incompatibilities with existing land use guidance or documents (see [Table 3-40](#)). In addition,
15 impacts to recreational users and landowners would be minimized or eliminated by following
16 impact avoidance measures as discussed in the land use baseline and impacts section as well
17 as those described in the mitigation sections of this EIS (Sections [3.10](#), [4.10](#), [5.10](#), and [6.10](#)).

18 **Socioeconomics/Environmental Justice**

19 As identified in Chapter [5](#), the Proposed Action would not result in significant adverse
20 socioeconomic or environmental justice impacts. Similarly, no impacts have been identified
21 that would pose special risks to children. Additional annoyance could result from
22 experiencing F-35 training noise as well as proposed GLI training noise, particularly in the
23 immediate vicinity of designated GLI training locations. However, no disproportionately
24 adverse impacts to minority or low-income populations have been identified for the
25 Proposed Action, and none would be expected from a cumulative perspective when
26 considering other actions. There would likely be minor beneficial impacts to the economy as a
27 result of hiring local contractors to perform needed road/site improvements; however, such
28 impacts would be temporary. Overall, tourism and outdoor recreational activities such as
29 picnicking, camping, boating, fishing, and hunting would not be adversely affected by the
30 use of BRSF for training activities because implementation of the Proposed Action would not
31 prevent these activities from occurring in the same capacity as the baseline condition. While
32 the Proposed Action involves the use of publicly accessible state forest land, measures would
33 be taken to avoid conflicts with the public and minimize any potential impacts from restricted
34 access.

35 **7.4 TATE'S HELL STATE FOREST CUMULATIVE IMPACT ASSESSMENT**

36 **7.4.1 THSF Regional Past/Present/Reasonably Foreseeable Future Actions**

37 Similar to BRSF, actions potentially interacting with resources impacted by the Proposed
38 Action are limited to activities associated with THSF, since the affected resources related to
39 the Proposed Action are those within THSF and along its borders. The main action for
40 consideration under cumulative impacts for THSF is FFS implementation of the THSF Forest

1 Management Plan; this plan details specific forest management goals, objectives, and
2 projects that would be implemented over the specified planning period.

3 THSF multi-use forest resource management objectives are to:

- 4 • Restore, maintain, and protect all native ecosystems.
- 5 • Ensure the long-term viability of populations and species considered endangered,
6 threatened, or of special concern.
- 7 • Integrate human use through a total resource concept, not emphasizing any particular
8 use over the others or over restoration, maintenance, and protection of native
9 ecosystems.
- 10 • Protect known archaeological and historical resources.

11 Practice sustainable forest management utilizing sound silvicultural techniques
12 (FDACS, 2007).

13 Overall, the FFS implementation of the management plan would serve to conserve and
14 enhance the natural environment of THSF, and improve recreational opportunities at THSF;
15 this would not be expected to result in adverse impacts to THSF resources. Additionally, the
16 Proposed Action would be required to comply with applicable FFS forest management plan
17 requirements, thus ensuring no management conflicts between the Proposed Action and the
18 FFS management program.

19 The FFS is actively involved with ongoing and proposed projects to control erosion and
20 sedimentation in surface waters and wetlands. These projects include efforts to restore highly
21 eroded areas, monitoring recreational areas and uses to identify impacts on water resources,
22 and use of BMPs to protect water resources on the forest (FDACS, 2007). The main future
23 plans include road and trail evaluations to identify and rehabilitate problem areas
24 contributing to erosion and sedimentation in surface waters and wetlands and working with
25 NFWFMD to implement the hydrologic restoration plan for streams and wetlands at THSF
26 (NFWFMD, 2010a; NFWFMD, 2010b).

27 No county comprehensive or management plans were identified for Liberty or Franklin
28 County. However, it is expected that commercial logging activities outside the forest, but
29 within the affected county areas, would be similar to those for THSF. The road departments
30 for each county also provide ongoing operational maintenance of paved and unpaved roads
31 in the vicinity of THSF.

32 The beddown of an operational squadron of F-22 aircraft and detachment of T-38 aircraft at
33 Tyndall AFB will increase the demand on airspace in the region.

34 **7.4.2 Cumulative Impacts by Resource Area**

35 **Airspace Management**

36 The beddown of an operational squadron of F-22 aircraft and detachment of T-38 aircraft at
37 Tyndall AFB will increase the number of sorties flown in the Tyndall MOAs (U.S. Air Force,
38 2011b). Existing internal DoD coordination and scheduling processes would be sufficient to
39 de-conflict multiple DoD users of the training airspace. Cumulative impacts on airspace
40 management would be minimal.

1 Airspace in the region is currently somewhat congested, and demand for airspace is expected
2 to increase. The Strategic Plan developed as part of the GRASI includes several recommended
3 strategies that would improve ATC procedures, enhance military capacity, and enhance
4 collaboration among airspace users in the region. If these strategies are adopted, they would
5 to reduce the potential effects of continued growth in demand for available airspace on
6 regional traffic flow and efficiency of operations. Proposed GLI training would not typically
7 require use of SUA or extensive ATC management. GLI training would allow nonhazardous
8 training currently conducted in R-2915 to be conducted elsewhere, partially alleviating
9 scheduling concerns in a critical airspace unit. Cumulative impacts at a regional level would
10 be minimal and include beneficial impacts.

11 **Noise**

12 Individual overflight noise levels generated by F-22 and T-38 aircraft are higher than noise
13 levels generated by GLI training aircraft while operating at the same altitudes. However, F-22
14 and T-38 aircraft would typically operate at much higher altitudes than those used during GLI
15 training. As described in the *Environmental Analysis for F-22 Operational Squadron and T-38*
16 *Detachment at Tyndall AFB*, both F-22 and T-38 aircraft would spend 95 percent of training
17 time at altitudes above 10,000 feet MSL. The time-averaged noise level beneath Tyndall F
18 MOA would remain below 45 dB DNL_{mr}, and the noise level beneath Tyndall G MOA would
19 increase by 1 dB or less after beddown of these aircraft is complete (U.S. Air Force, 2011b).
20 Additional annoyance could result from F-22 training noise, as well as noise from proposed
21 GLI training, particularly in the immediate vicinity of designated training locations.

22 **Safety**

23 Airspace over the THSF region is regularly used by military aircraft and subject to aircraft
24 mishaps. The THSF region could see an increase in mishaps during training activities due to
25 the shift of operations to the area, while there would be less probability of mishaps at Eglin
26 AFB. However, the probability of an aircraft mishap is low and has not been identified as a
27 significant safety issue. Similarly, the overall potential for wildfires would shift from Eglin AFB
28 to the THSF region during training activities, but the overall number of wildfires occurring
29 within the region is not likely to increase or decrease in any substantive manner. The
30 probability of wildfires based on drought conditions, wildfire fuel load, and the number of
31 potential fire-starting activities would remain the same. Implementation of wildfire
32 prevention requirements as identified in Section [3.4](#) would minimize potential wildfire
33 occurrences. While there are potential safety concerns inherent to training activities, these
34 would be mitigated through implementation of SOPs and other constraints identified in
35 Section [3.4](#), thus minimizing the potential for cumulative impacts within the THSF region.

36 **Air Quality**

37 Any training activities would be consistent with the restoration and maintenance plans for
38 the state forests. Each plan outlines the resource protection measures designed to reduce
39 impacts for future use. Combined emissions from other aircraft operations in the area would
40 be minimal given that most aircraft, with the exception of those identified as part of the
41 Proposed Action, operate at altitudes that do not adversely affect air quality.

42 Analysis has shown that training activities would have a negligible impact to air quality;
43 therefore, negligible cumulative impacts to air quality are expected.

1 **Earth Resources**

2 Contributing vehicular use of public roads under the Proposed Action to access THSF could
3 increase the utilization of some county-maintained roads. However, the potential
4 incremental cumulative effects from soil erosion and sedimentation caused by military
5 vehicles would not diminish the life cycle of county road and crossing improvements and
6 would be insignificant.

7 **Water Resources**

8 The most frequent effect of surface disturbance in this region is accelerated erosion and
9 sediment deposition, which could affect water resources by contributing sediment,
10 introducing contaminants, or increasing flooding. The primary cumulative impacts on surface
11 water and wetlands would result from any increase in the acreage of earth-moving activities
12 and accelerated erosion from roads and trails, which could increase sediment delivery and
13 surface water runoff downstream or introduce chemical contaminants into surface water
14 bodies and wetlands.

15 All proposed training activities at THSF would be consistent with the forest management
16 plans and policies for the forest and hydrologic restoration plans for THSF. Proposed Air Force
17 training activities would comply with all federal, state, or local regulations. In addition, Air
18 Force environmental management regulations and policy contained in EAFBI 13-212, *Range*
19 *Planning and Operations*, and the *Interstitial Area Range Final Environmental Assessment*
20 *Revision 2* (U.S. Air Force, 2013c) identify specific measures to prevent potential adverse
21 effects to water resources from proposed training activities. These measures include, but are
22 not limited to, restricting vehicle access to existing roads, trails, and approved
23 stream/wetland crossings; establishing protective buffers around streams and wetlands; use
24 of BMPs to prevent soil erosion and sedimentation in streams and wetlands; and use of spill
25 prevention measures to prevent contamination in surface waters, aquifers, or wetlands from
26 fuel spills.

27 Impacts to water resources as a result of the proposed training activities would be minimized
28 as long as troops adhere to all environmental management requirements and proposed
29 mitigative measures. Therefore, the Air Force does not expect any of the proposed training
30 activities to incrementally contribute to other impacts to water resources at THSF.

31 **Biological Resources**

32 There is a potential for cumulative impacts resulting from the Proposed Action in
33 combination with recreation, silviculture, NFWMD hydrologic recovery efforts, and FFS
34 ecological management of THSF natural resources. Short- to medium-term adverse
35 cumulative impacts are initially anticipated, with long-term beneficial impacts once
36 effectiveness of NFWMD and FFS restoration programs is realized. The FFS would
37 continually cooperate with the U.S. military to facilitate mission-essential training in a manner
38 that does not adversely impact natural resources, forest management, or public access at
39 THSF.

40 **Cultural Resources**

41 Damage to the nature, integrity, and spatial context of cultural resources can have a
42 cumulative impact if the initial act is compounded by other similar losses or impacts. The

1 alteration or demolition of historic structures or the disturbance or removal of cultural
2 artifacts may incrementally impact the cultural and historic setting of THSF.

3 Recreational activities and forestry management practices at THSF have long occurred in the
4 training areas under consideration for the Proposed Action. The inclusion of additional
5 training activities at THSF such as those that currently occur on Eglin AFB, if unrestrained,
6 could cumulatively impact various resources. These activities, which involve cross-country
7 ground movement and other potentially ground-disturbing activities, are guided by
8 previously mentioned operating instructions, such as EAFBI 13-212, as well as numerous other
9 agreed-upon stipulations resulting from other actions. These operating instructions, as
10 discussed in Section [3.9.4](#), would be implemented at THSF as well. Thus, given the required
11 coordination with THSF staff and 96 CEG/CEIEA Cultural Resources Office, required mitigation
12 and BMPs, as well as any measures recommended by the SHPO, mission activities are not
13 expected to contribute to cumulative impacts to archaeological resources.

14 **Land Use**

15 When combined with past, present, or reasonably foreseeable actions, no cumulative impacts
16 to land use receptors is anticipated, since the impacts at THSF would not carry any significant
17 long-term adverse impacts. Land use impacts are not anticipated to have cumulative impacts
18 at THSF. The Proposed Action would not result in incompatibilities with existing activities,
19 land use regulations, or planning documents (see [Table 3-40](#)). As discussed in Sections [3.10](#),
20 [4.10](#), [5.10](#), and [6.10](#), the timing and location of training activities and emitter site operations,
21 as well as the mitigation measures presented in these sections, would prevent or minimize
22 any potential impacts to land use receptors. No regional cumulative impacts are anticipated
23 to land use receptors considering other activities occurring in the northwest Florida region.

24 **Socioeconomics/Environmental Justice**

25 As identified in Chapter [6](#), the Proposed Action would not result in significant adverse
26 socioeconomic or environmental justice impacts. No adverse impacts to local populations
27 have been identified from the Proposed Action. Similarly, no impacts have been identified
28 that would pose special risks to children. Additional annoyance could result from F-22
29 training noise as well as proposed GLI training noise, particularly in the immediate vicinity of
30 designated GLI training locations. However, no disproportionately adverse impacts to
31 minority or low-income populations have been identified for the Proposed Action, and none
32 would be expected from a cumulative perspective when considering other actions. There
33 would likely be minor beneficial impacts to the economy as a result of hiring local contractors
34 to perform needed road/site improvements; however, such impacts would be temporary.
35 Tourism and outdoor recreational activities such as picnicking, camping, boating, fishing, and
36 hunting would not be affected by the use of THSF for training activities. While the Proposed
37 Action involves the use of publicly accessible state forest land, measures would be taken to
38 avoid conflicts with the public and minimize any potential impacts from restricted access.

1 8. NO ACTION ALTERNATIVE IMPACT ANALYSIS

2 Implementation of the No Action Alternative means that none of the Proposed Action
3 components as described in Sections [2.3.1](#) and [2.3.2](#) would occur at the respective locations
4 (emitter sites, BRSF, and THSF). All activities would remain on Eglin AFB and no new emitter
5 sites would be established.

6 There would be no impacts to the proposed emitter sites, BRSF, or THSF beyond those
7 resulting from normal activities at these locations, such as recreational use and typical forest
8 management activities conducted by the FFS as identified in the respective state forest
9 management plans. Evaluation of the impacts of these activities on the affected environment
10 is beyond the scope of this EIS.

11 Impacts to the Eglin Range and associated airspace would be as described in the *Eglin AFB*
12 *Final Interstitial Range Environmental Assessment Revision 2* (U.S. Air Force, 2013c), the *Eglin AFB*
13 *Riverine/Estuarine Final Programmatic Environmental Assessment* (U.S. Air Force, 2004), and the
14 *Eglin AFB Final Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force,
15 2006).

16 Implementation of the No Action Alternative would not meet the purpose and need for the
17 Proposed Action, and would result in continued scheduling issues between nonhazardous
18 ground training operations and hazardous testing and training operations.

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9. OTHER NEPA CONSIDERATIONS

9.1 RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

Short-Term Uses

The Proposed Action would have minor short-term effects related to use of resources during land improvements in support of FWALS and HLZs, consumptive use, traveling, use of produced materials, fuels, etc. As a mitigating component of short-term uses of the environment, the Proposed Action would create economic benefits during training activities in the form of some jobs and the direct and indirect demand for goods and services (see Sections [3.11](#), [4.11](#), and [5.11](#) – Socioeconomics).

Long-Term Productivity

Based on analysis of the Proposed Action provided in Chapters [3](#) through [7](#), the Air Force has not identified any long-term adverse impacts to productivity as a result of unmitigated short-term impacts. The scope of activities associated with the Proposed Action would result in minor long-term productivity benefits as the GLI would be a program wherein training activities occur intermittently over time; thus, short-term increases in direct and indirect demand for goods and services while training activities occur would be intermittent over the long term as the GLI program is established and implemented. Long-term benefits to the FFS associated with lease fees would be realized through leasing agreements; however, this is not an easily quantifiable impact since it is unknown how this income would be distributed within the state government. If these funds were directed back to the specific state forest, then there would be a direct benefit to each forest.

Short-Term Uses Versus Long-Term Productivity

The assessment of effects on long-term productivity is related to whether the project is consistent with long-term regional and local planning objectives. Under the Proposed Action, there would be minor increases in employment, income, and net fiscal benefits and revenues to the FFS and surrounding communities during training activities. Training activities at the state forests would be scheduled to avoid conflict with hunters and other recreational users, thus avoiding impacts to long-term productivity associated with recreational use of the forests. Local short-term impacts to resources would be consistent with the regional, state, and local long-term planning objectives.

9.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis identify any irreversible and irretrievable commitments of resources involved in the implementation of the Proposed Action or alternatives. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that

1 cannot be restored as a result of the action (e.g., extinction of a threatened or endangered
2 species or the disturbance of a cultural site).

3 Implementing the Proposed Action would require a commitment of natural, physical, human,
4 and fiscal resources. In all of these categories, irreversible and irretrievable commitments of
5 resources would occur in the form of utilization of energy resources such as fossil fuels (for
6 transportation, associated with utility use, etc.). However, these physical resources should
7 generally be in sufficient supply that their commitment would not have an adverse effect on
8 the resources' local, regional, or national continued or future availability. Land disturbance as
9 described in the Proposed Action would not result in irretrievable resource commitments, as
10 any land disturbance would be minor in nature and would be recoverable over the short-to-
11 medium term.

12 While none of the proposed activities involve direct habitat alteration, some biological
13 resources would be directly lost as a result of consumptive use during training activities;
14 however, no sensitive species would be impacted, and the amount of general wildlife species
15 taken would be insignificant when compared to the amount of hunting taking place at each
16 proposed location. Incidental contact (such as a vehicle strike) may also result in incidental
17 mortality to some species; while this cannot be completely avoided, the potential can be
18 minimized by implementation of the General Operational Constraints and Proposed
19 Resource-Specific Mitigations identified in this EIS.

20 **9.3 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES AND** 21 **MITIGATION MEASURES**

22 Energy requirements associated with the Proposed Action are limited to use of fossil fuels in
23 support of transportation and utility use. Conservation potential for this resource is limited to
24 general energy conservation techniques, such as making sure no lights remain on at
25 hardened camp sites, transportation pooling, etc.

26 **9.4 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION** 27 **POTENTIAL**

28 While use of natural resources as a component of the training environment would occur at
29 each forest (e.g., consumption training), use of natural resources for the Proposed Action is
30 expected to be "non-intrusive," in the sense that the goal of the Air Force in implementing the
31 Proposed Action is to avoid to the greatest extent possible adverse impacts to natural and
32 anthropogenic resources and to be compatible with FFS forest management plans. To this
33 end, the Air Force has developed General Operational Constraints and Proposed Resource-
34 Specific Mitigations to avoid or minimize impacts on the environment. Consequently, the Air
35 Force will support conservation measures of the FFS through implementation of these
36 requirements. Other than use of fossil fuels as discussed previously, there are no
37 requirements for depletable resources associated with the Proposed Action.

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1 13. GLOSSARY

2 *Accretion* is the gradual increase or extension of land by natural forces acting over a long
3 period of time, as on a beach by the washing up of sand from the sea floor or a floodplain by
4 the accumulation of sediment deposited by a stream.

5 *Airspace – Class C, D, E* refers to controlled airspace designations as defined by the Federal
6 Aviation Administration in order JO 7400.2J, Part 4 Chapter 14, Section 1
7 (http://www.faa.gov/air_traffic/publications/atpubs/AIR/air1401.html).

8 *Alluvial* pertains to the materials or processes associated with stream sediment transportation
9 and deposition whereas *fluvial* pertains to waterways produced by stream or river action.

10 *Deltaic* refers to land formation processes associated with alluvium, nearly flat and fan-
11 shaped, depositions at or near the mouth of a river or stream where it enters a body of
12 relatively quiet water such as a lake or sea.

13 *Karst* is a kind of topography formed in limestone, gypsum, or other soluble rocks by
14 dissolution.

15 *Land-surface form* is the description of a given terrain area based on empirical analysis of the
16 land surface rather than interpretation of genetic factors. Surface form may be expressed
17 quantitatively in terms of vertical and planimetric slope-class distribution, local and absolute
18 relief, and patterns of terrain features such as drainage lines or terraces.

19 *RNAV*, or Area Navigation, can be defined as a method of navigation that permits aircraft
20 operation on any desired course within the coverage of station-referenced navigation signals
21 or within the limits of a self-contained system capability, or a combination of these.

22 *Solution pipe* refers to a subsurface, vertical, cylindrical or cone-shaped hole, formed by
23 dissolution in soluble limestone bedrock. These features often are without surface expression
24 filled with soil materials and serve as a bypass rout for internal water flow.

25 *Stratigraphy* is the branch of geology that deals with the definition and interpretation of
26 layered earth materials; the conditions of their formation; their character, arrangement,
27 sequence, age, and distribution; and their correlation by the use of fossils and other means.

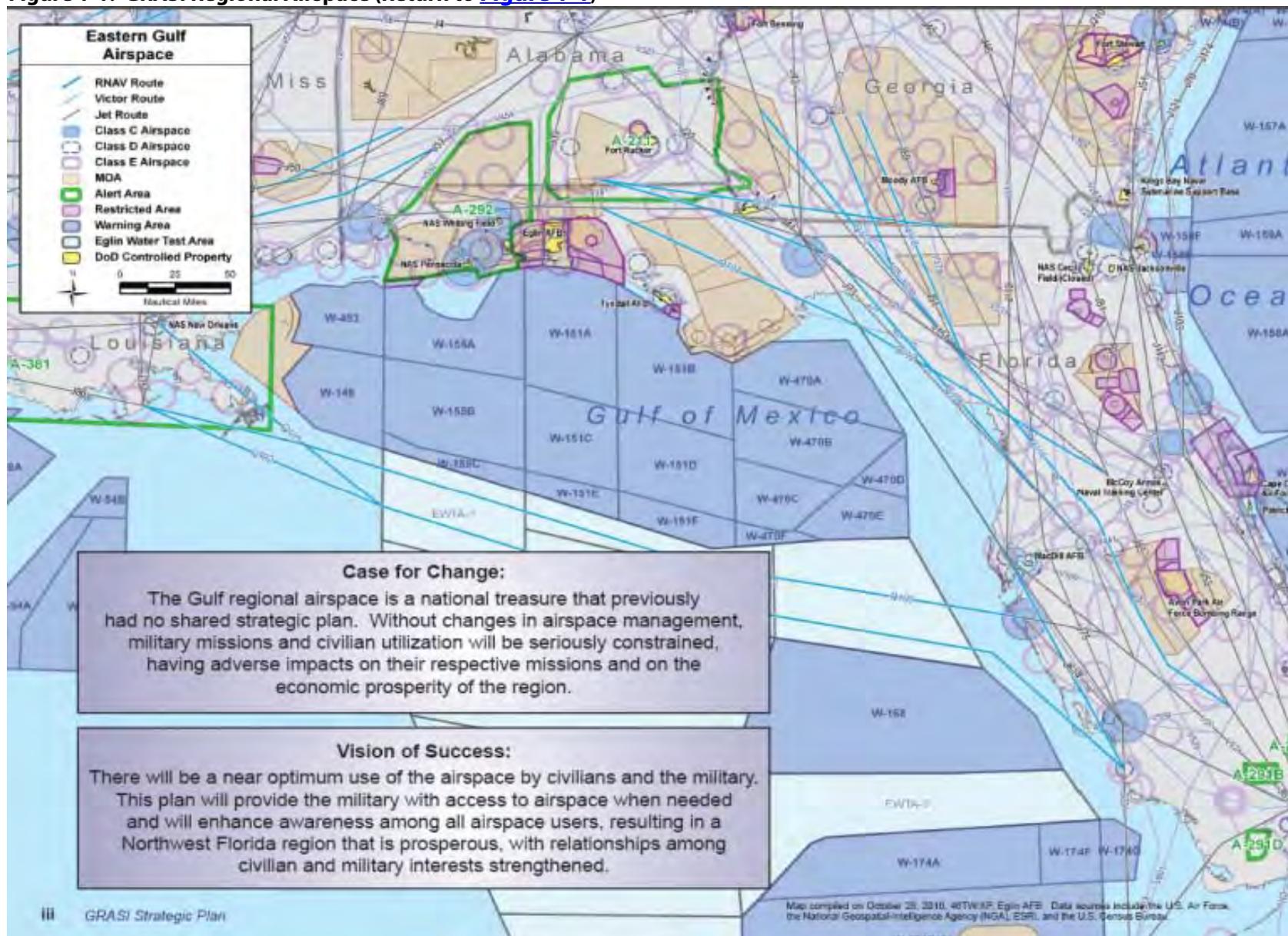
28 *Tolerable erosion rate* refers to an erosion rate that is lower than the rate of soil development.
29 Soils are assigned a tolerance value primarily based on the thickness of the soil above
30 bedrock or unaltered parent material.

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APPENDIX A PRINTABLE MAPS

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Figure 1-1. GRASI Regional Airspace (Return to [Figure 1-1](#))



Case for Change:

The Gulf regional airspace is a national treasure that previously had no shared strategic plan. Without changes in airspace management, military missions and civilian utilization will be seriously constrained, having adverse impacts on their respective missions and on the economic prosperity of the region.

Vision of Success:

There will be a near optimum use of the airspace by civilians and the military. This plan will provide the military with access to airspace when needed and will enhance awareness among all airspace users, resulting in a Northwest Florida region that is prosperous, with relationships among civilian and military interests strengthened.

Figure 1-2. Location of Blackwater River and Tate's Hell State Forests (Return to [Figure 1-2](#))

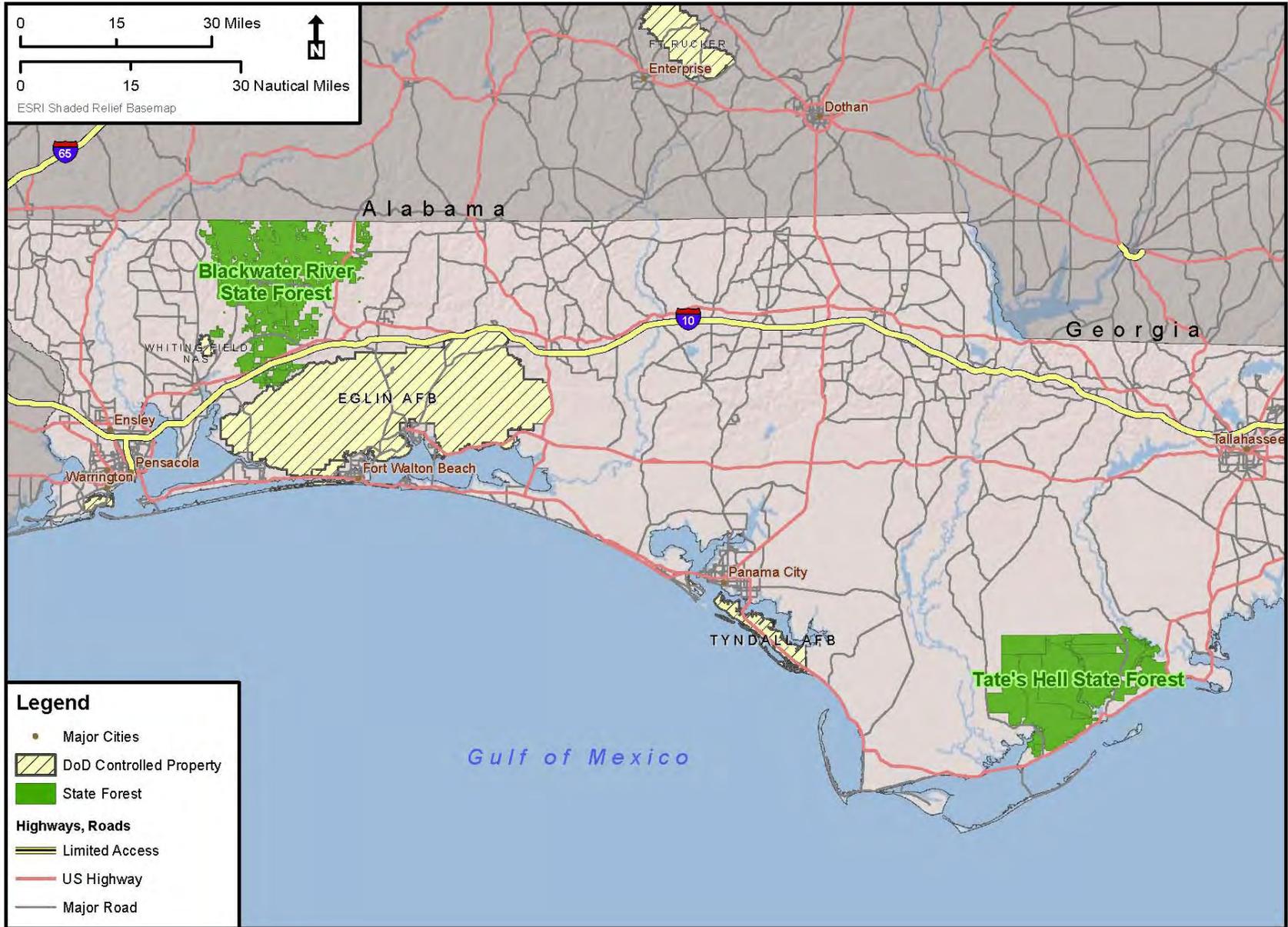


Figure 2-1. Potential Emitter Sites (Return to [Figure 2-1](#))

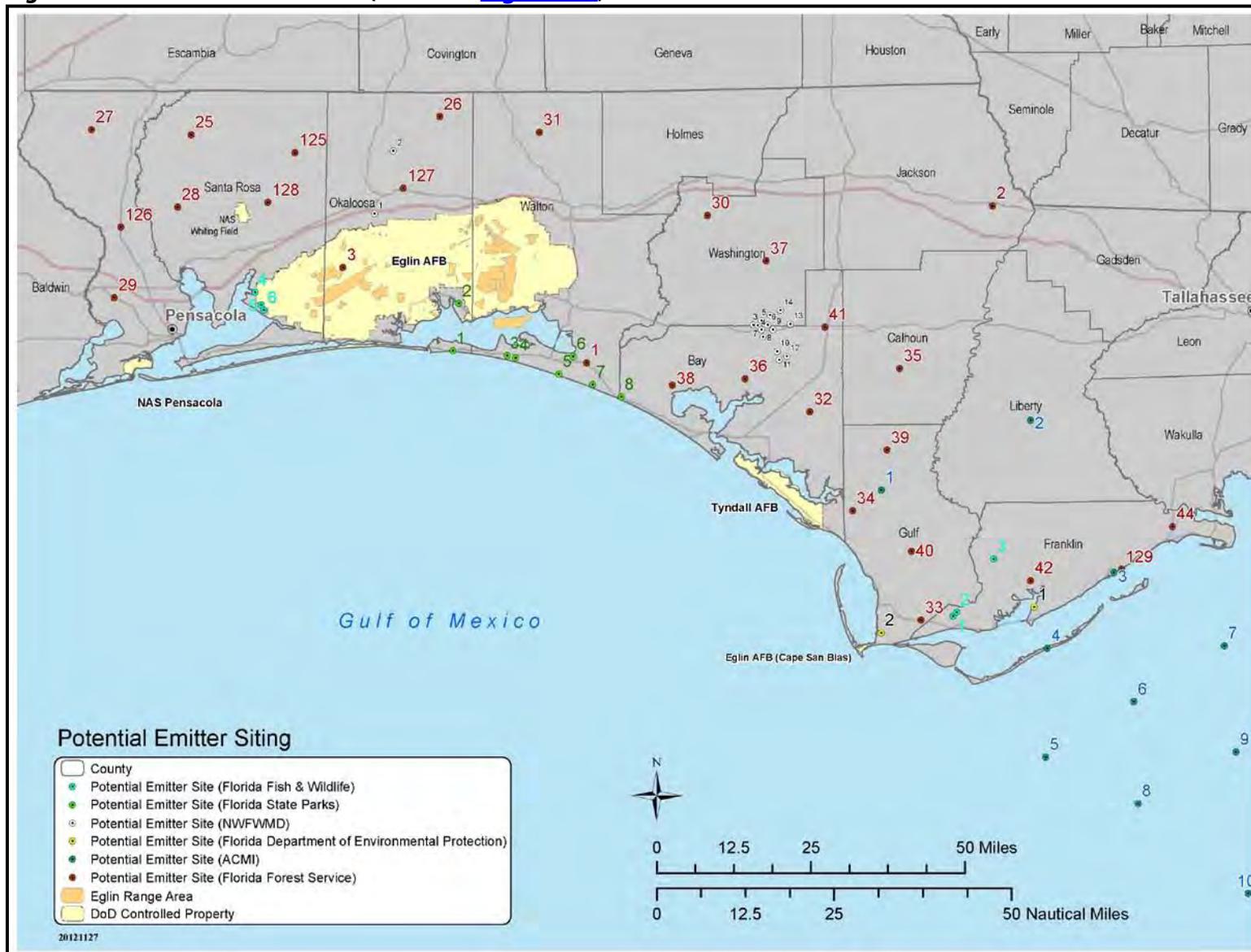
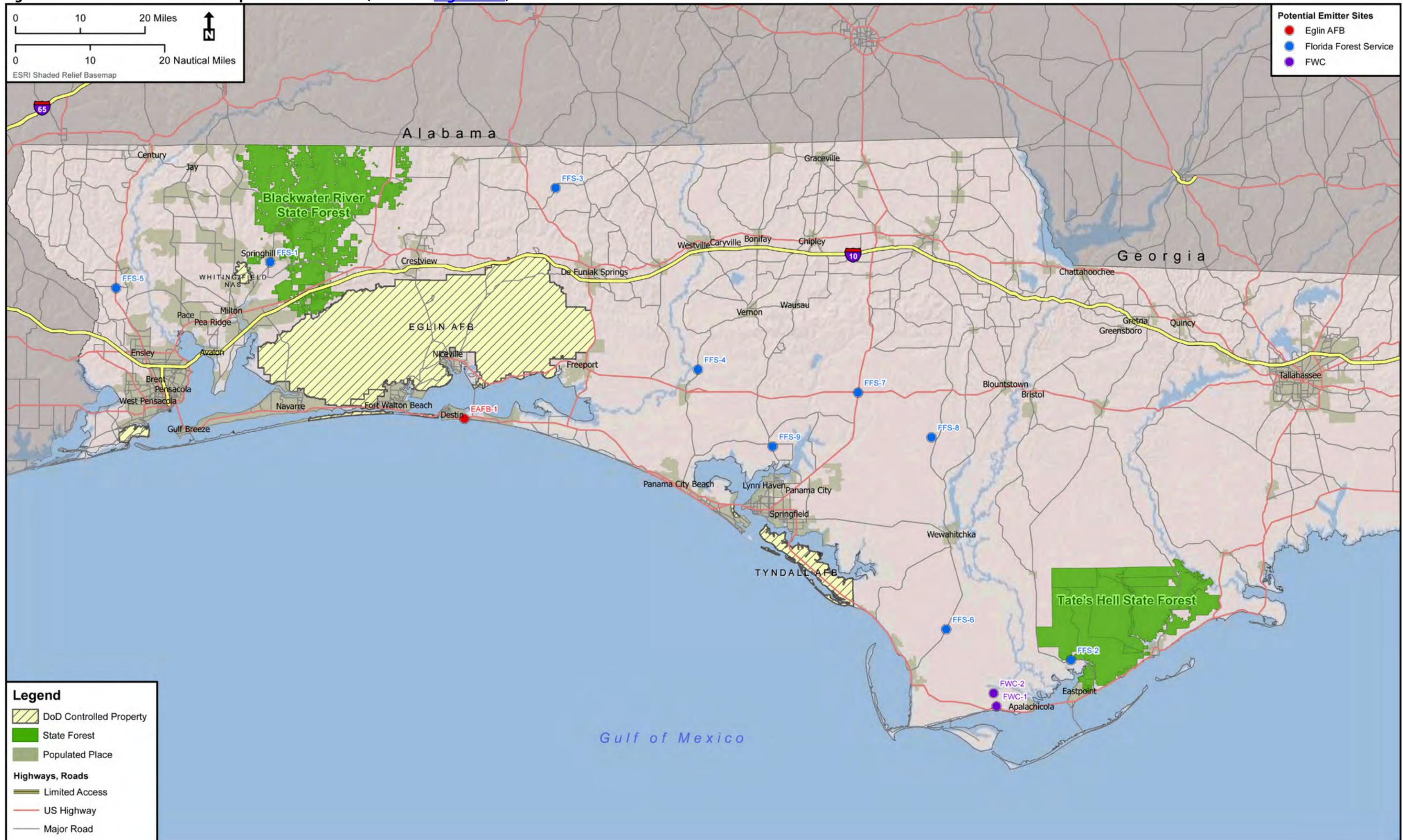


Figure 2-2. Federal and State Lands Within 150-Nautical Mile Radius of Eglin AFB (Return to [Figure 2-2](#))



Figure 2-3. Location Overview of Proposed Emitter Sites (Return to [Figure 2-3](#))



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Figure 2-4. Regional View (West) of Proposed Emitter Sites (Return to [Figure 2-4](#))

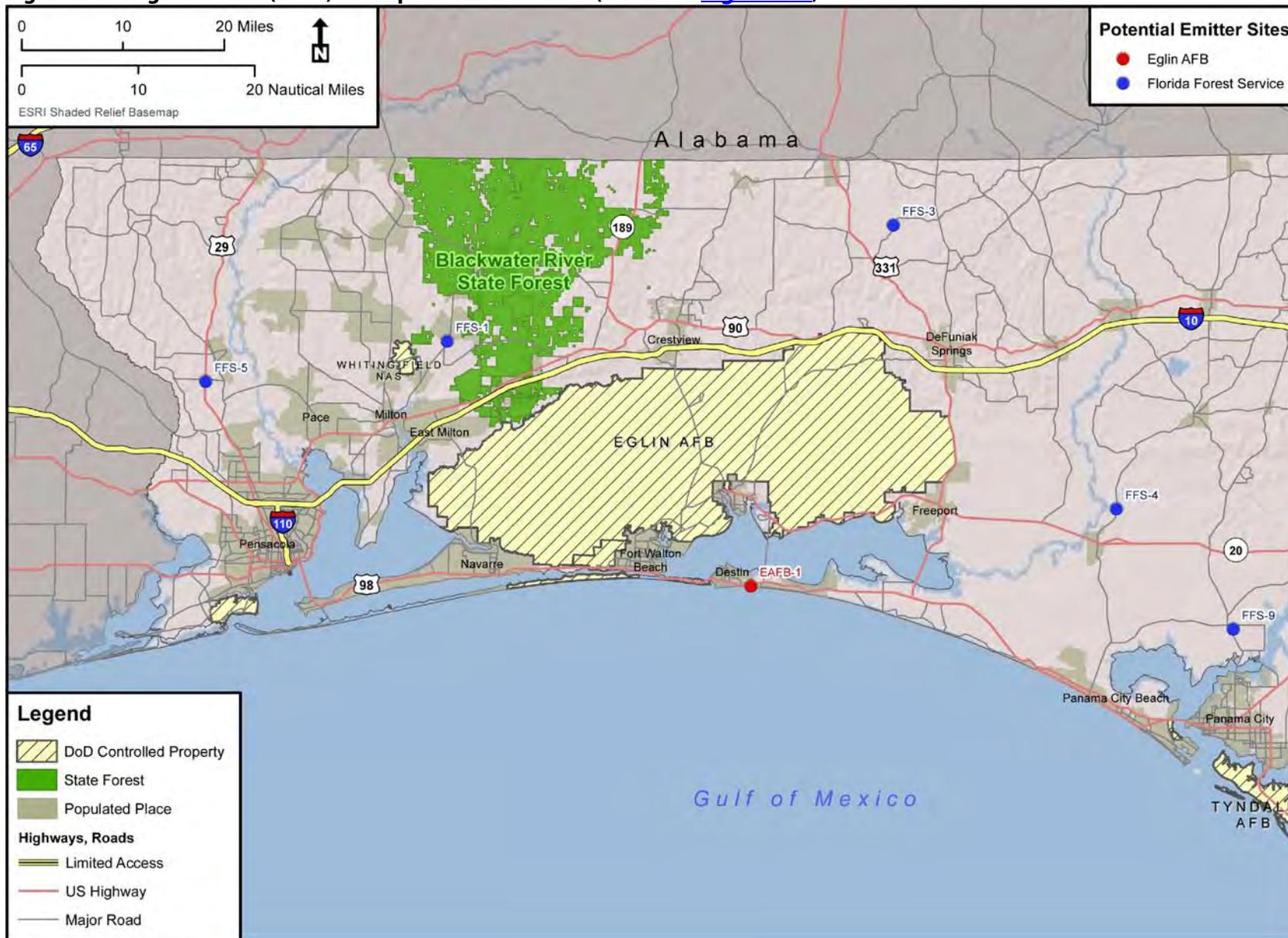


Figure 2-5. Regional View (East) of Proposed Emitter Sites (Return to [Figure 2-5](#))

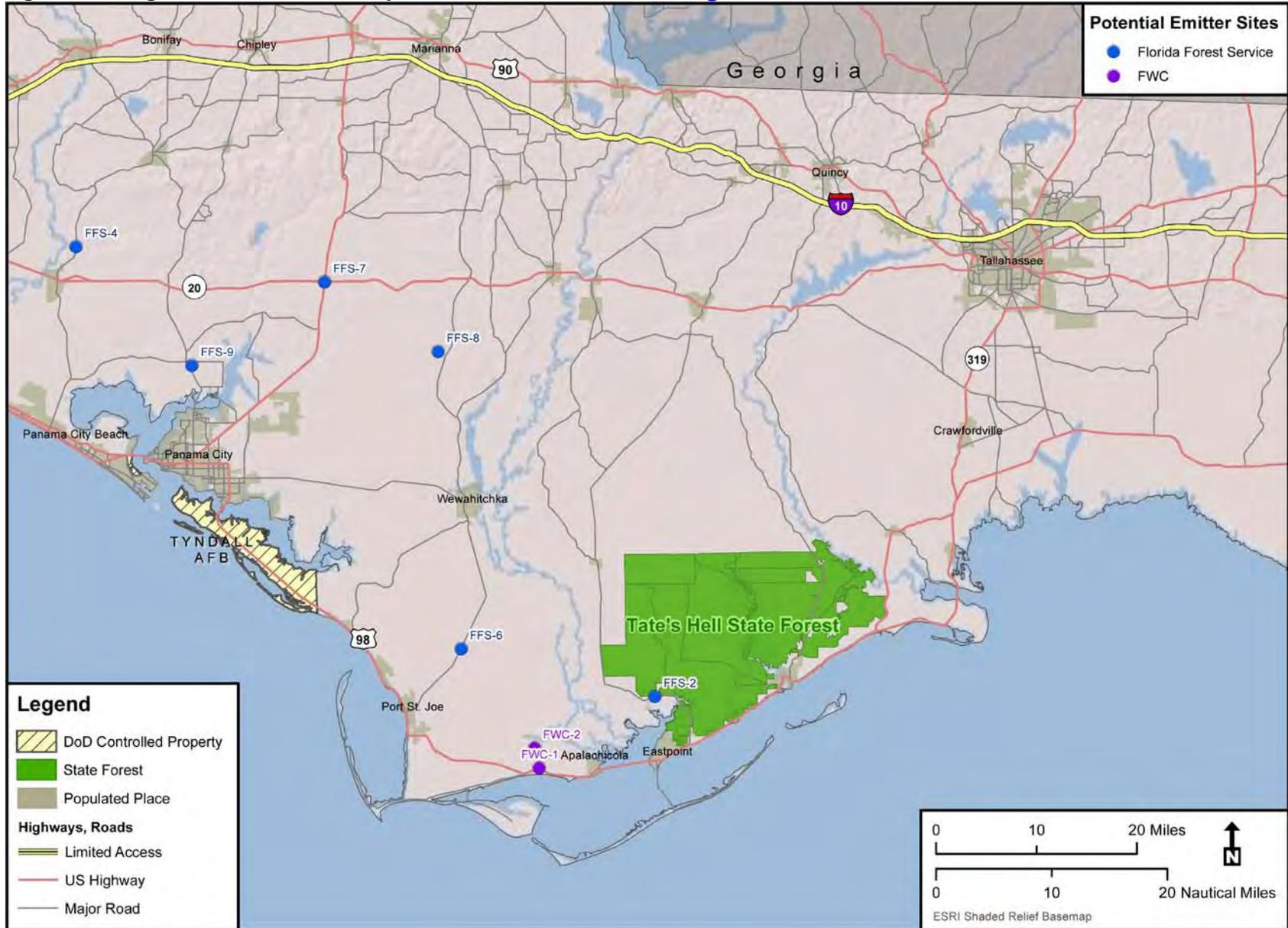


Figure 2-6. BRSF Tactical Areas (Return to [Figure 2-6](#))

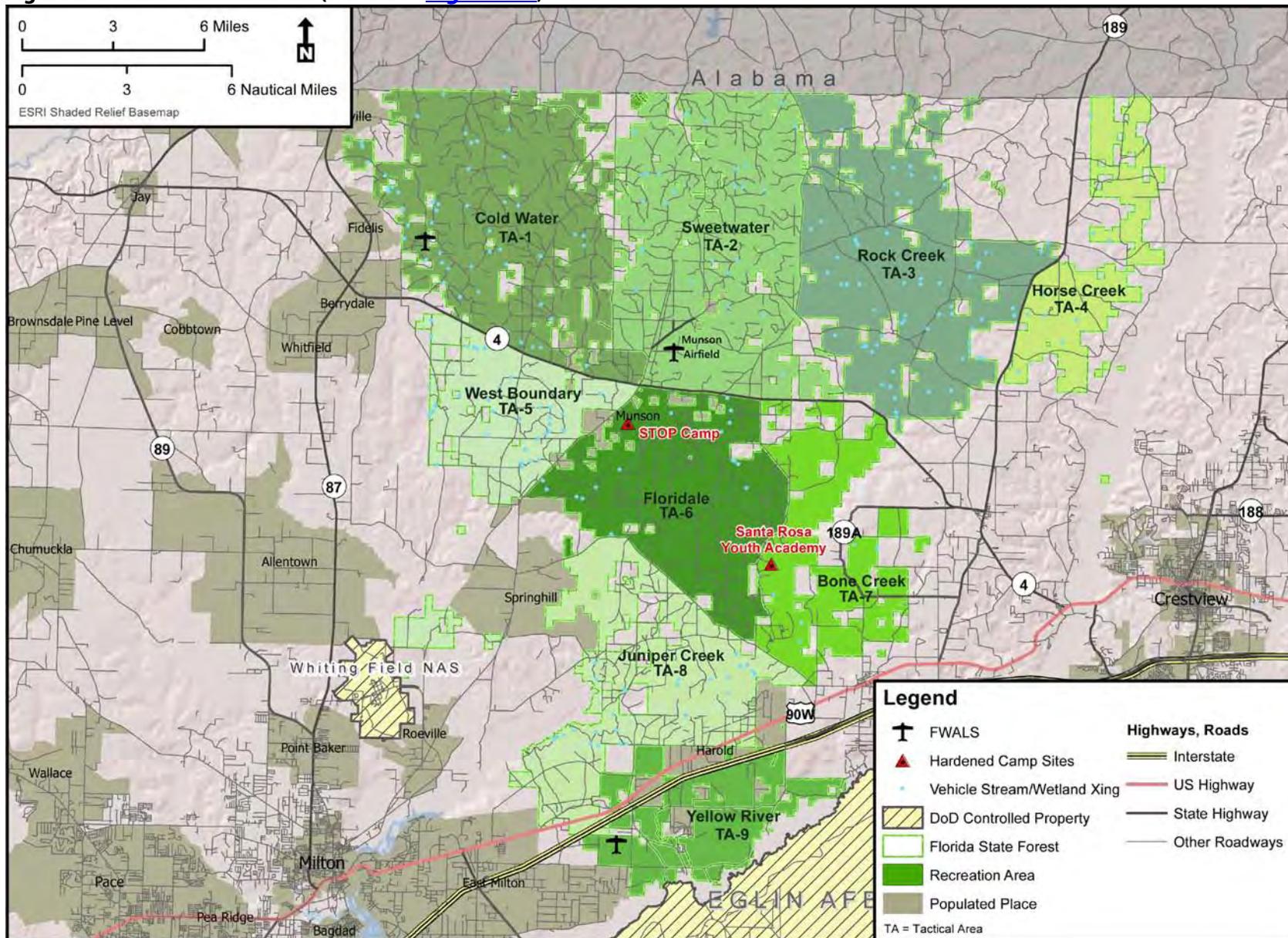


Figure 2-7. THSF Tactical Areas (Return to [Figure 2-7](#))

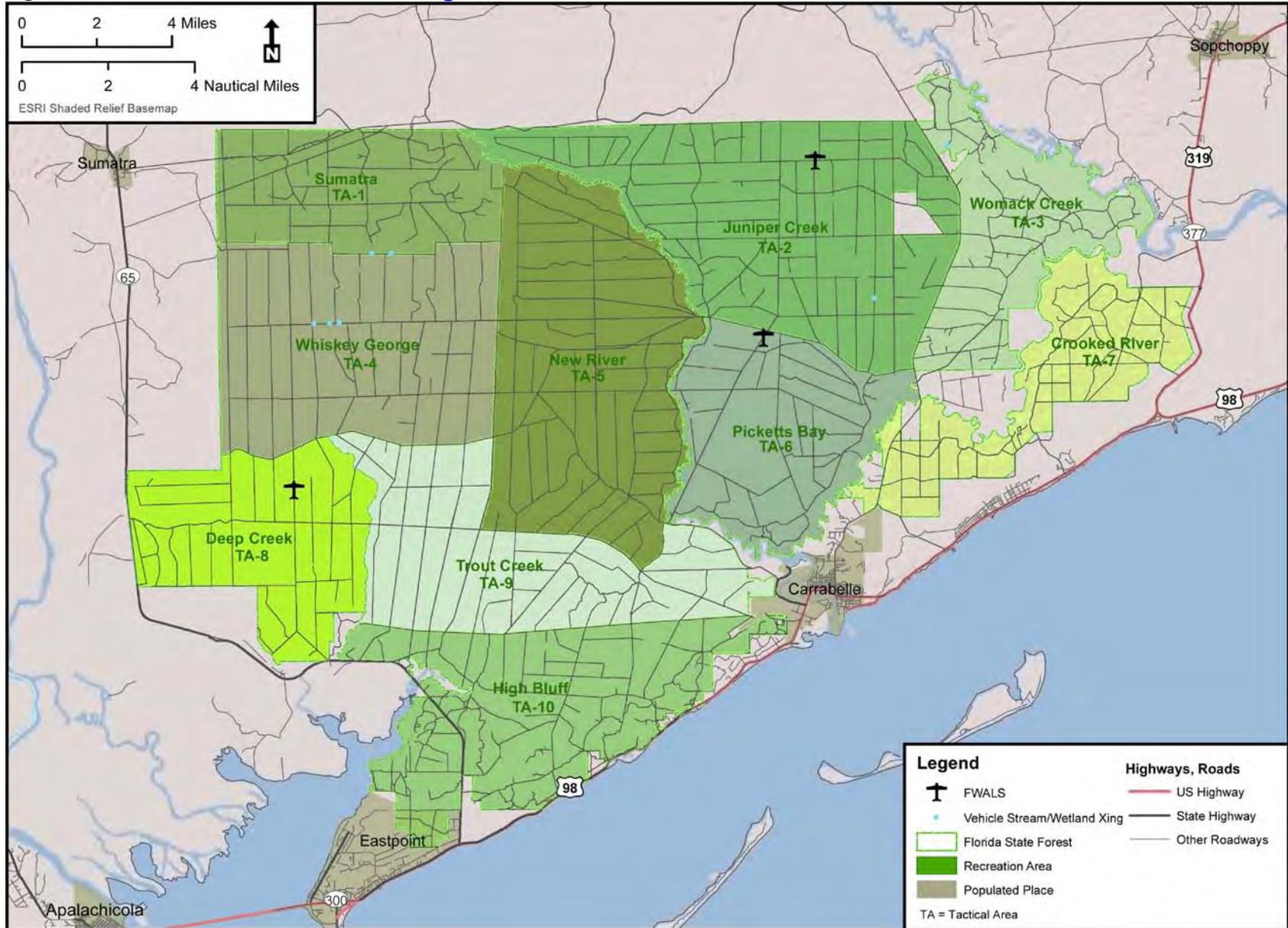


Figure 2-8. BRSF TA-2 (Munson) Airstrip (Return to [Figure 2-8](#))

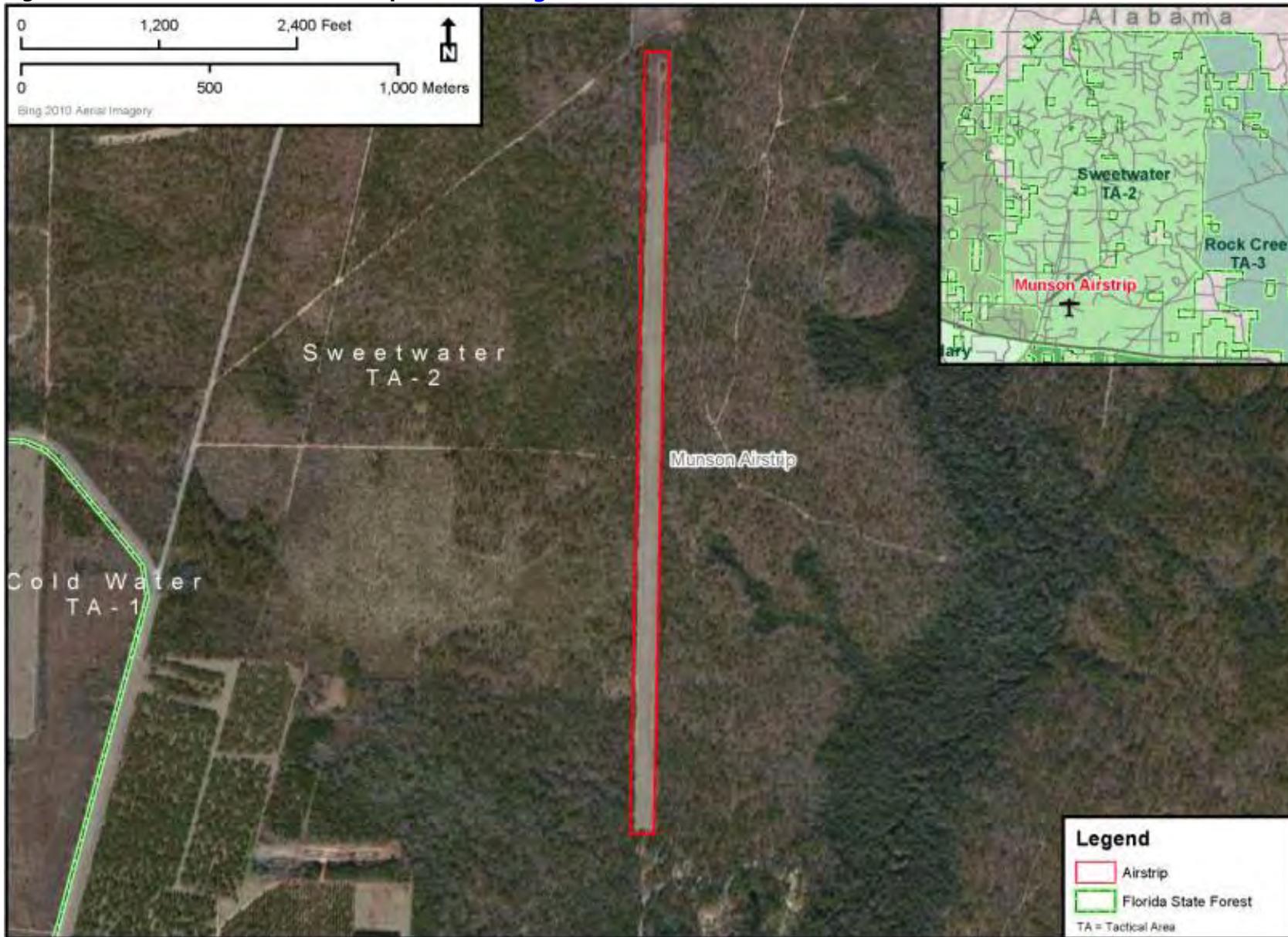


Figure 2-9. BRSF TA-1 FWALS (Return to [Figure 2-9](#))

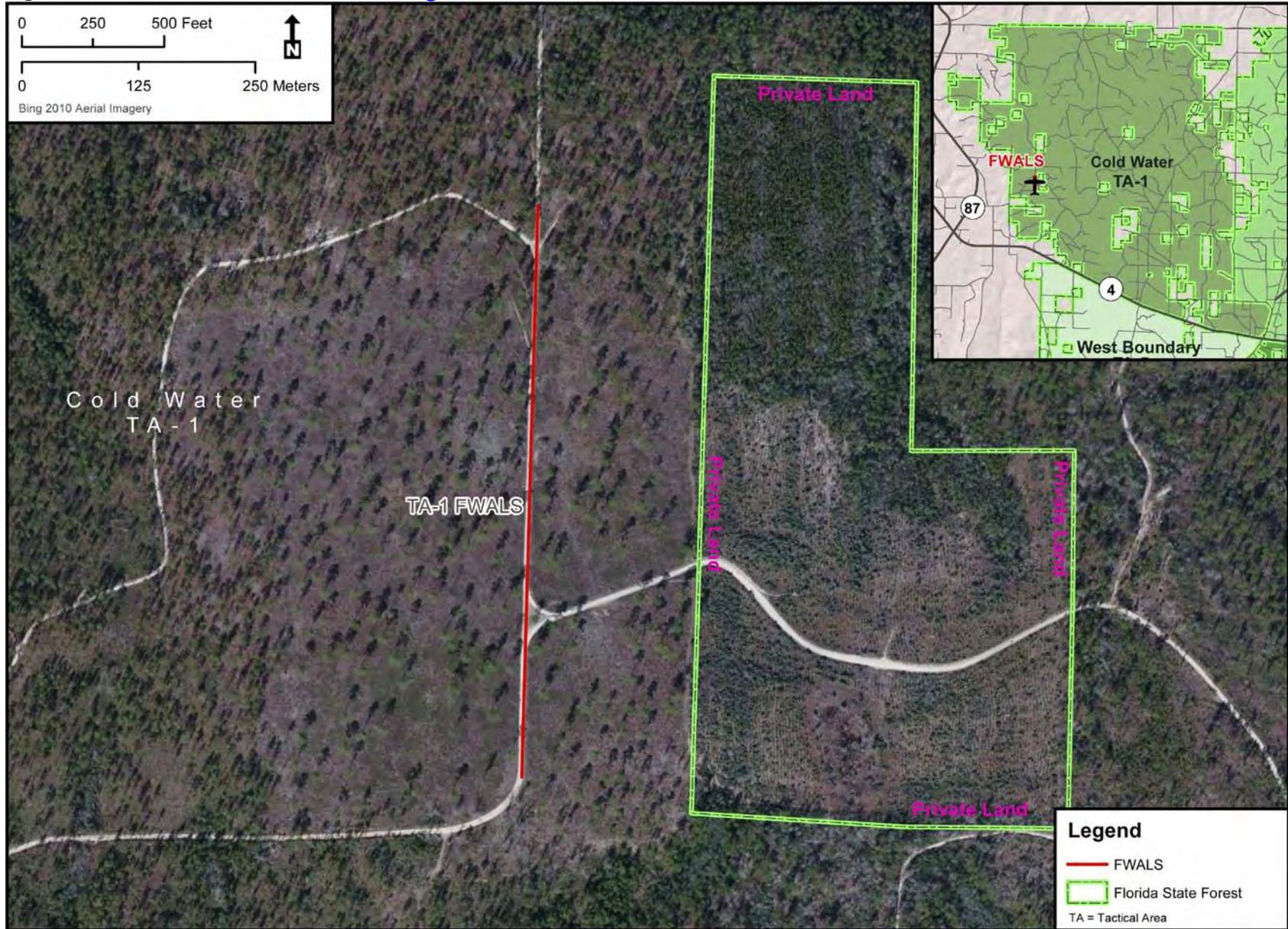


Figure 2-10. BRSF TA-9 FWALS (Return to [Figure 2-10](#))

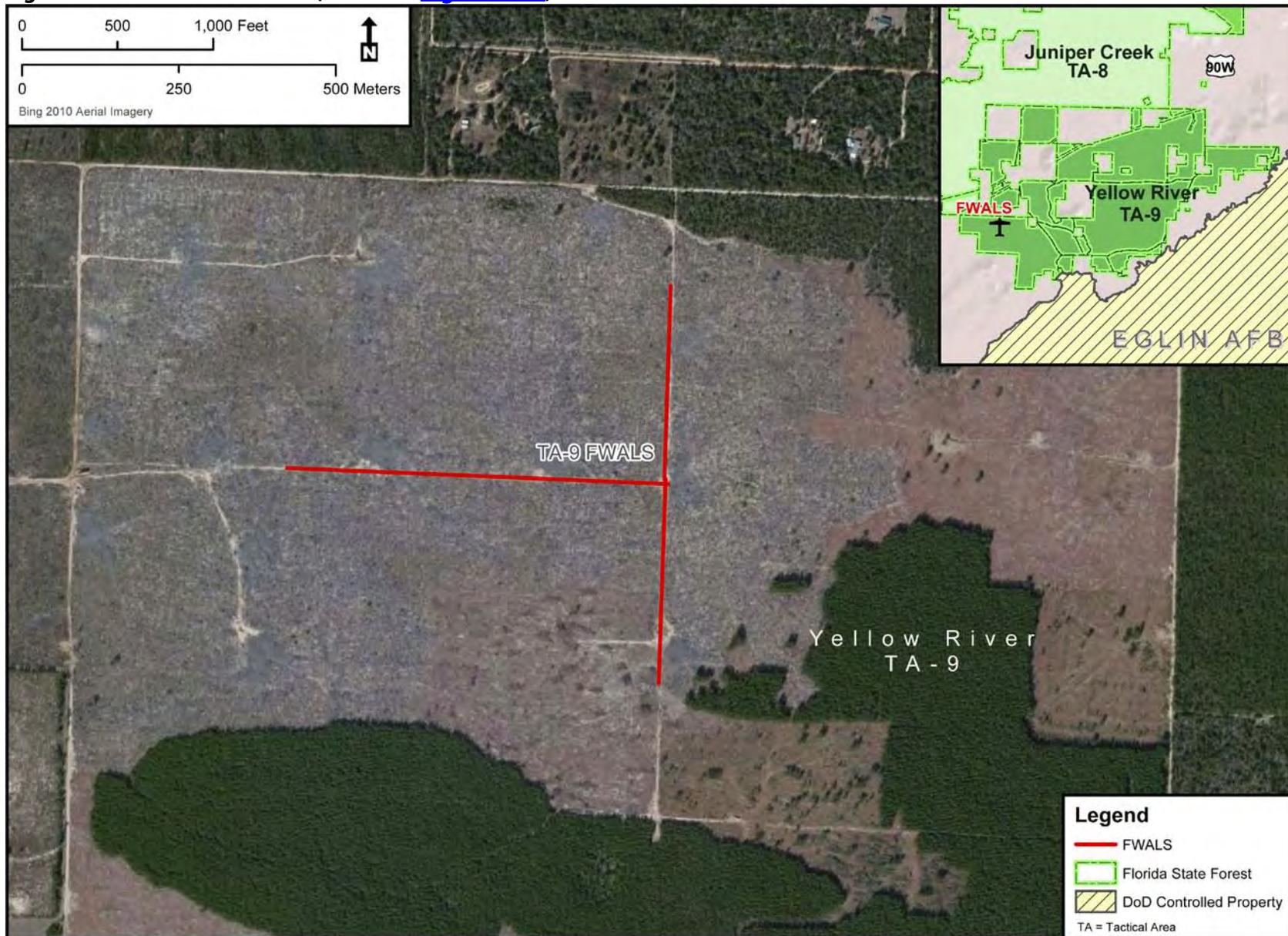


Figure 2-11. THSF TA-2 FWALS (Return to [Figure 2-11](#))

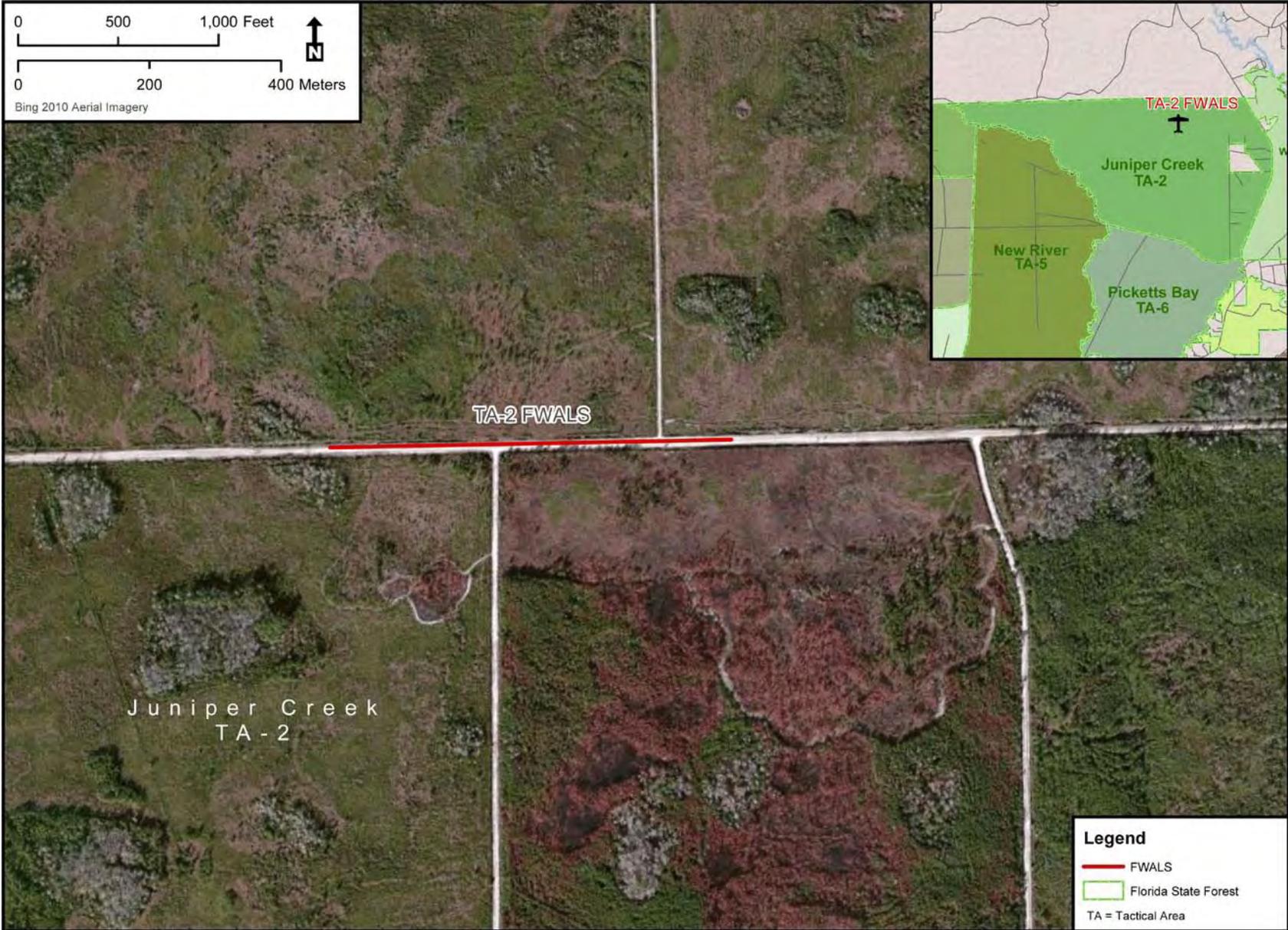


Figure 2-12. THSF TA-6 FWALS (Return to [Figure 2-12](#))

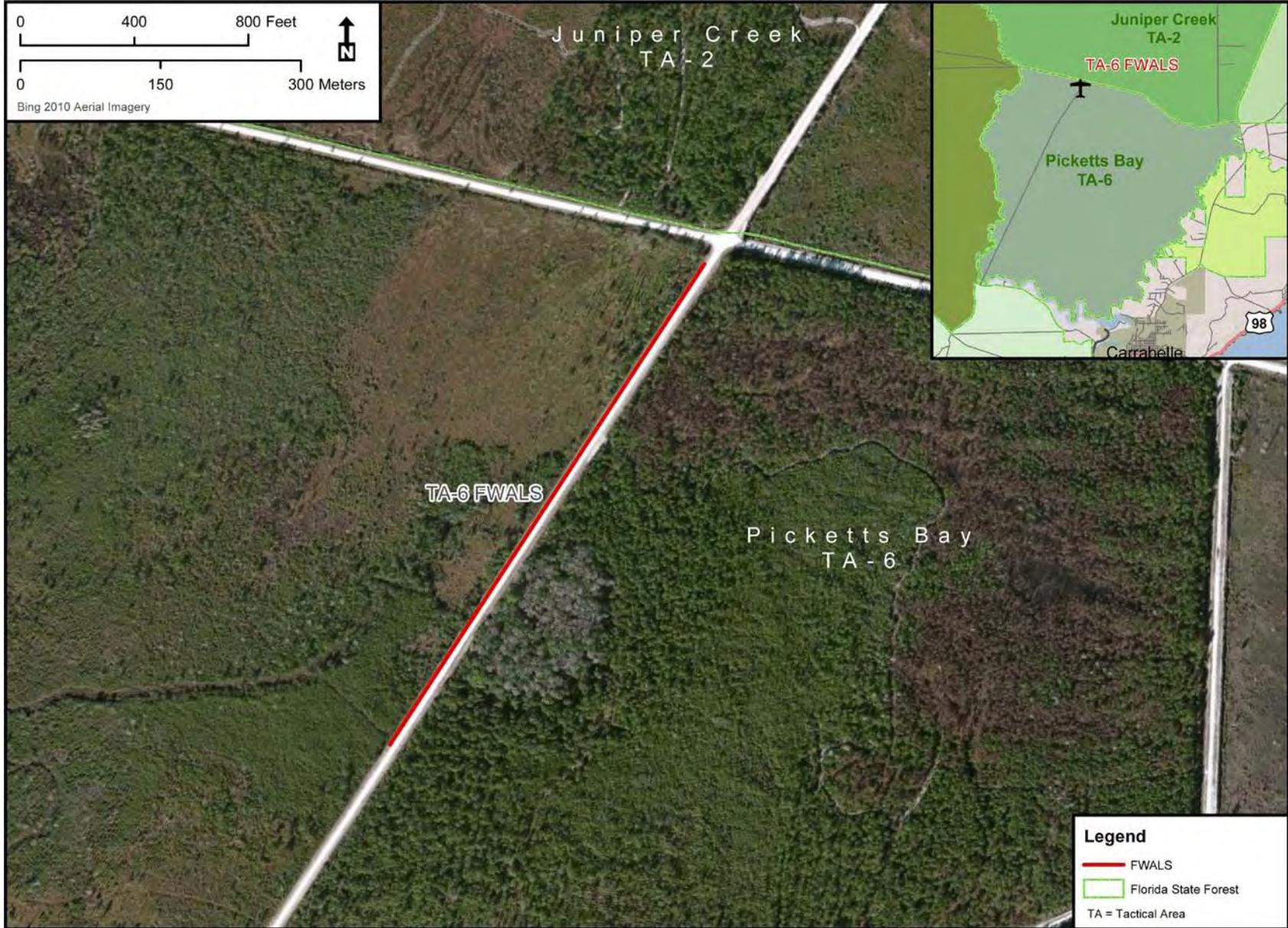


Figure 2-13. THSF TA-8 FWALS (Return to [Figure 2-13](#))

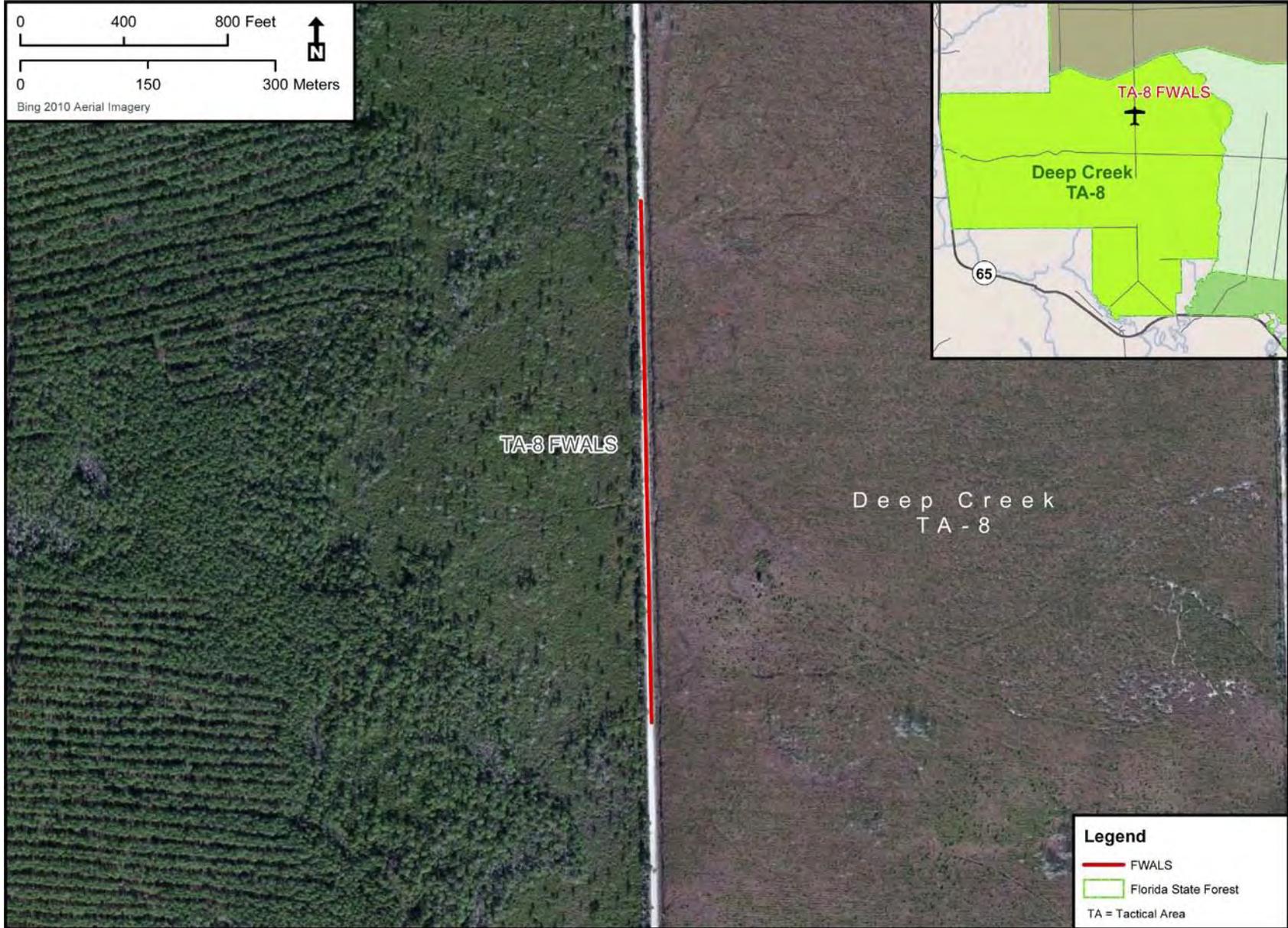


Figure 2-14. BRSF STOP Camp (Return to [Figure 2-14](#))



Figure 2-15. BRSF SRYA Camp (Return to [Figure 2-15](#))



Figure 5-1. BRSF Ground Operations Protection Levels (Return to [Figure 5-1](#))

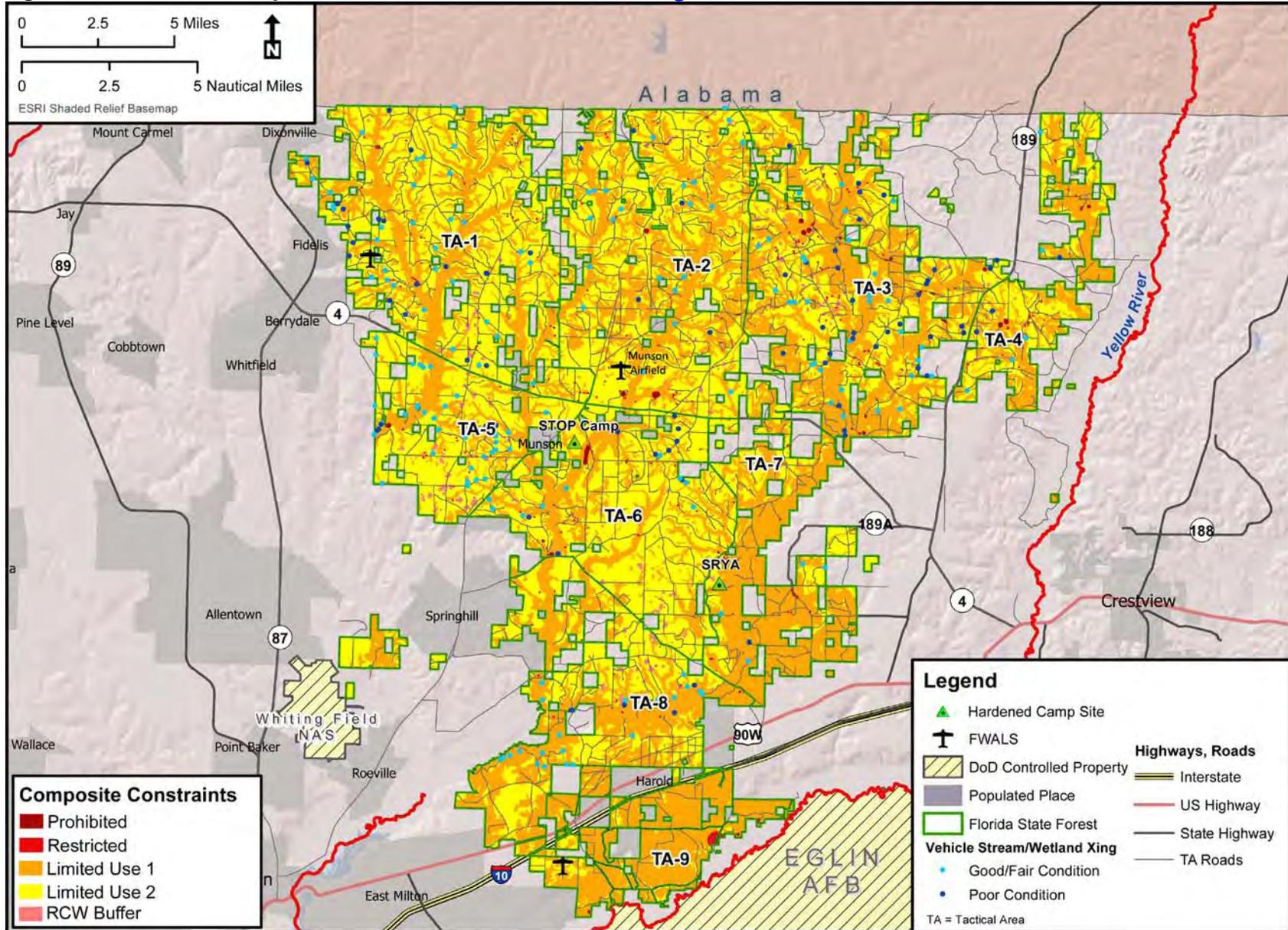


Figure 5-2. BRSF TA-1 Ground Operations Protection Levels (Return to [Figure 5-2](#))

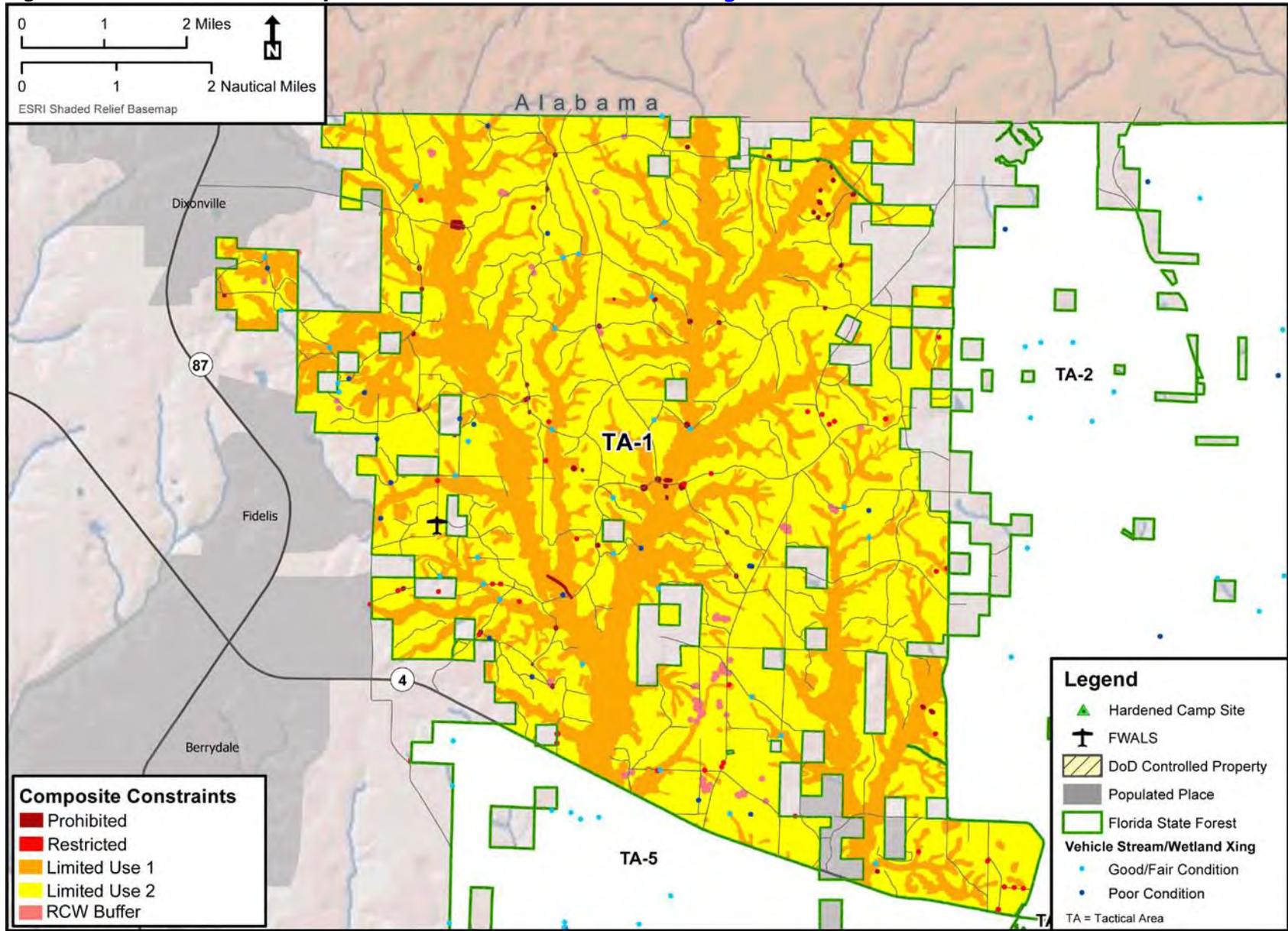


Figure 5-3. BRSF TA-2 Ground Operations Protection Levels (Return to [Figure 5-3](#))

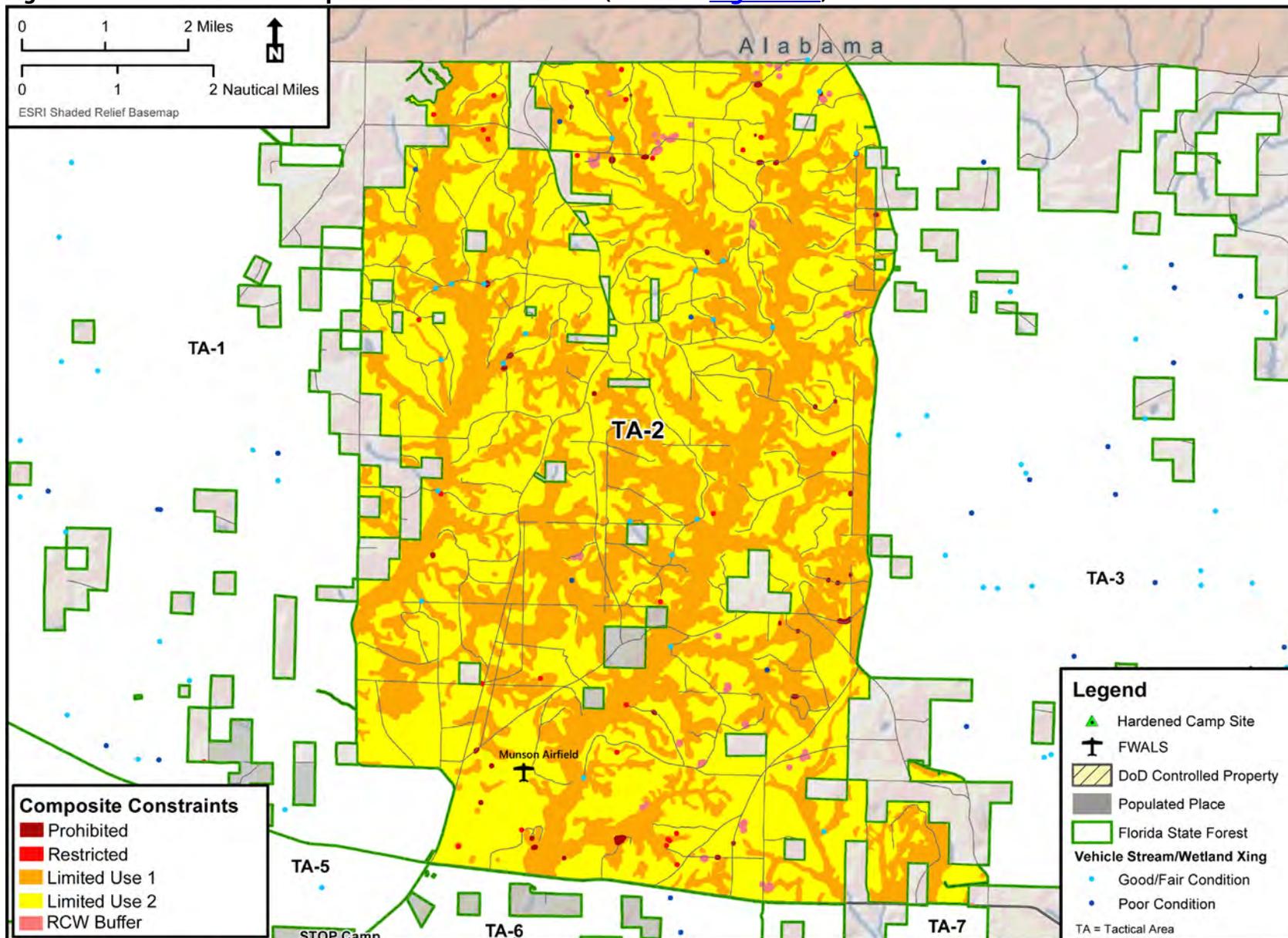


Figure 5-4. BRSF TA-3 Ground Operations Protection Levels (Return to [Figure 5-4](#))

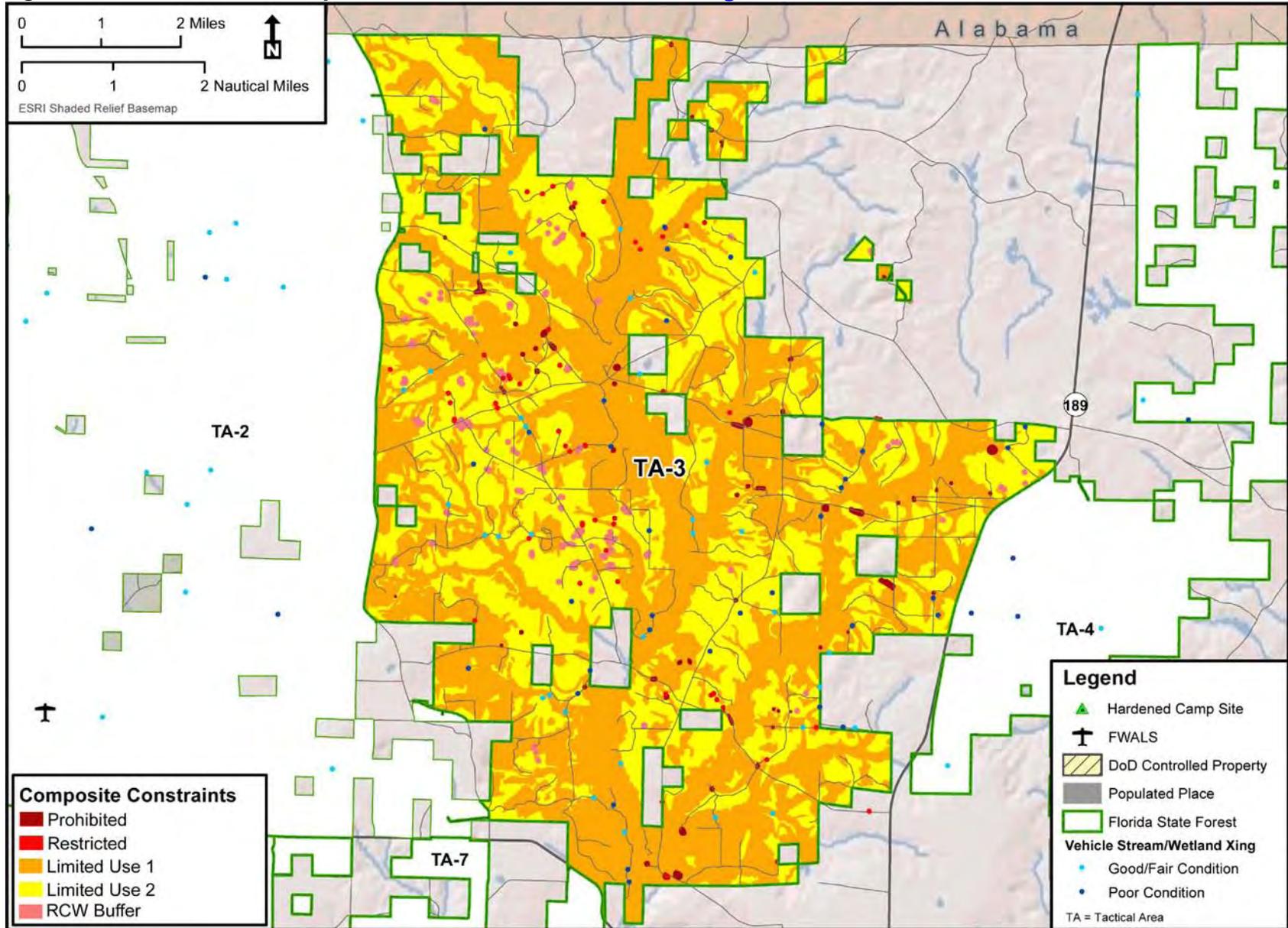


Figure 5-5. BRSF TA-4 Ground Operations Protection Levels (Return to [Figure 5-5](#))

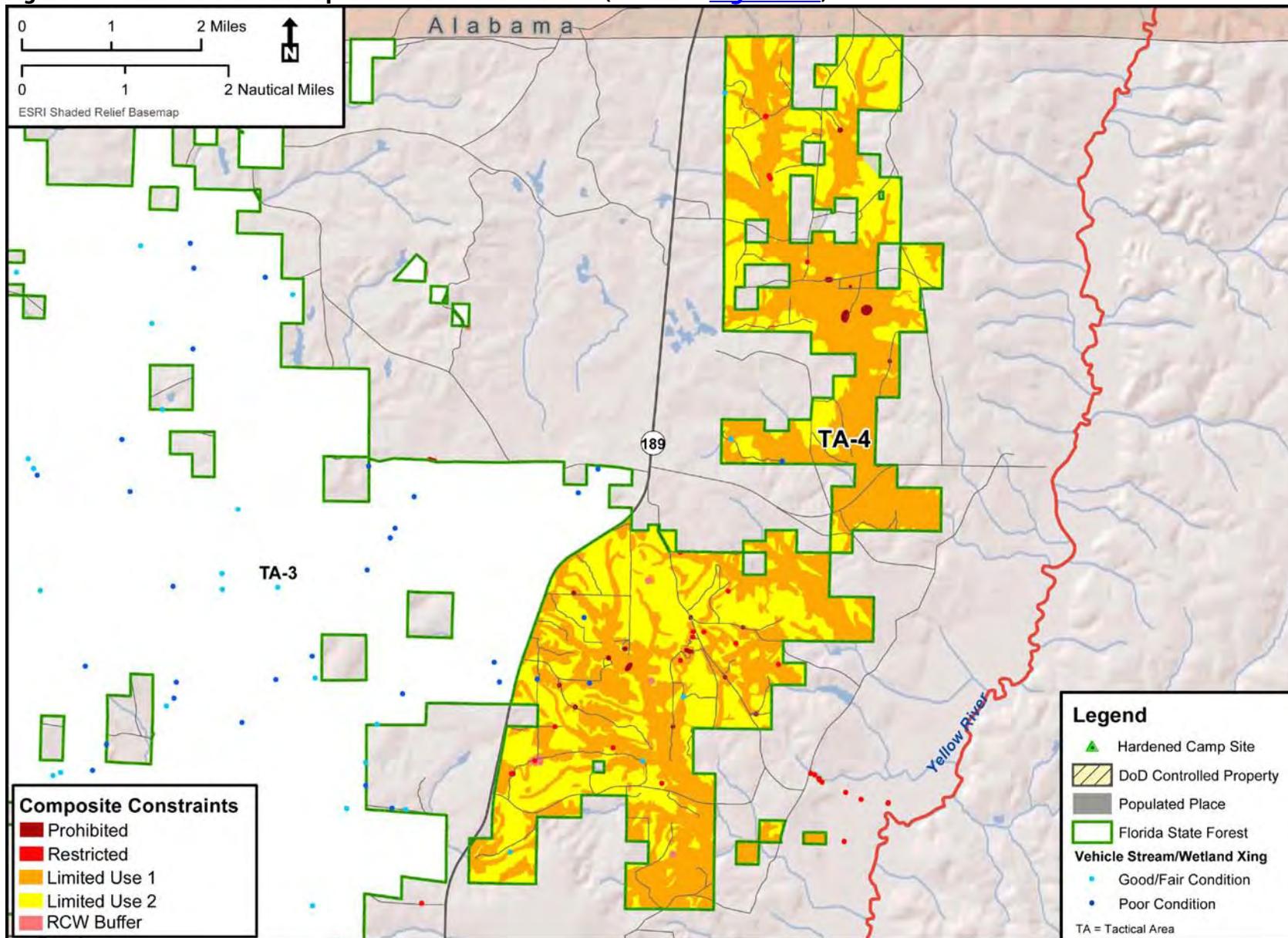


Figure 5-6. BRSF TA-5 Ground Operations Protection Levels (Return to [Figure 5-6](#))

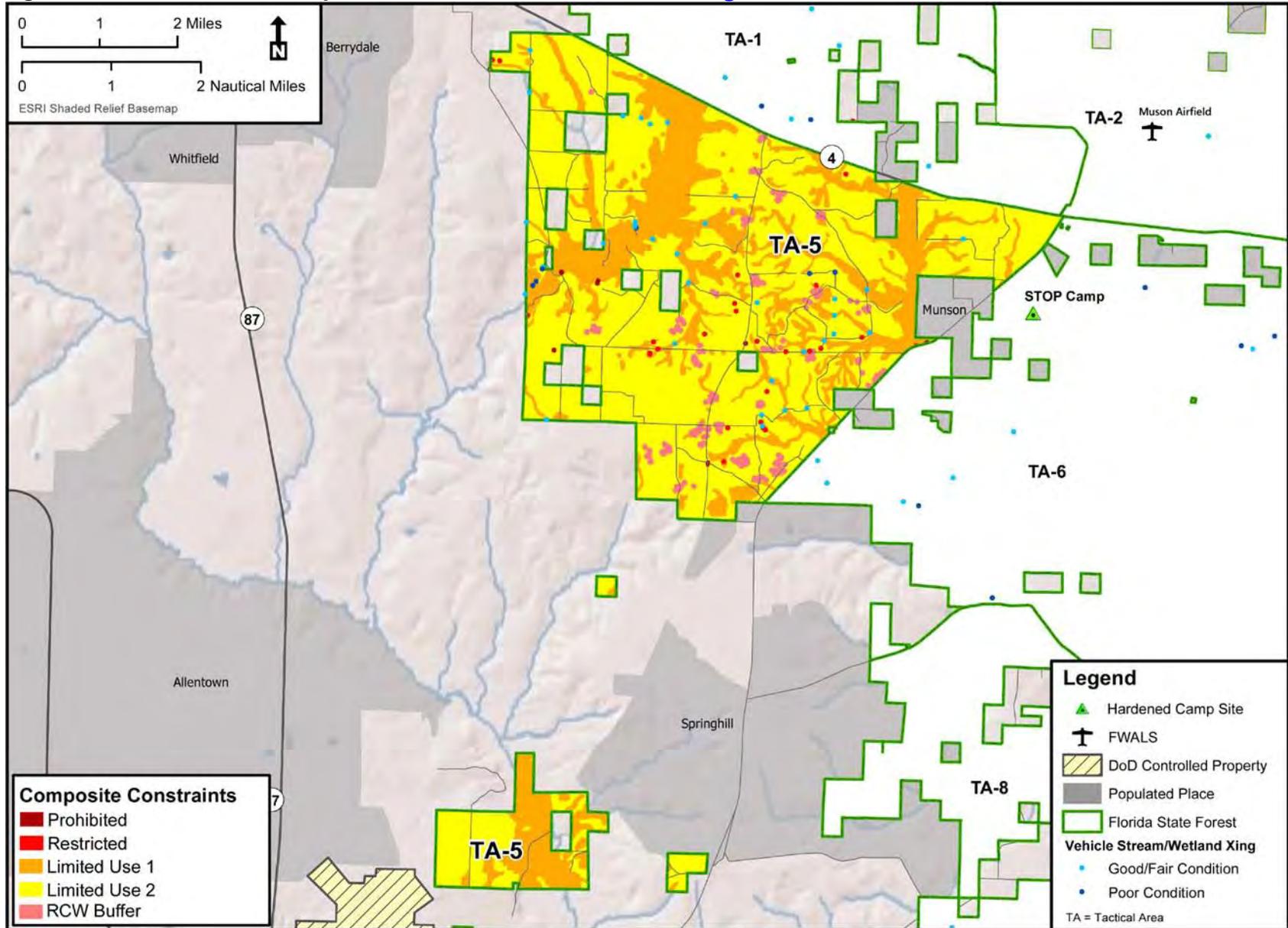


Figure 5-7. BRSF TA-6 Ground Operations Protection Levels (Return to [Figure 5-7](#))

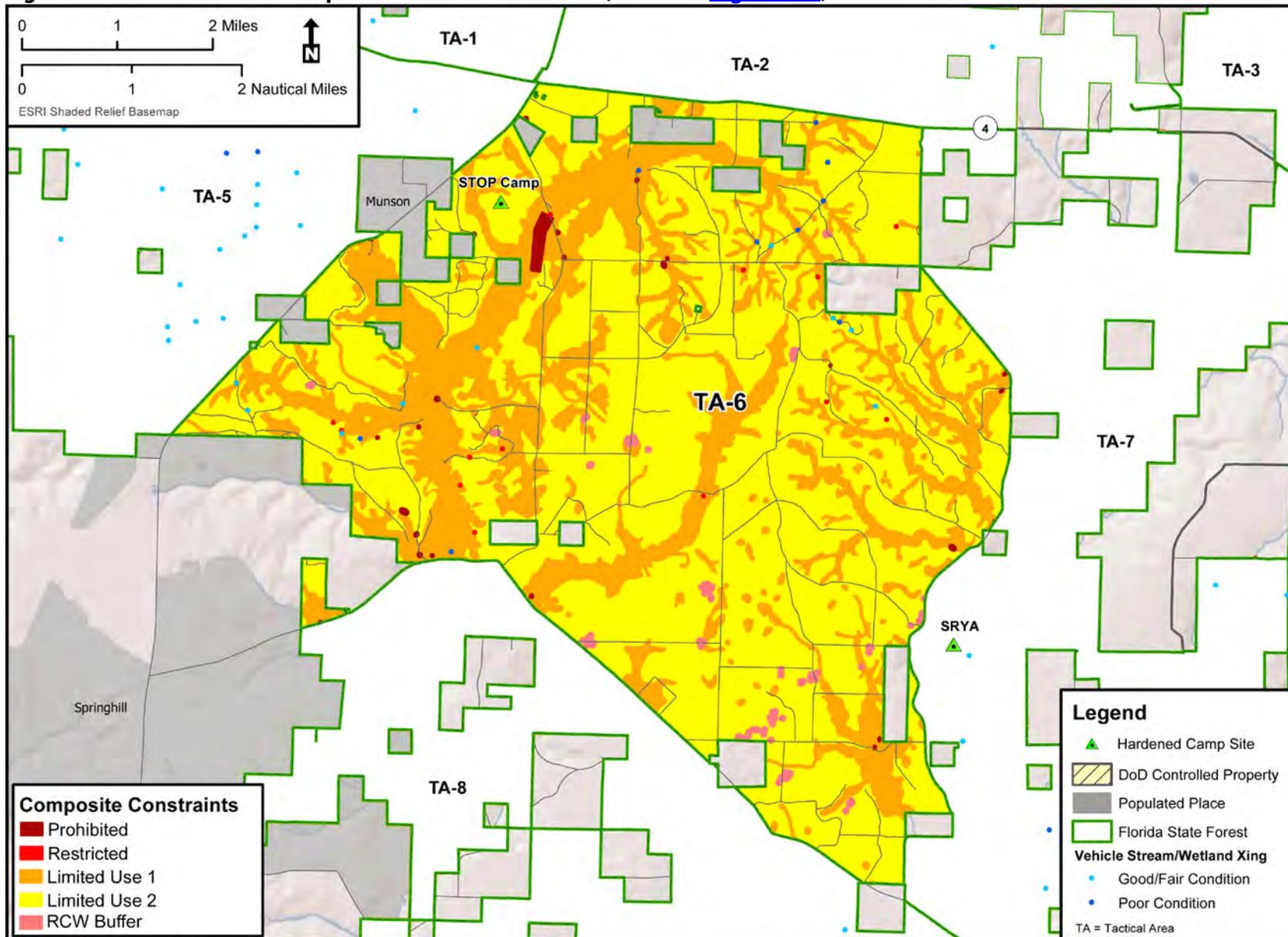


Figure 5-8. BRSF TA-7 Ground Operations Protection Levels (Return to [Figure 5-8](#))

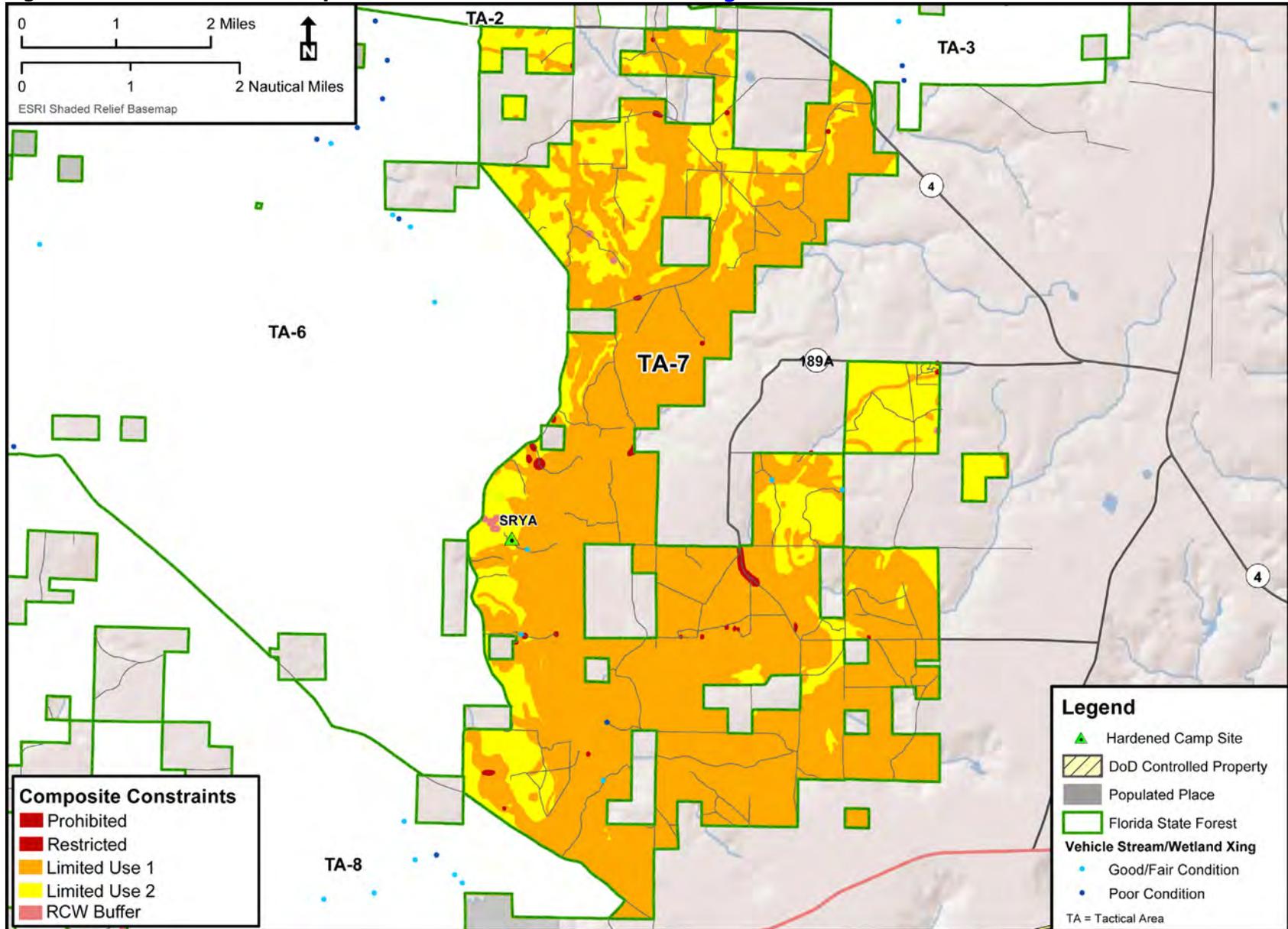


Figure 5-9. BRSF TA-8 Ground Operations Protection Levels (Return to [Figure 5-9](#))

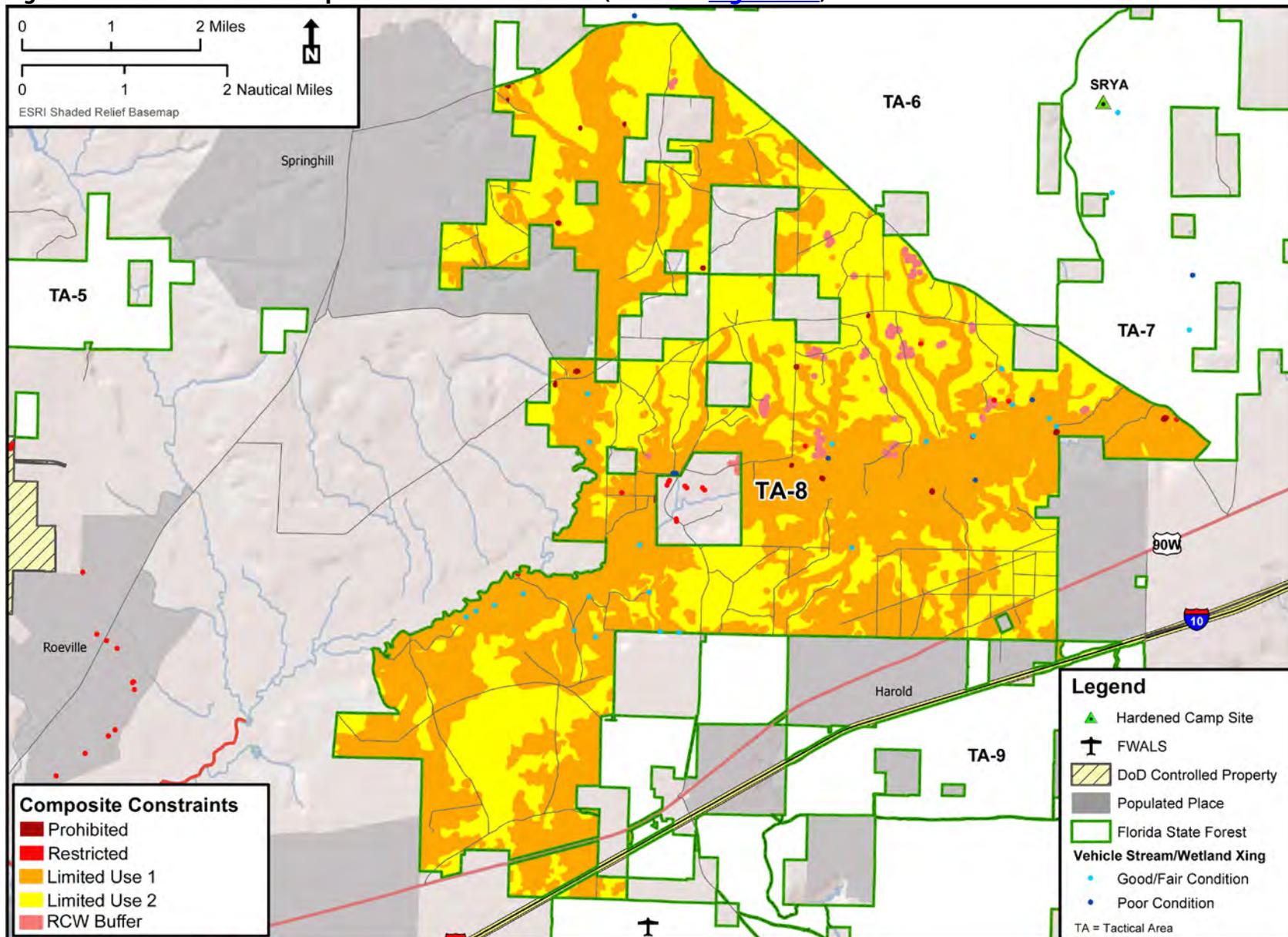


Figure 5-10. BRSF TA-9 Ground Operations Protection Levels (Return to [Figure 5-10](#))

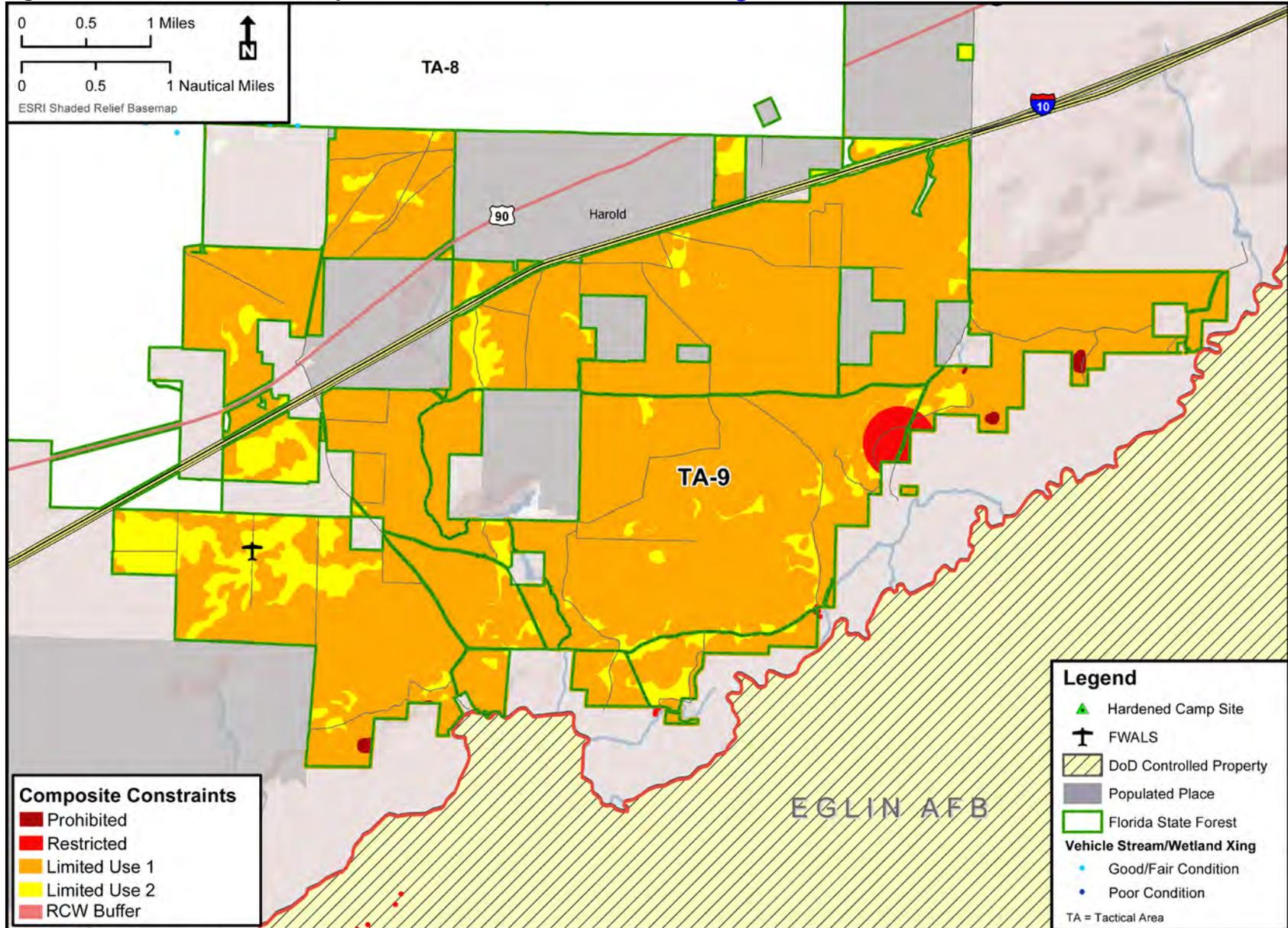


Figure 5-11. BRSF Noise Protection Levels (Return to [Figure 5-11](#))

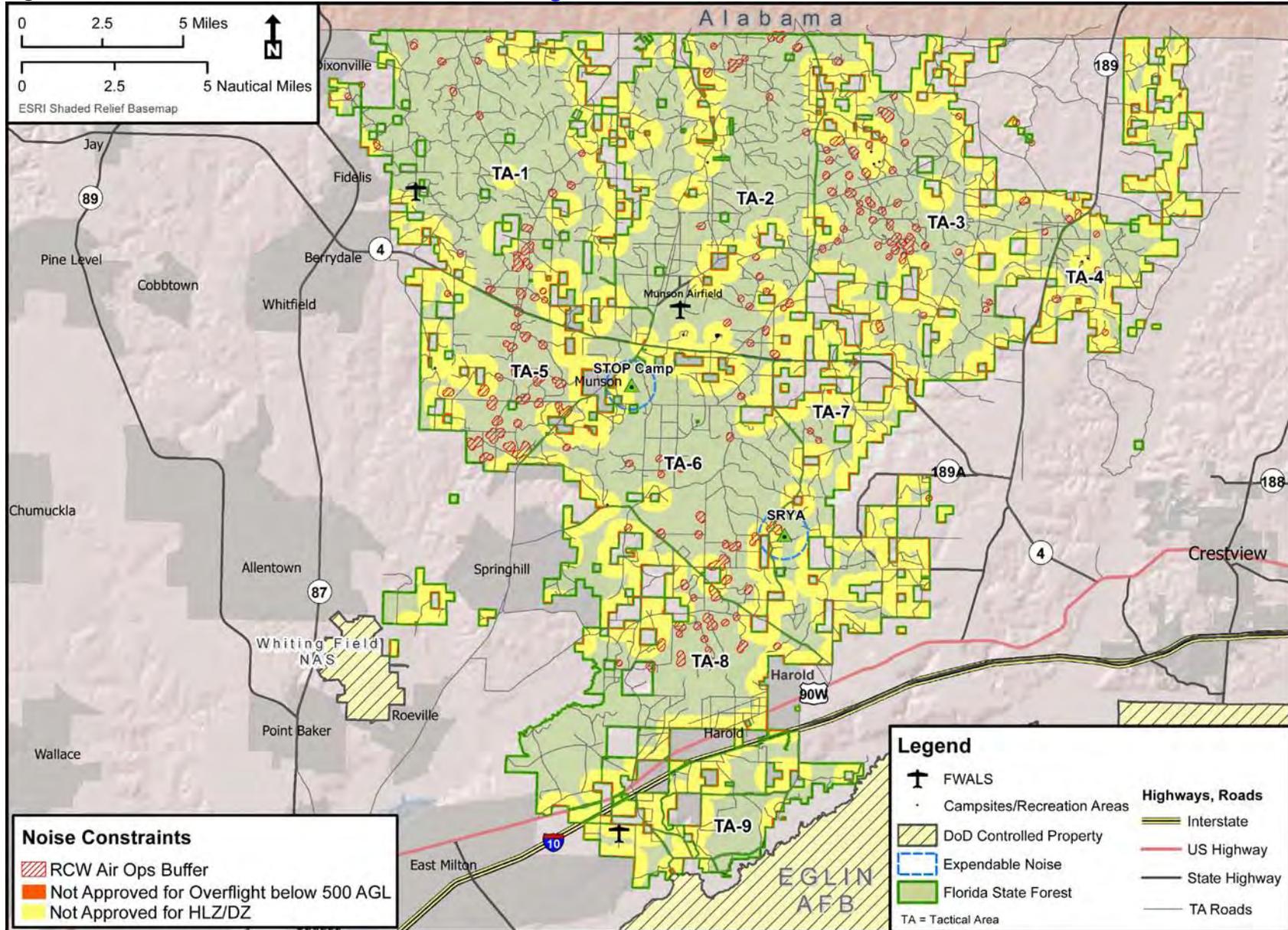
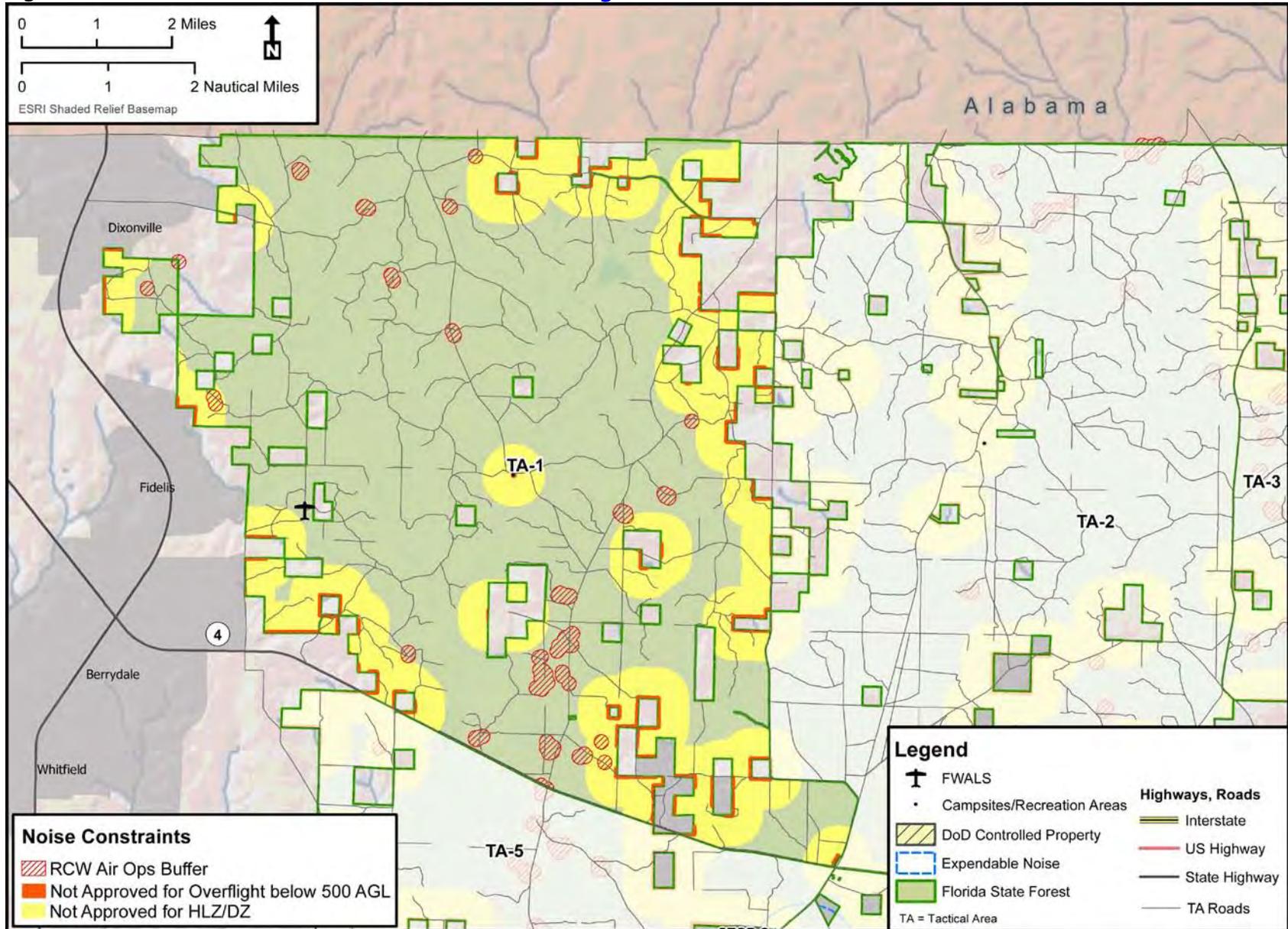


Figure 5-12. BRSF TA-1 Noise Protection Levels (Return to [Figure 5-12](#))



Noise Constraints

- RCW Air Ops Buffer
- Not Approved for Overflight below 500 AGL
- Not Approved for HLZ/DZ

Legend

- FWALS
- Campsites/Recreation Areas
- DoD Controlled Property
- Expendable Noise
- Florida State Forest
- TA = Tactical Area

Highways, Roads

- Interstate
- US Highway
- State Highway
- TA Roads

Figure 5-13. BRSF TA-2 Noise Protection Levels (Return to [Figure 5-13](#))

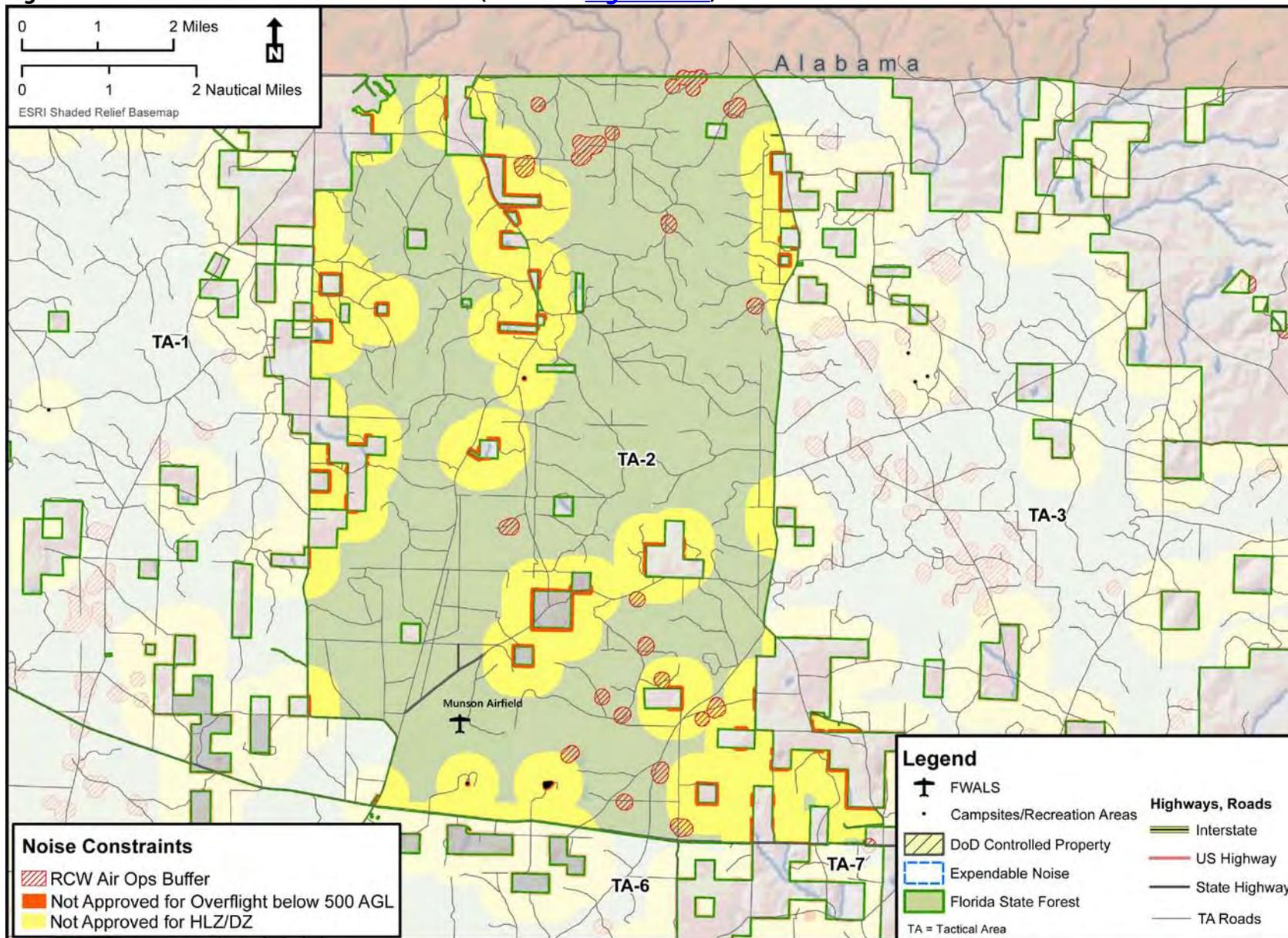


Figure 5-14. BRSF TA-3 Noise Protection Levels (Return to [Figure 5-14](#))

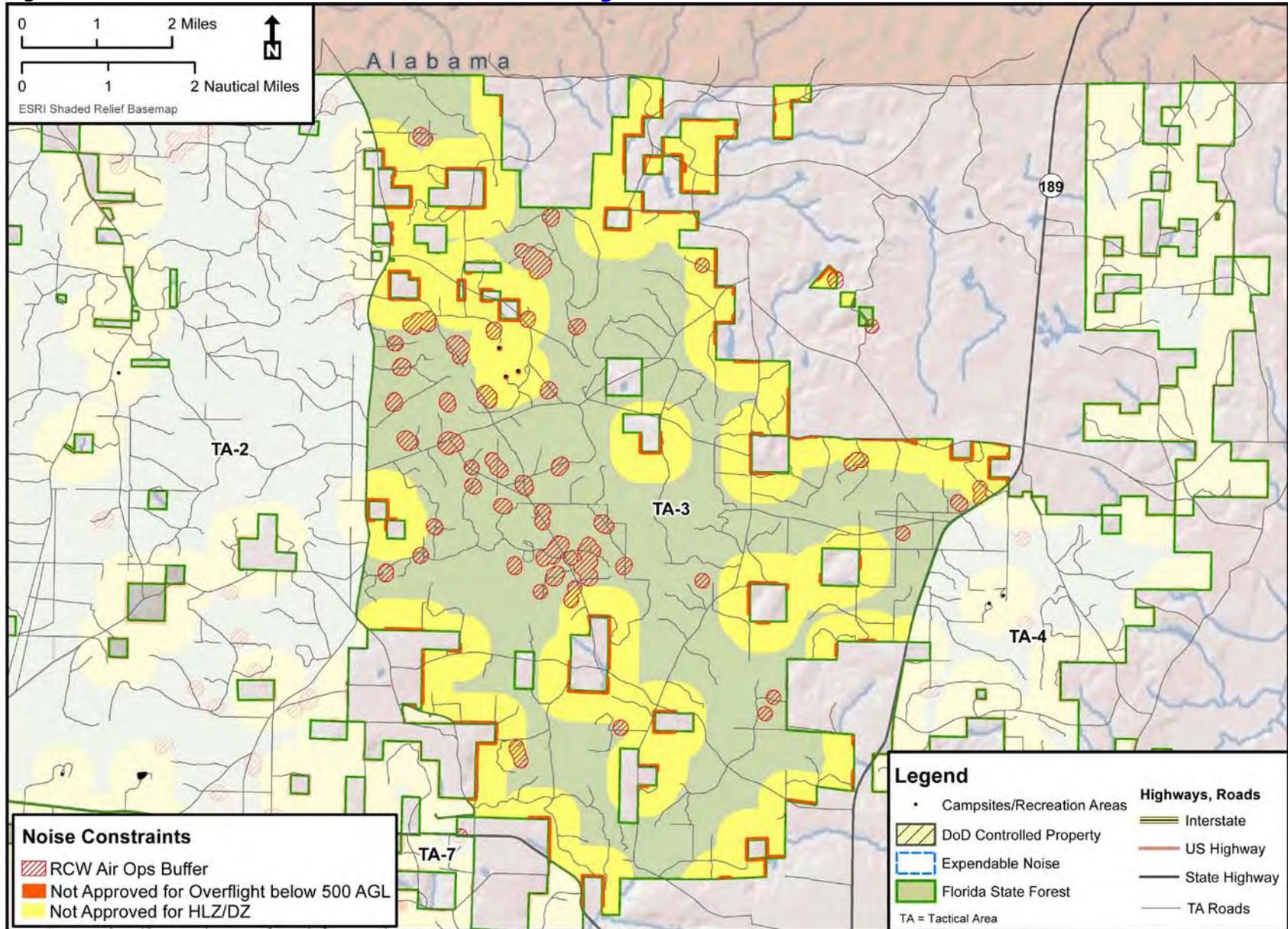


Figure 5-15. BRSF TA-4 Noise Protection Levels (Return to [Figure 5-15](#))

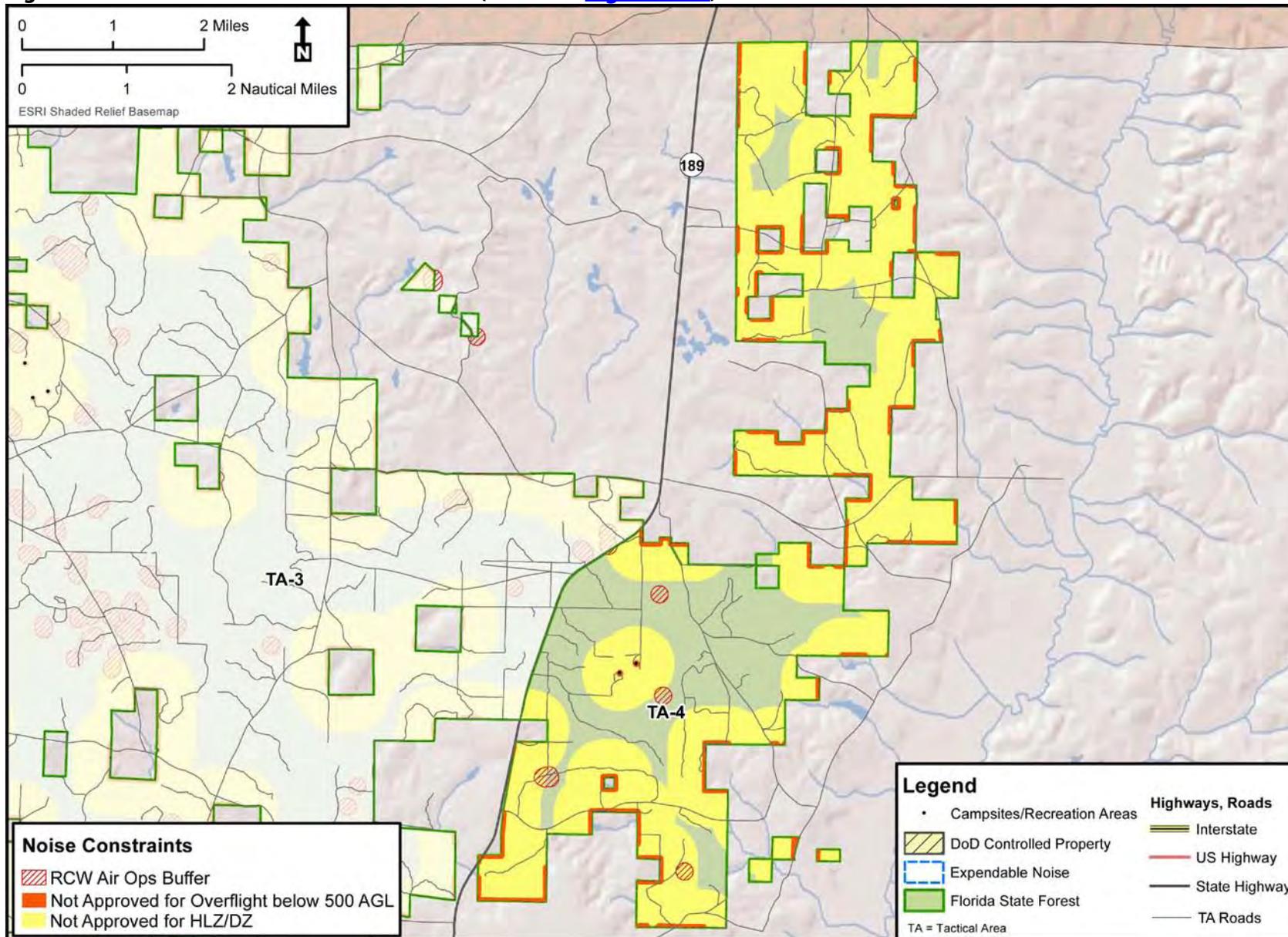


Figure 5-16. BRSF TA-5 Noise Protection Levels (Return to [Figure 5-16](#))

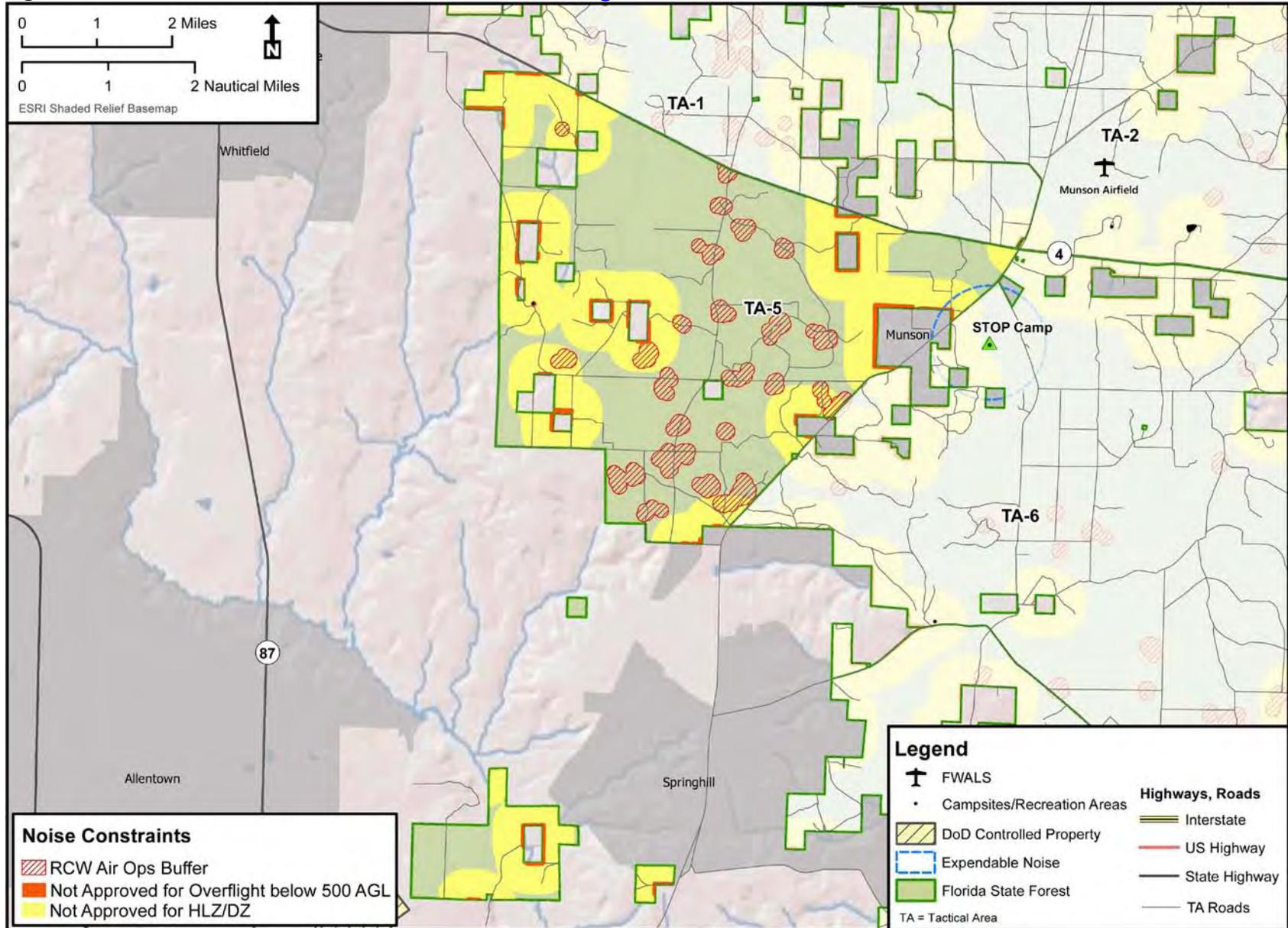


Figure 5-17. BRSF TA-6 Noise Protection Levels (Return to [Figure 5-17](#))

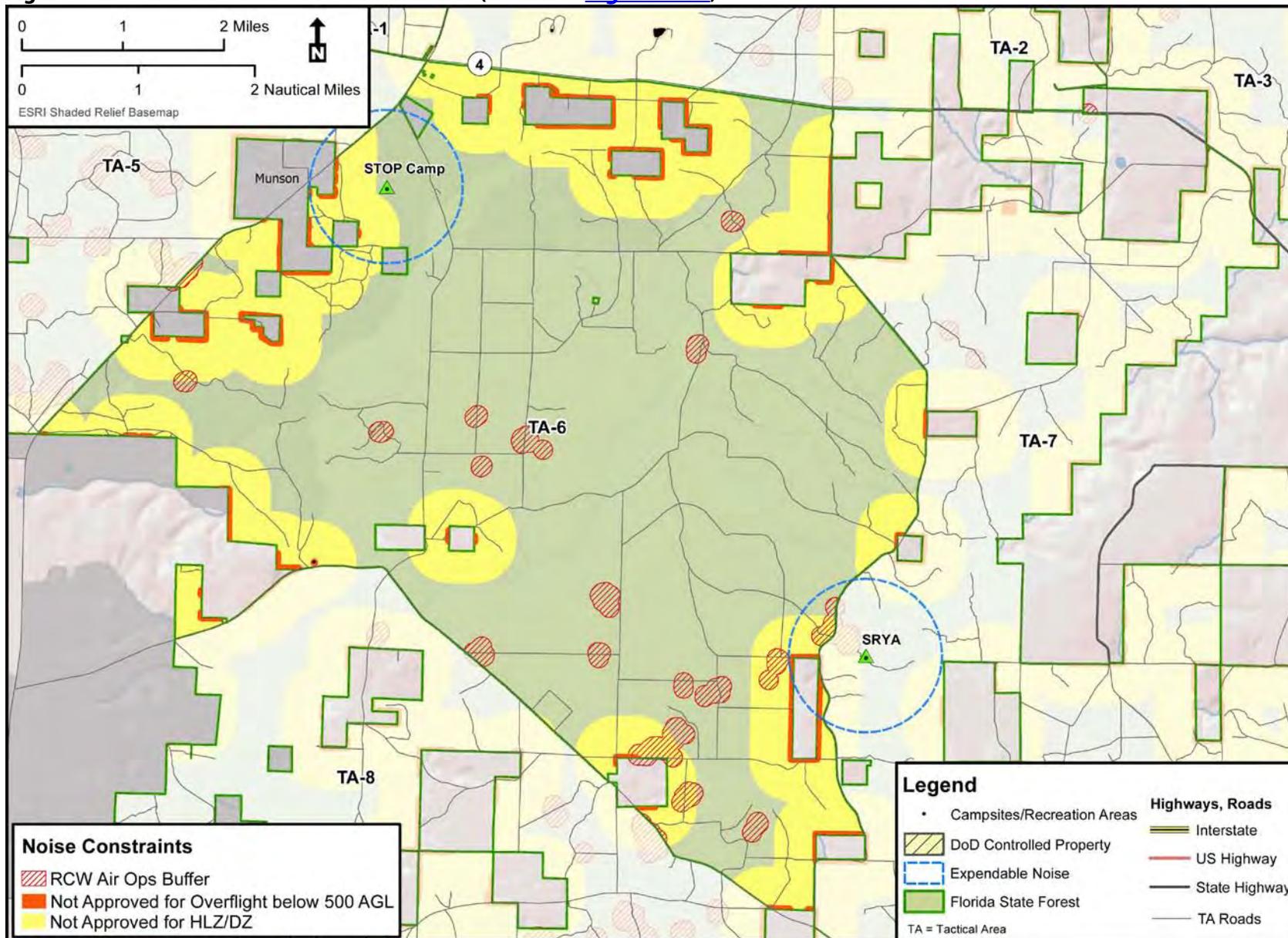


Figure 5-18. BRSF TA-7 Noise Protection Levels (Return to [Figure 5-18](#))

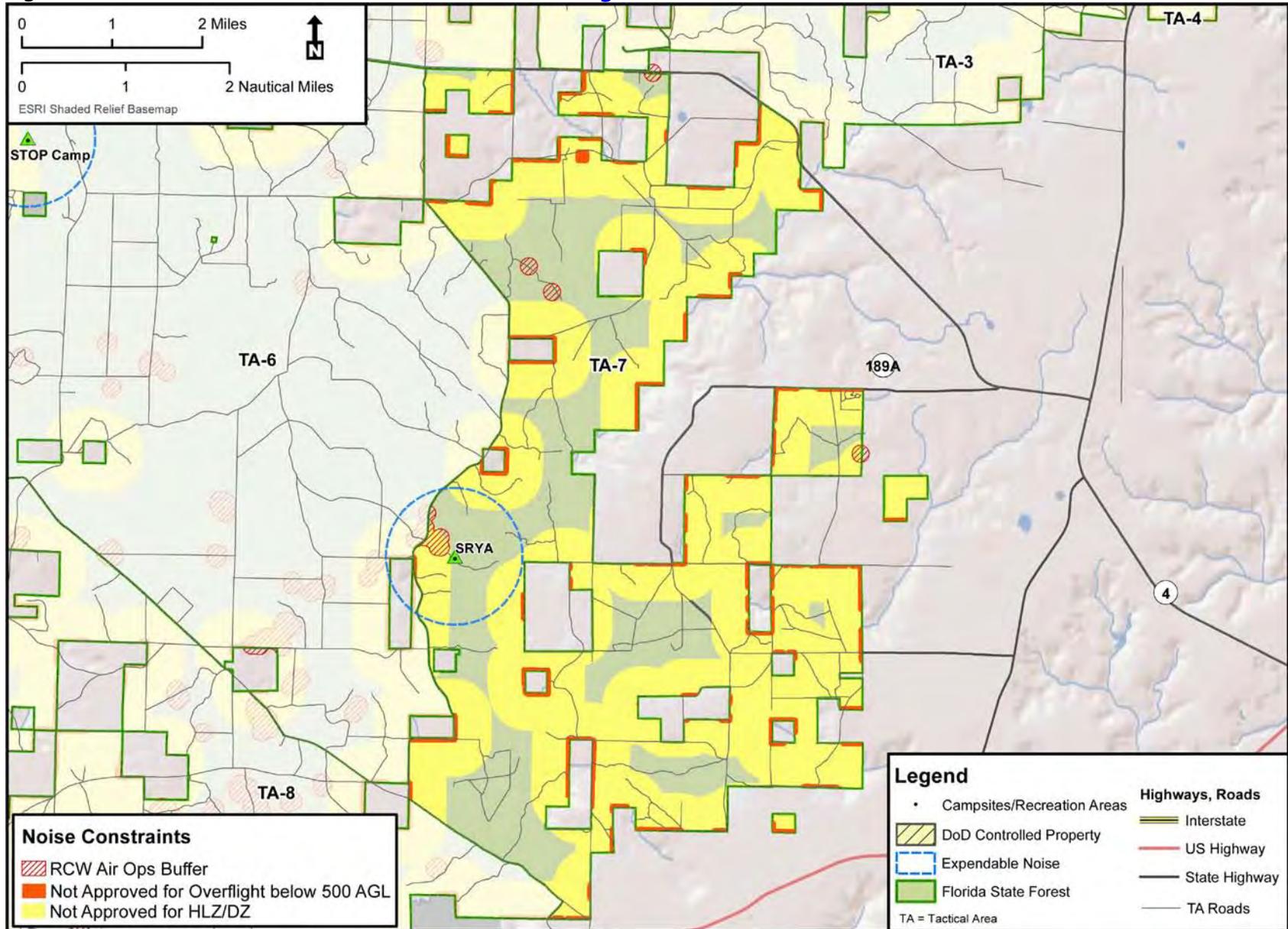


Figure 5-19. BRSF TA-8 Noise Protection Levels (Return to [Figure 5-19](#))

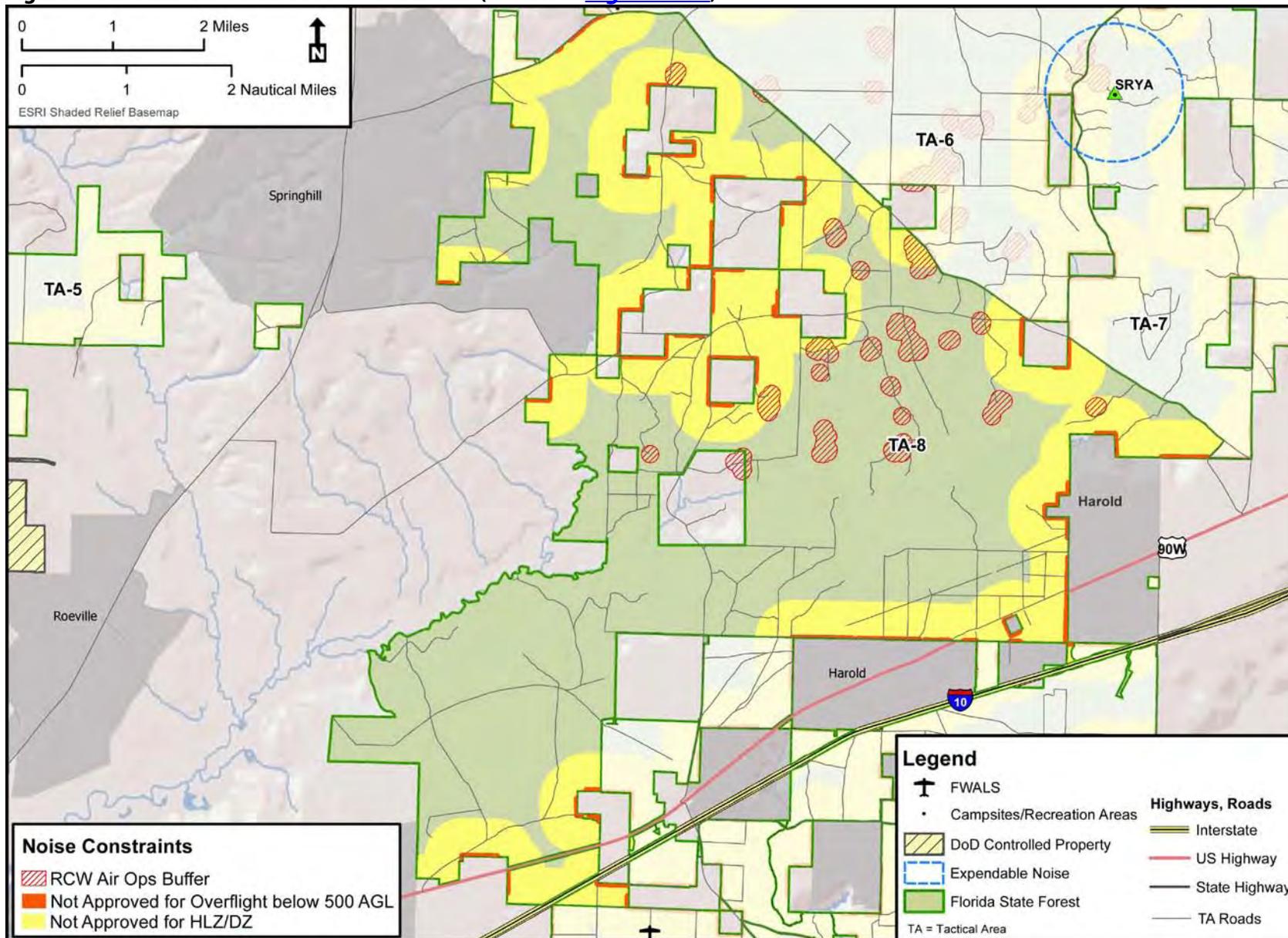


Figure 5-20. BRSF TA-9 Noise Protection Levels (Return to [Figure 5-20](#))

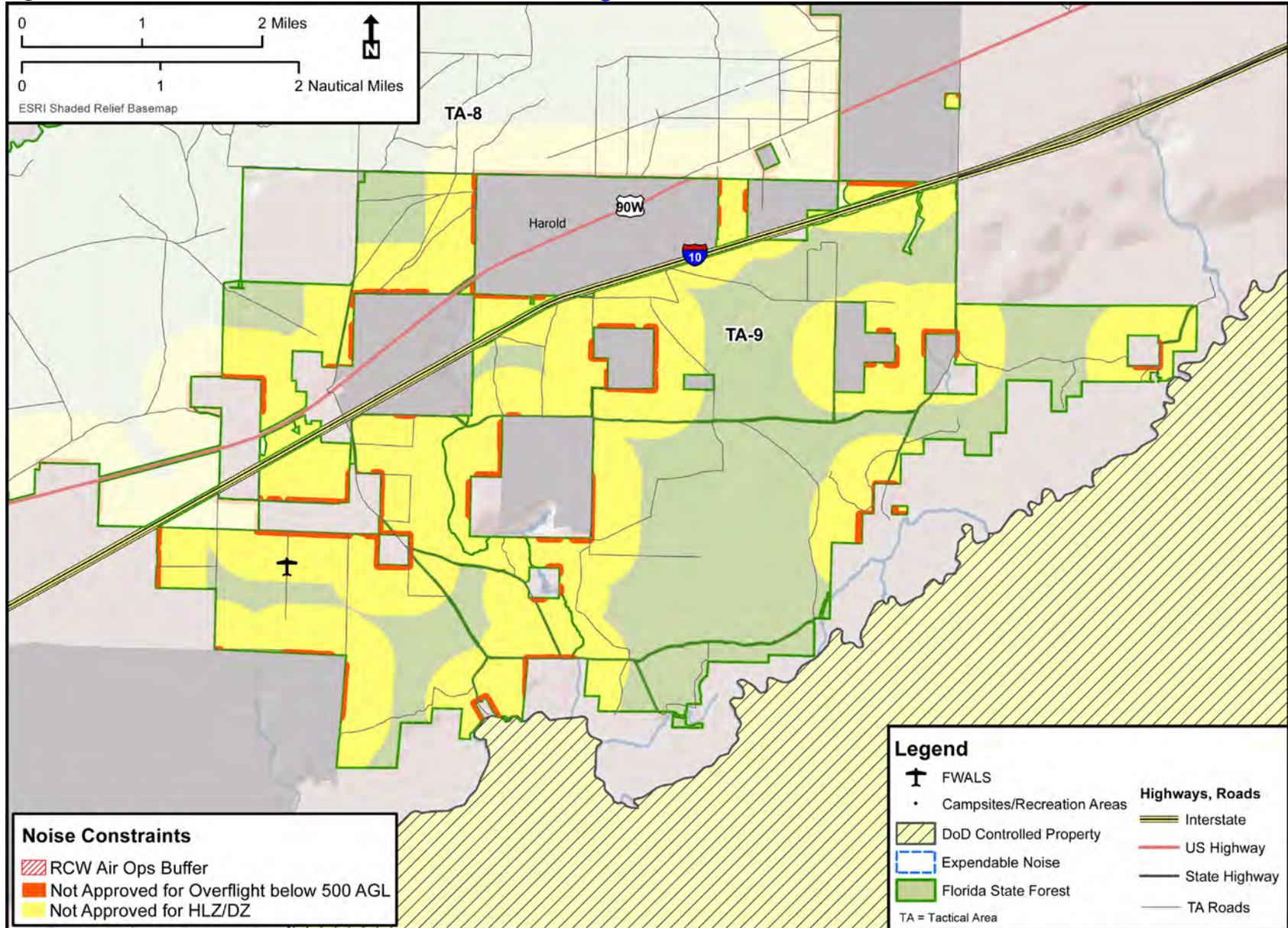
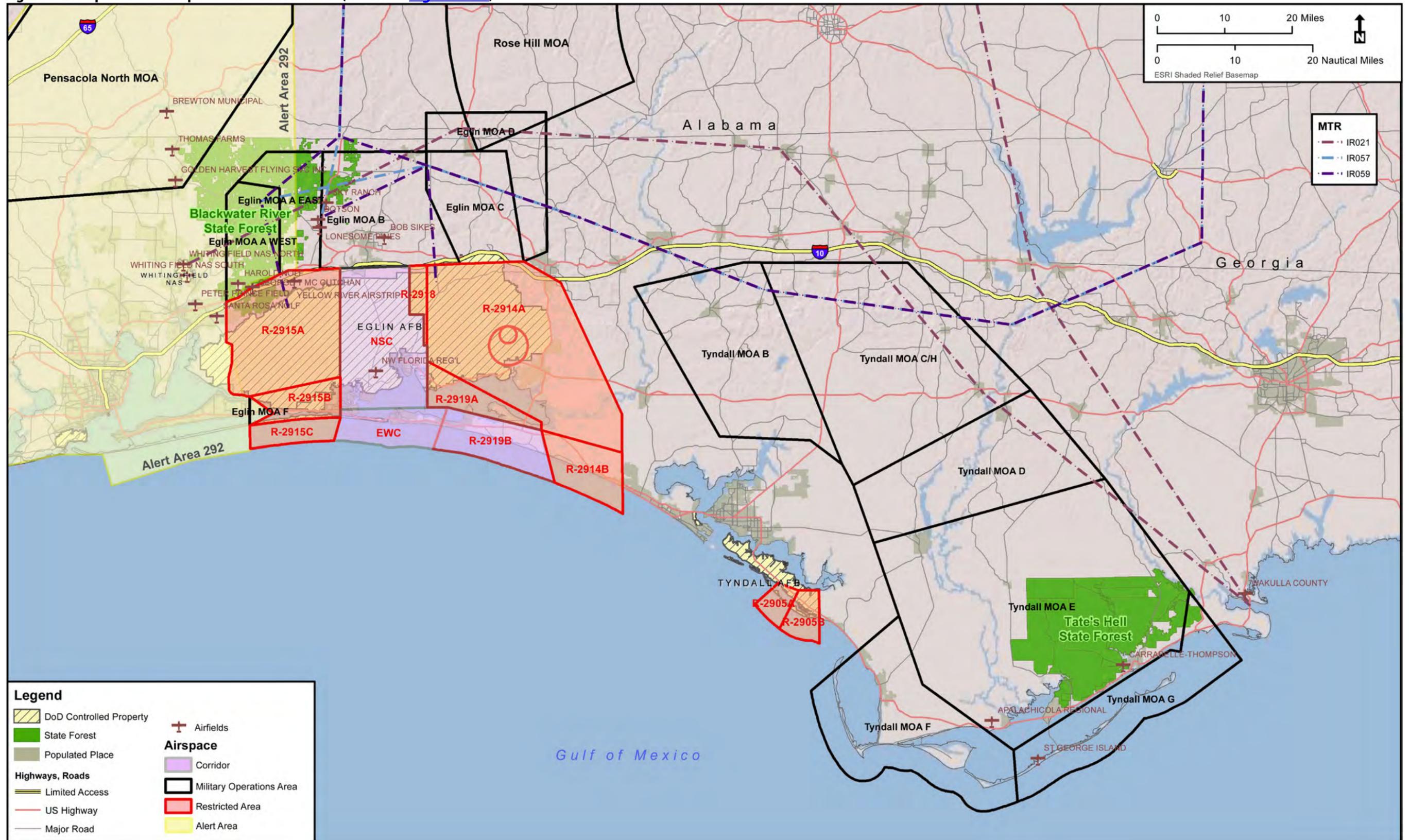


Figure 5-21. Special Use Airspace Units and Airfields (Return to [Figure 5-21](#))



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Figure 5-22. BRSF Proposed FWALS DNL-Munson Airfield (Return to [Figure 5-22](#))

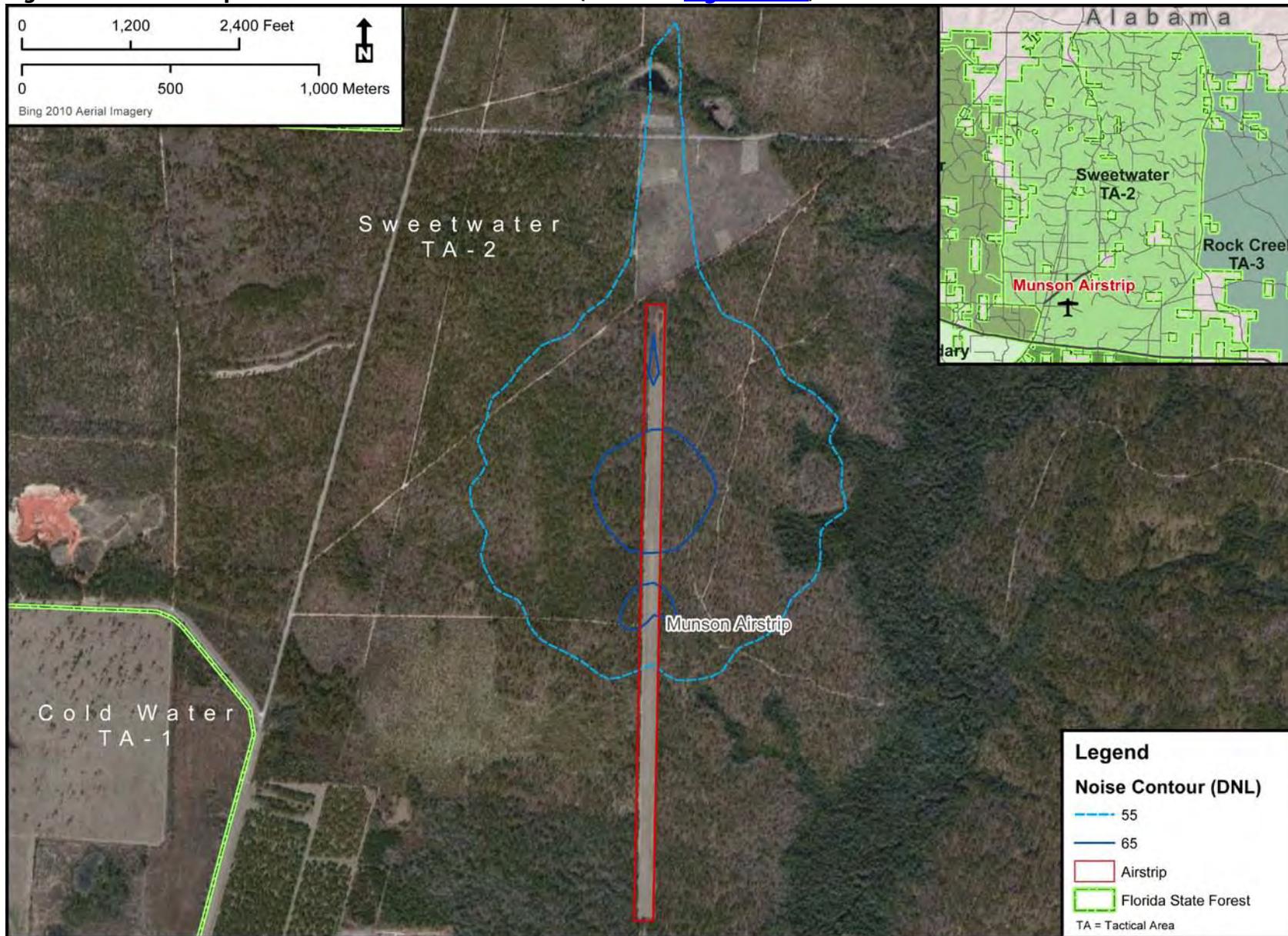


Figure 5-23. BRSF Proposed FWALS DNL-TA-9 Airfield (Return to [Figure 5-23](#))

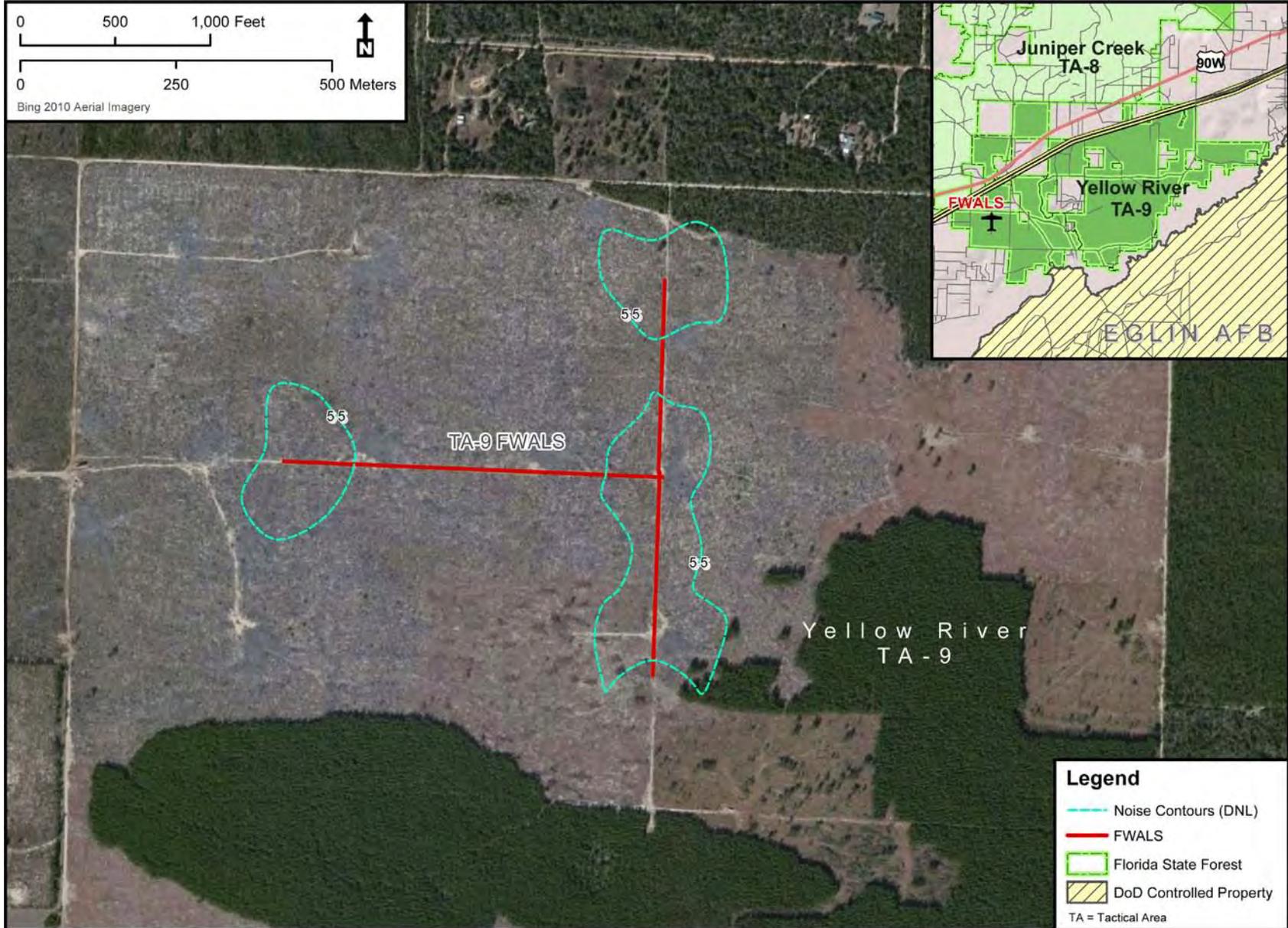


Figure 5-24. BRSF Proposed FWALS DNL-TA-1 Airfield (Return to [Figure 5-24](#))

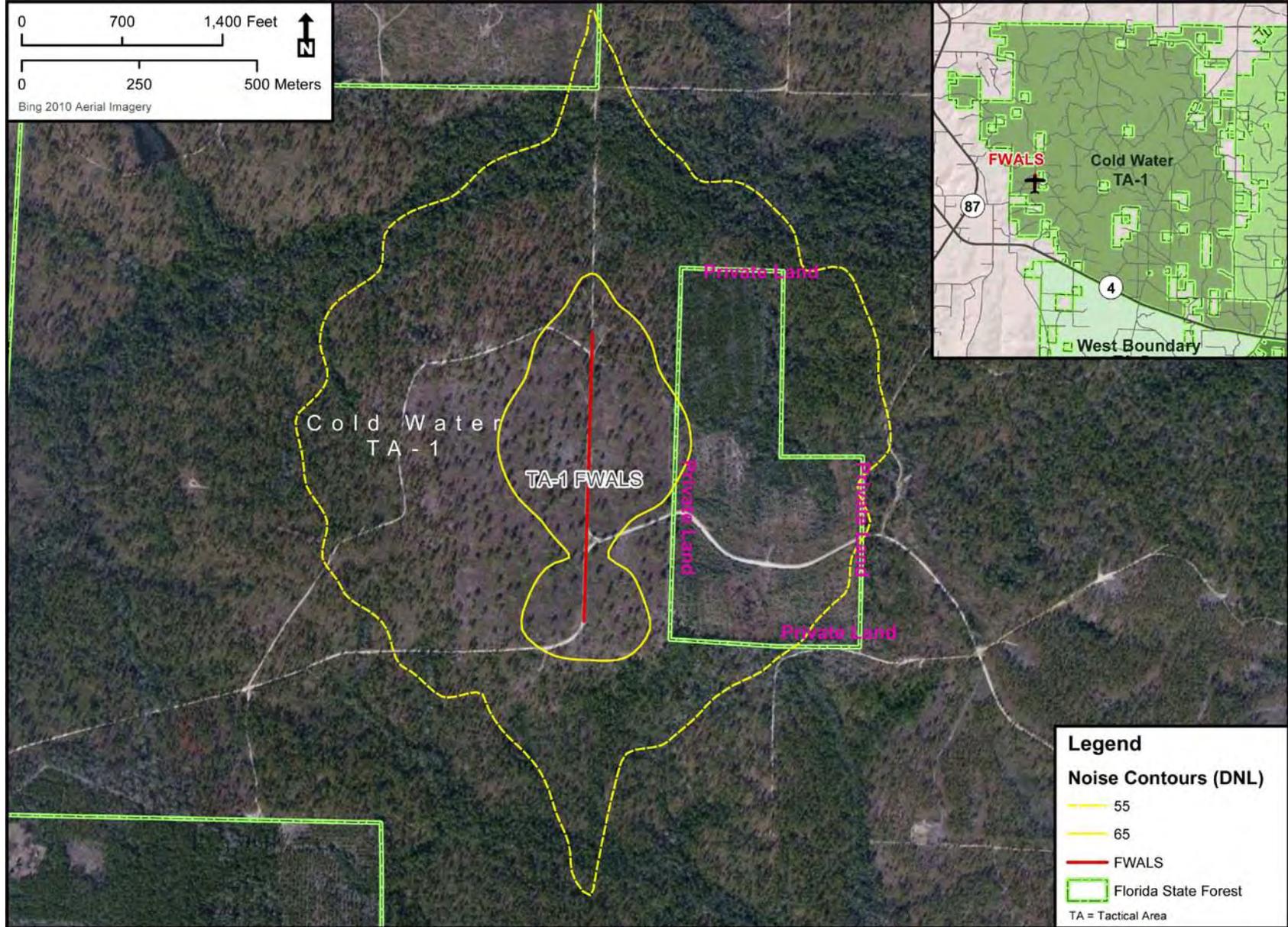


Figure 5-25. BRSF Closed Depressions, Steepheads, and Borrow Pits (Return to [Figure 5-25](#))

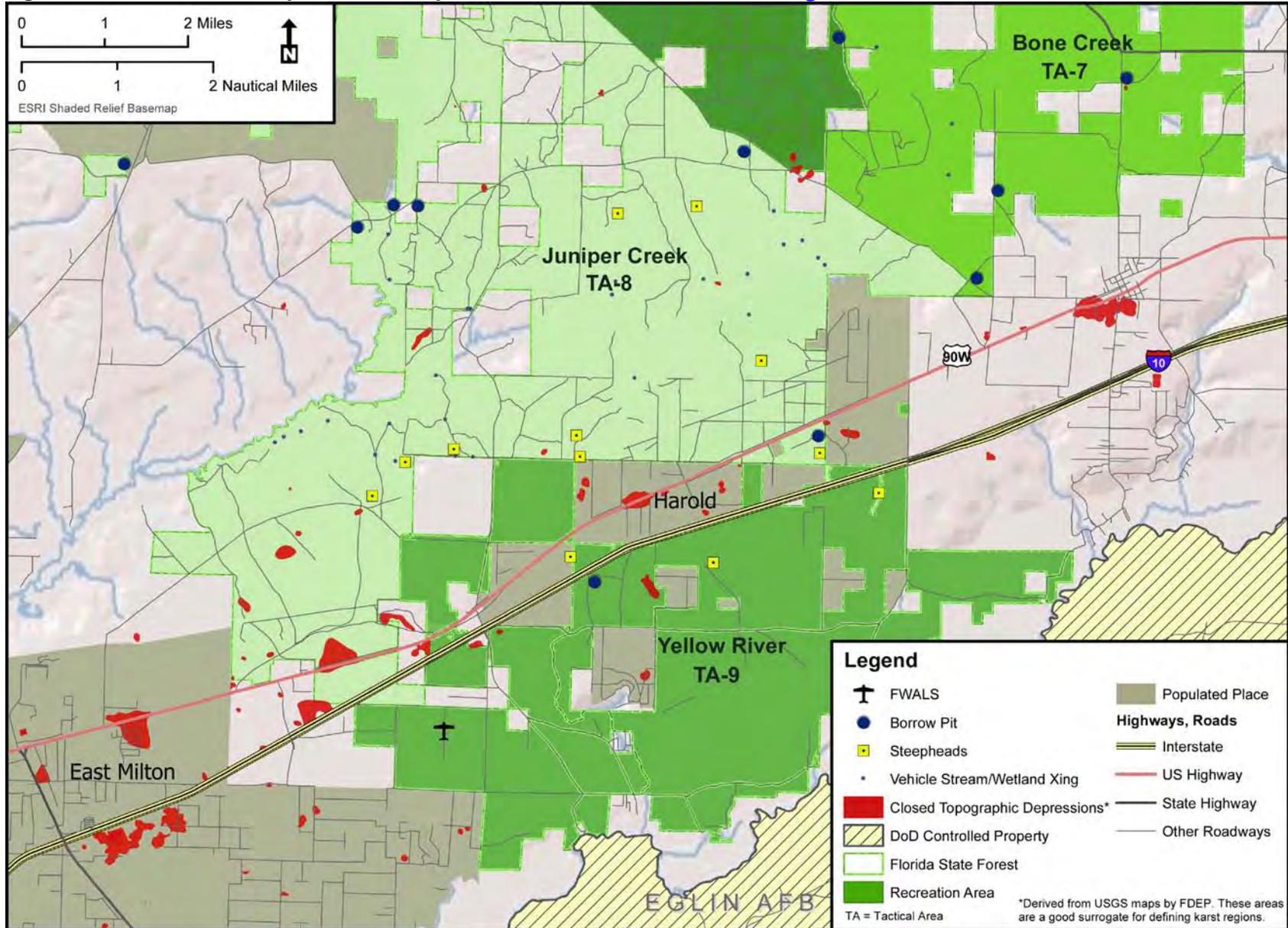


Figure 5-26. BRSF Soil Suborders (Return to [Figure 5-26](#))

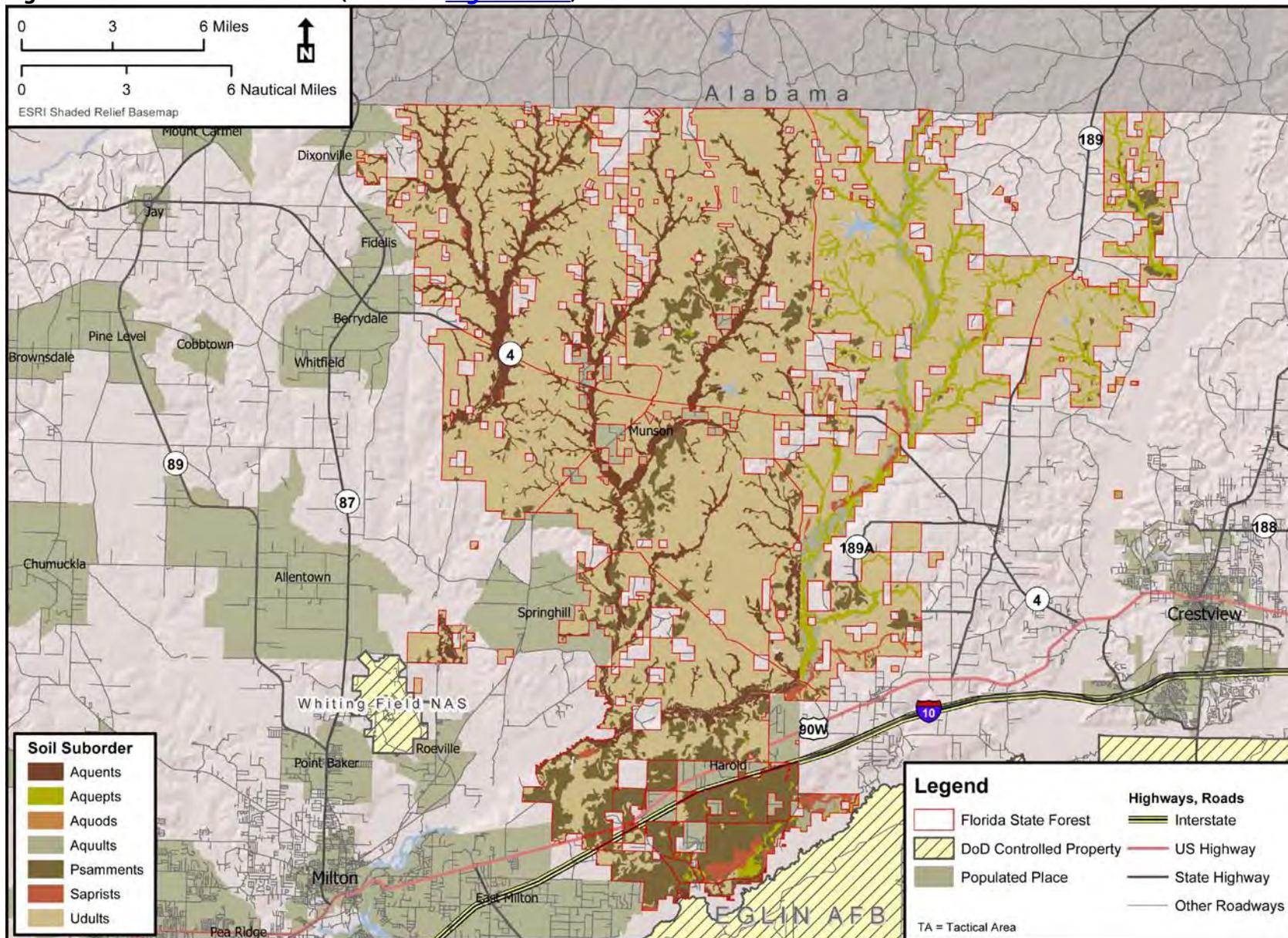


Figure 5-28. BRSF Highly Erodible and Potentially Highly Erodible Soils (Return to [Figure 5-28](#))

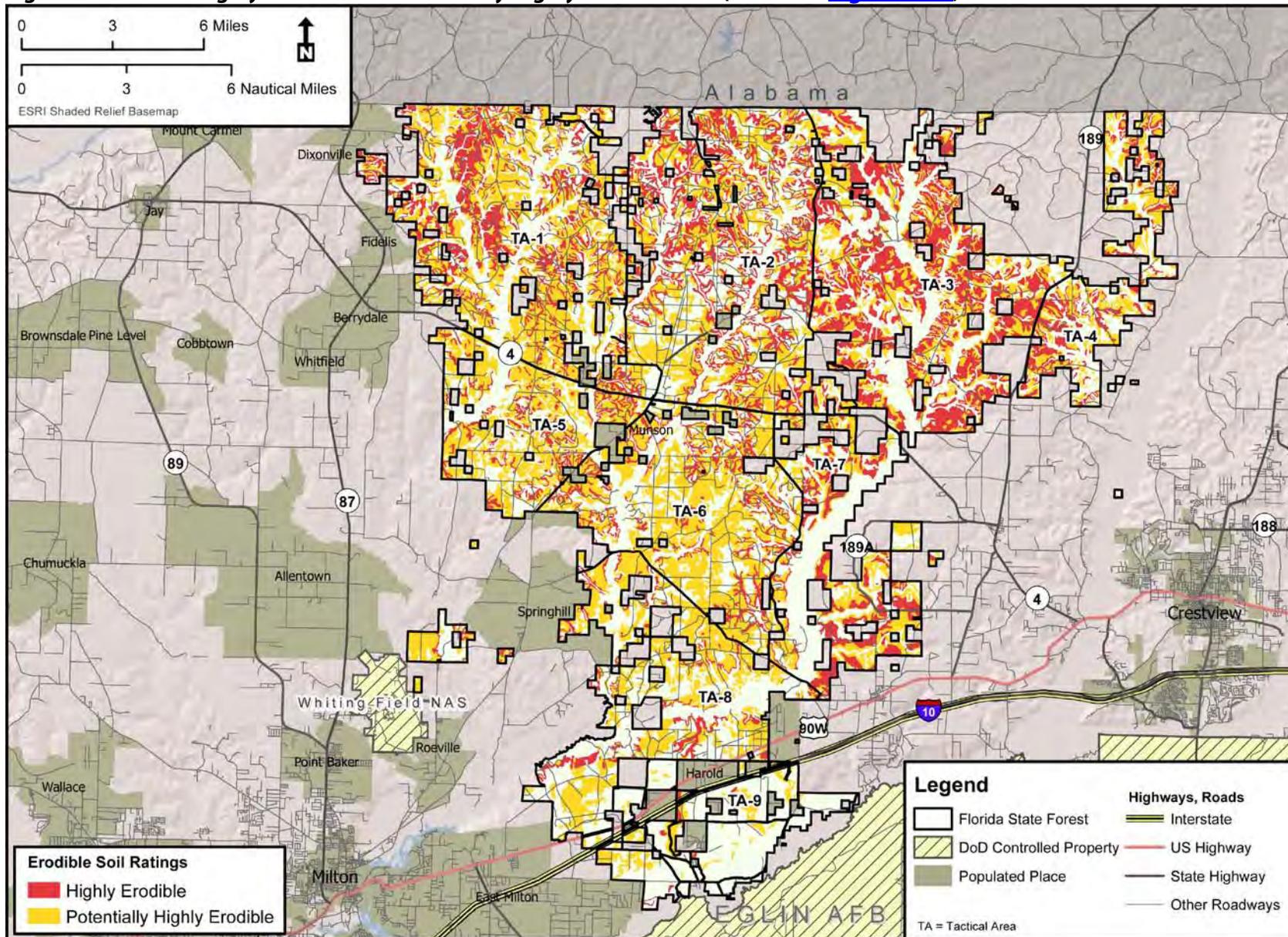


Figure 5-29. BRSF Bivouac Constraint Areas (Return to [Figure 5-29](#))

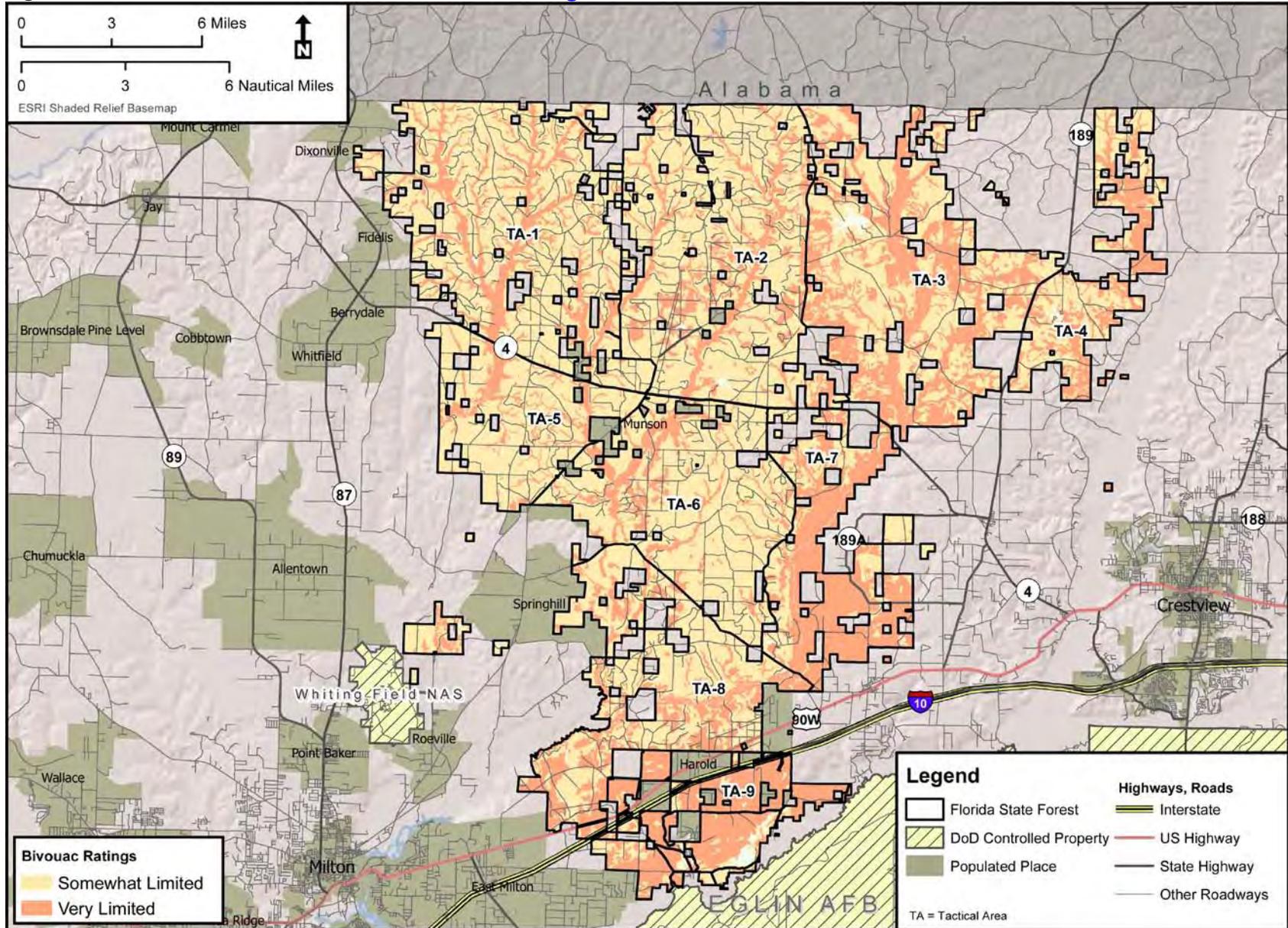


Figure 5-30. BRSF Helicopter Landing Zone Constraint Areas (Return to [Figure 5-30](#))

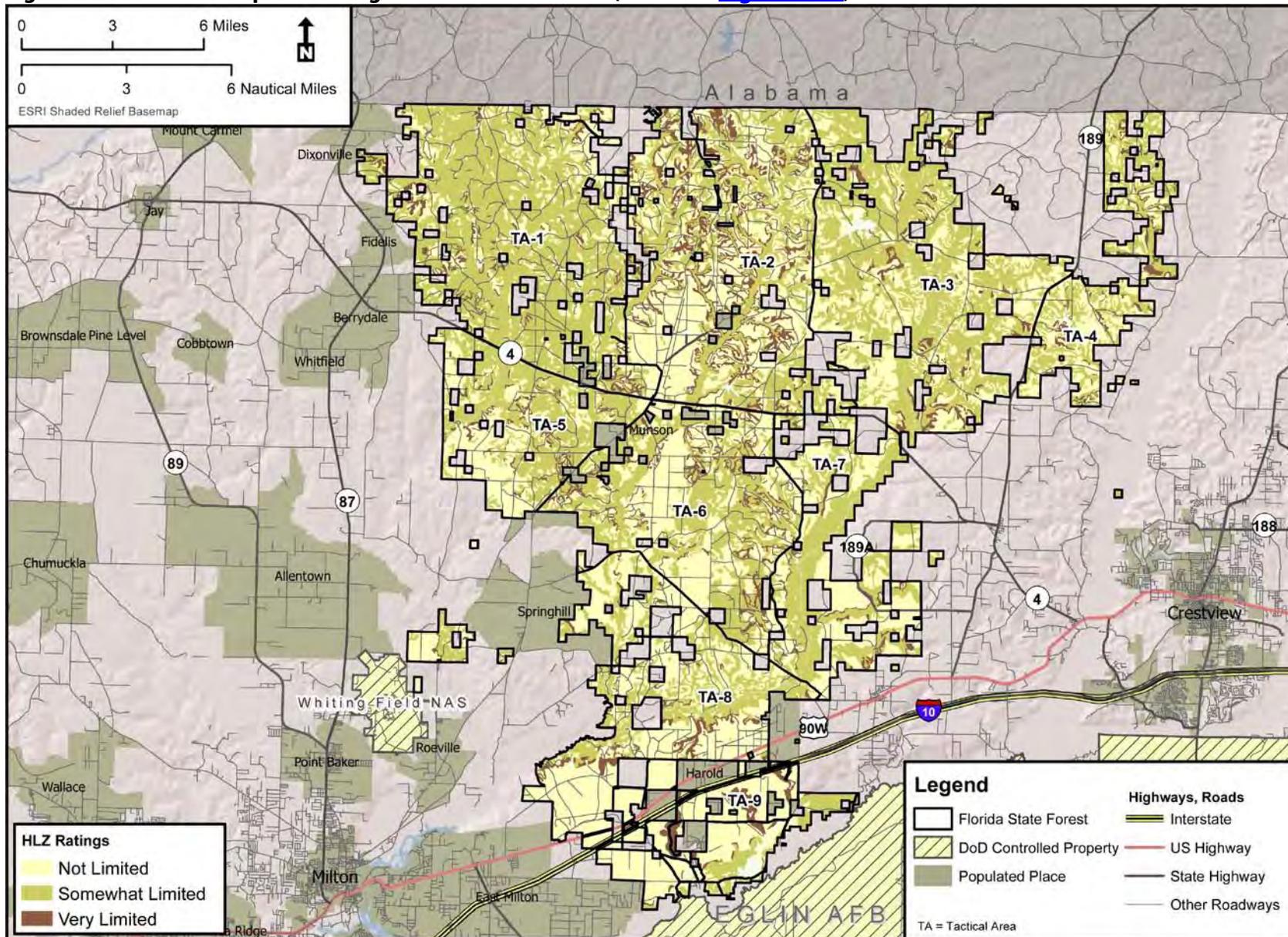


Figure 5-31. Water and Biological Resources at BRSF – Overview (Return to [Figure 5-31](#))

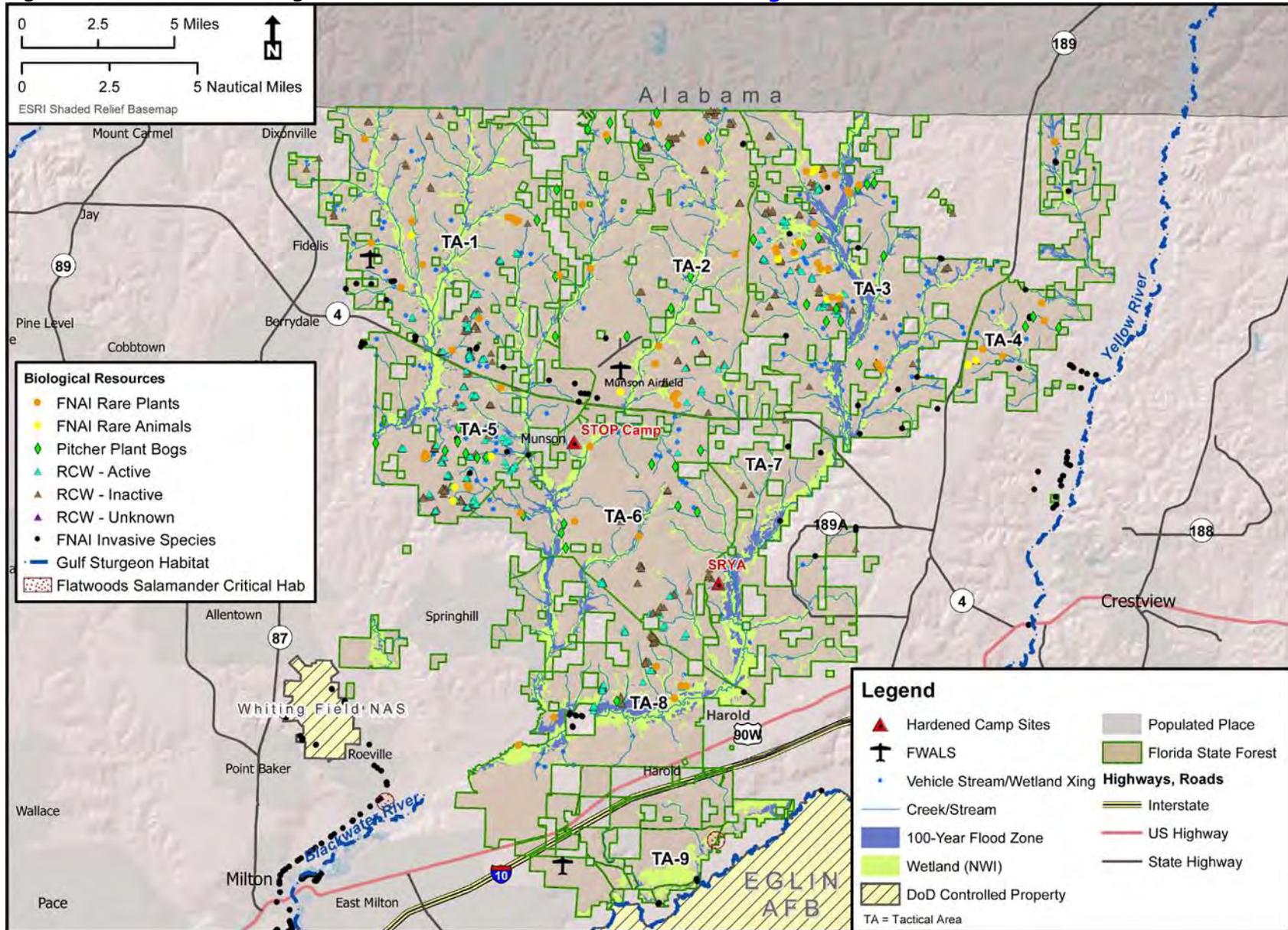


Figure 5-32. Water and Biological Resources – TA-1 at BRSF (Return to [Figure 5-32](#))

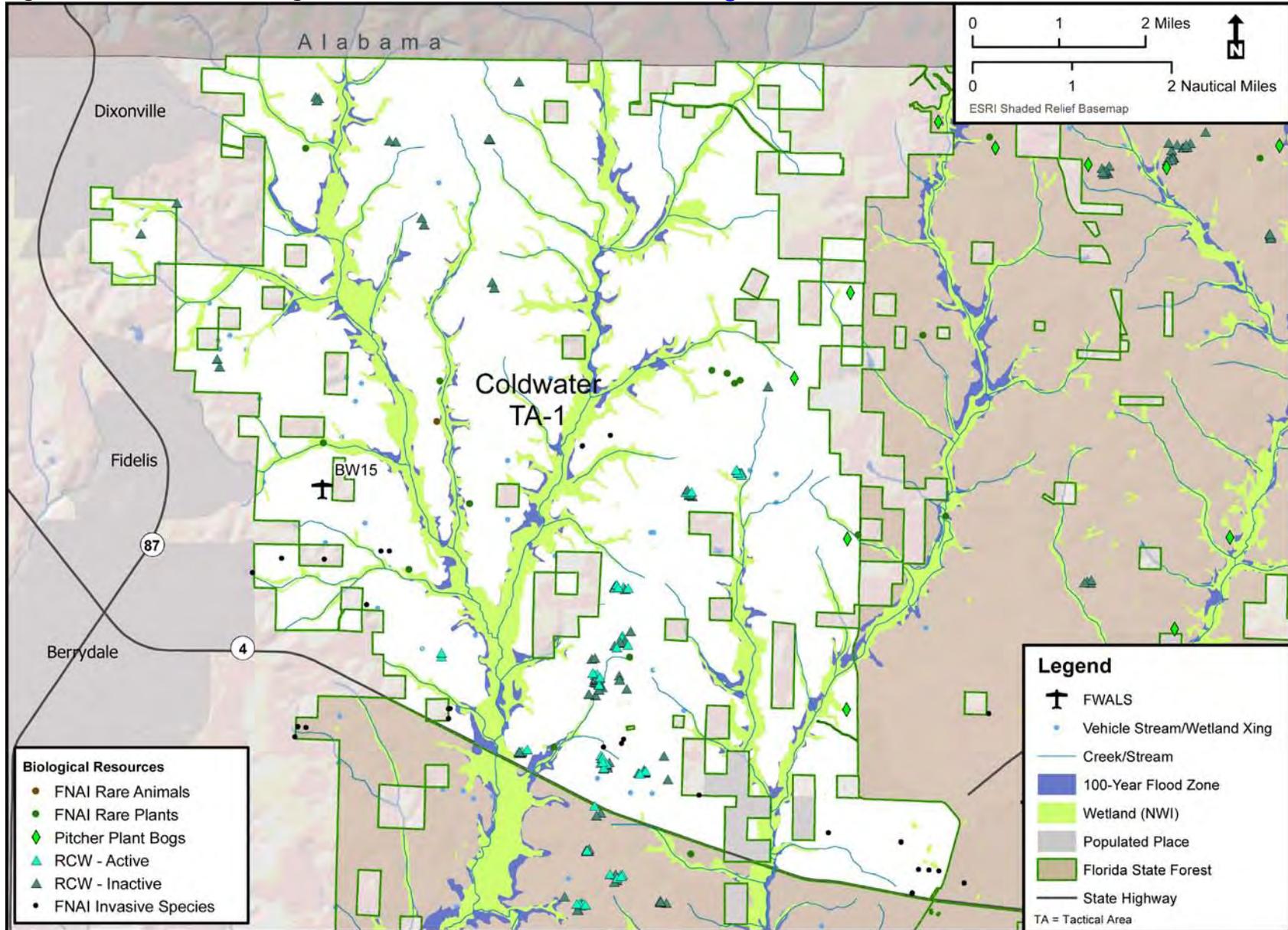


Figure 5-33. Water and Biological Resources – TA-2 at BRSF (Return to [Figure 5-33](#))

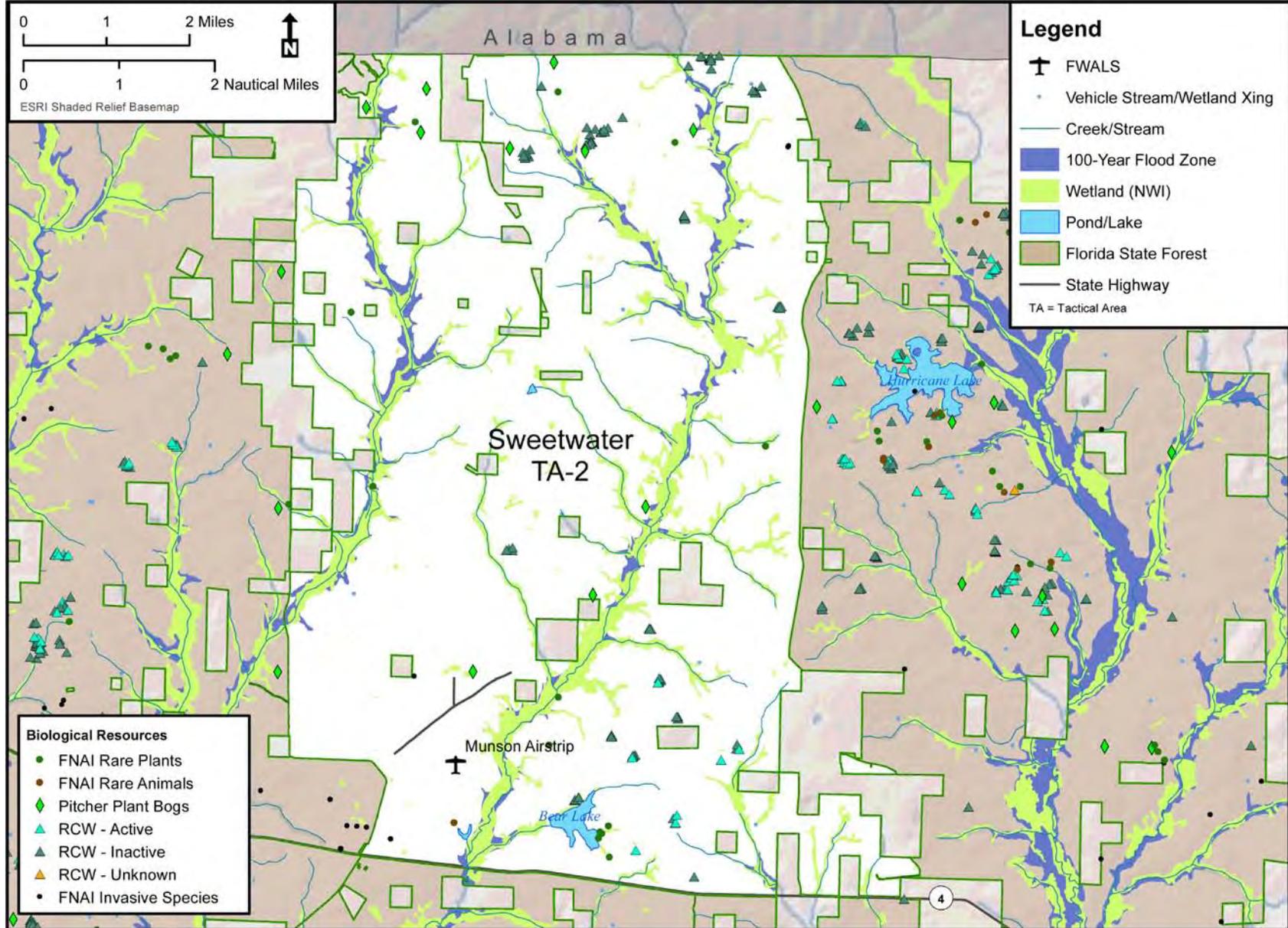


Figure 5-34. Water and Biological Resources – TA-3 at BRSF (Return to [Figure 5-34](#))

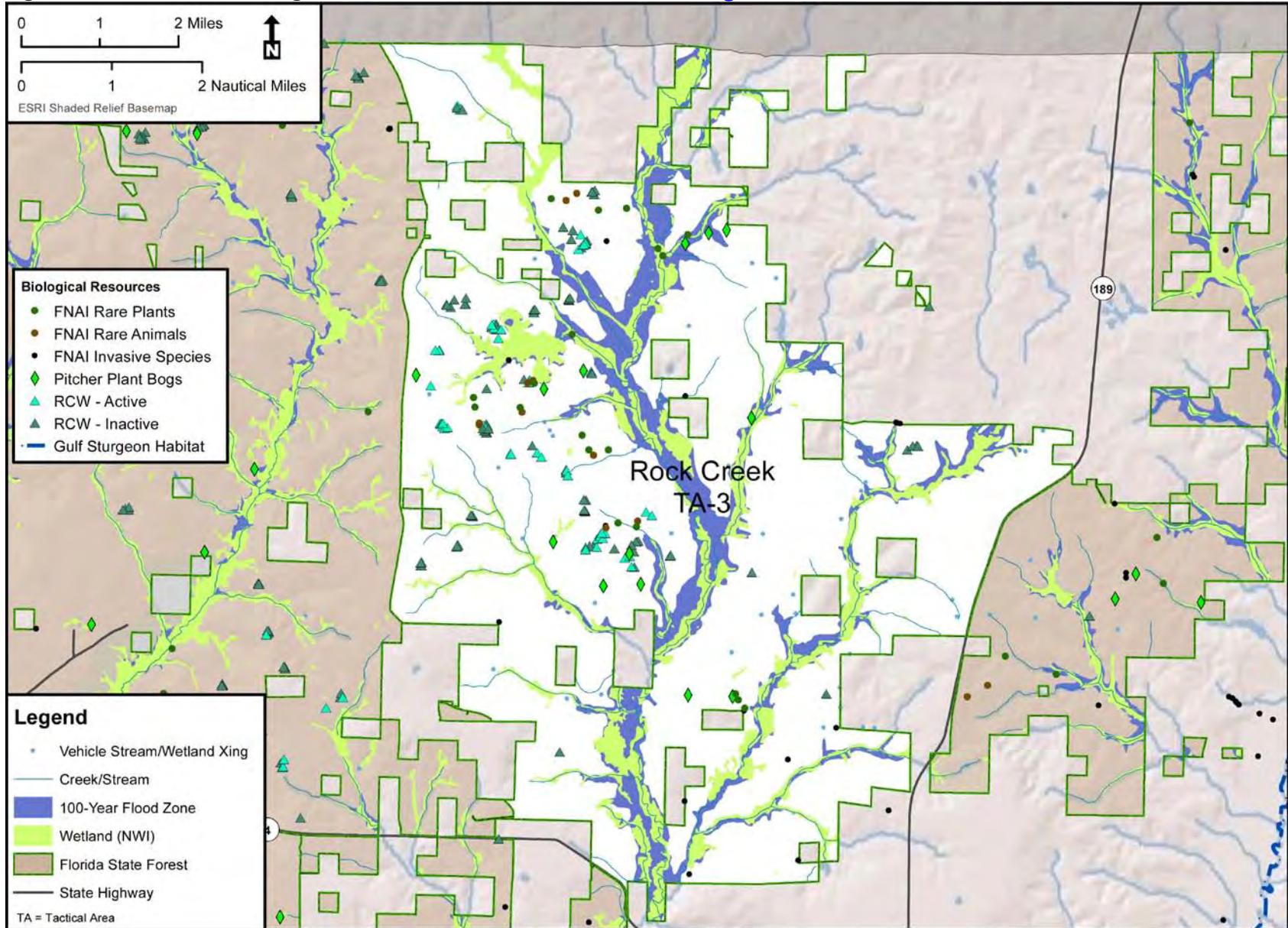


Figure 5-35. Water and Biological Resources – TA-4 at BRSF (Return to [Figure 5-35](#))

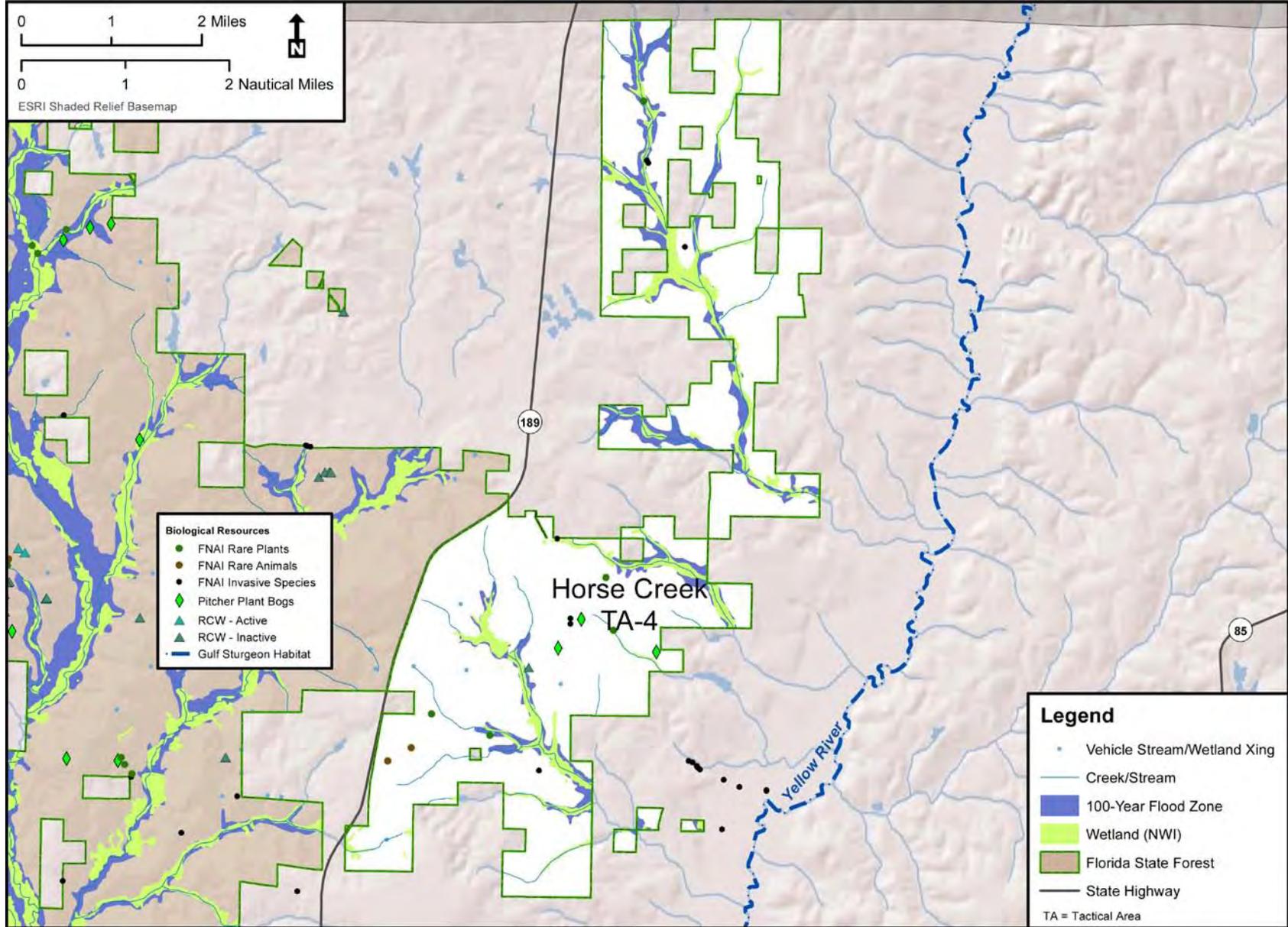


Figure 5-36. Water and Biological Resources – TA-5 at BRSF (Return to [Figure 5-36](#))

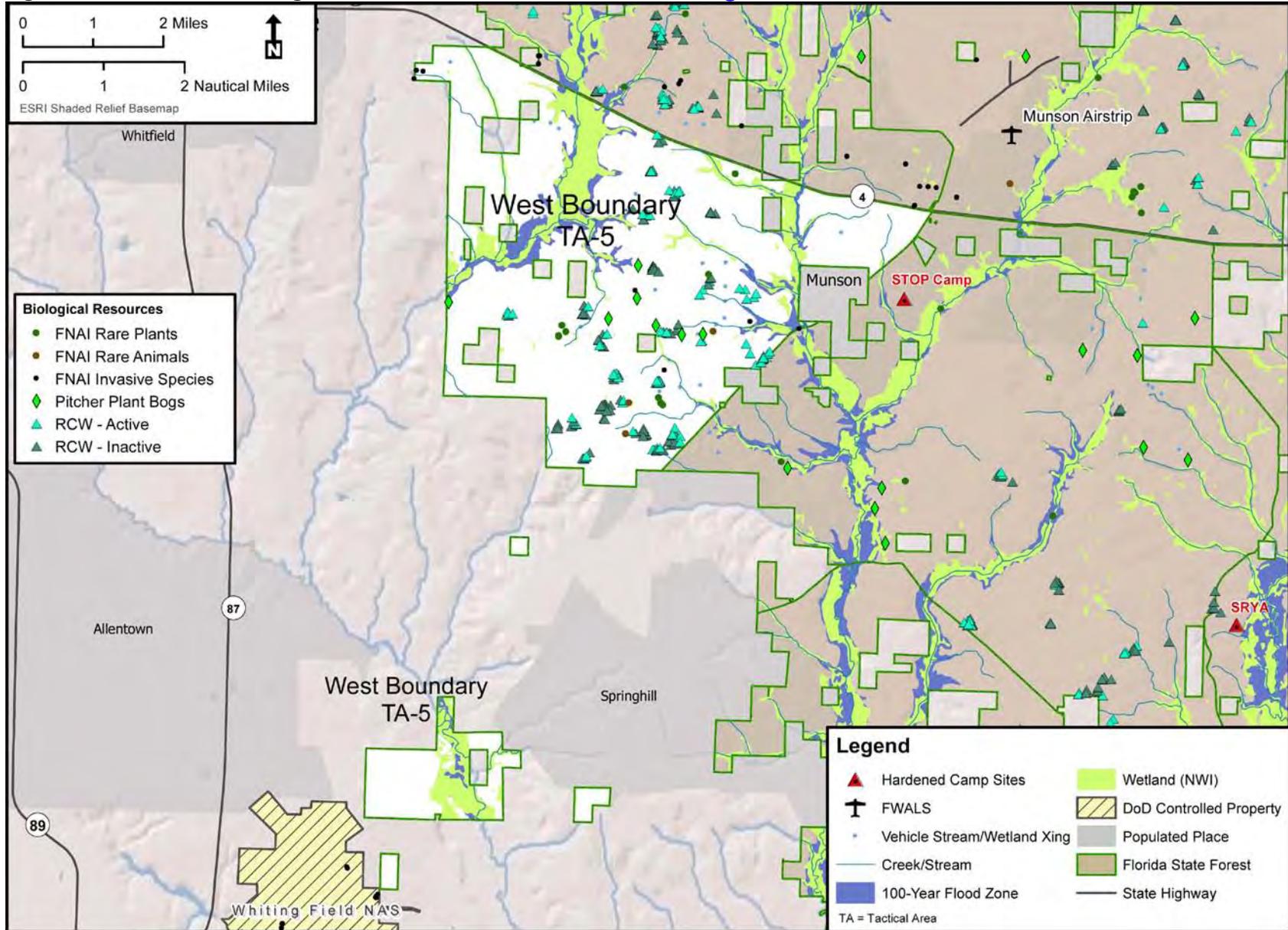


Figure 5-37. Water and Biological Resources – TA-6 at BRSF (Return to [Figure 5-37](#))

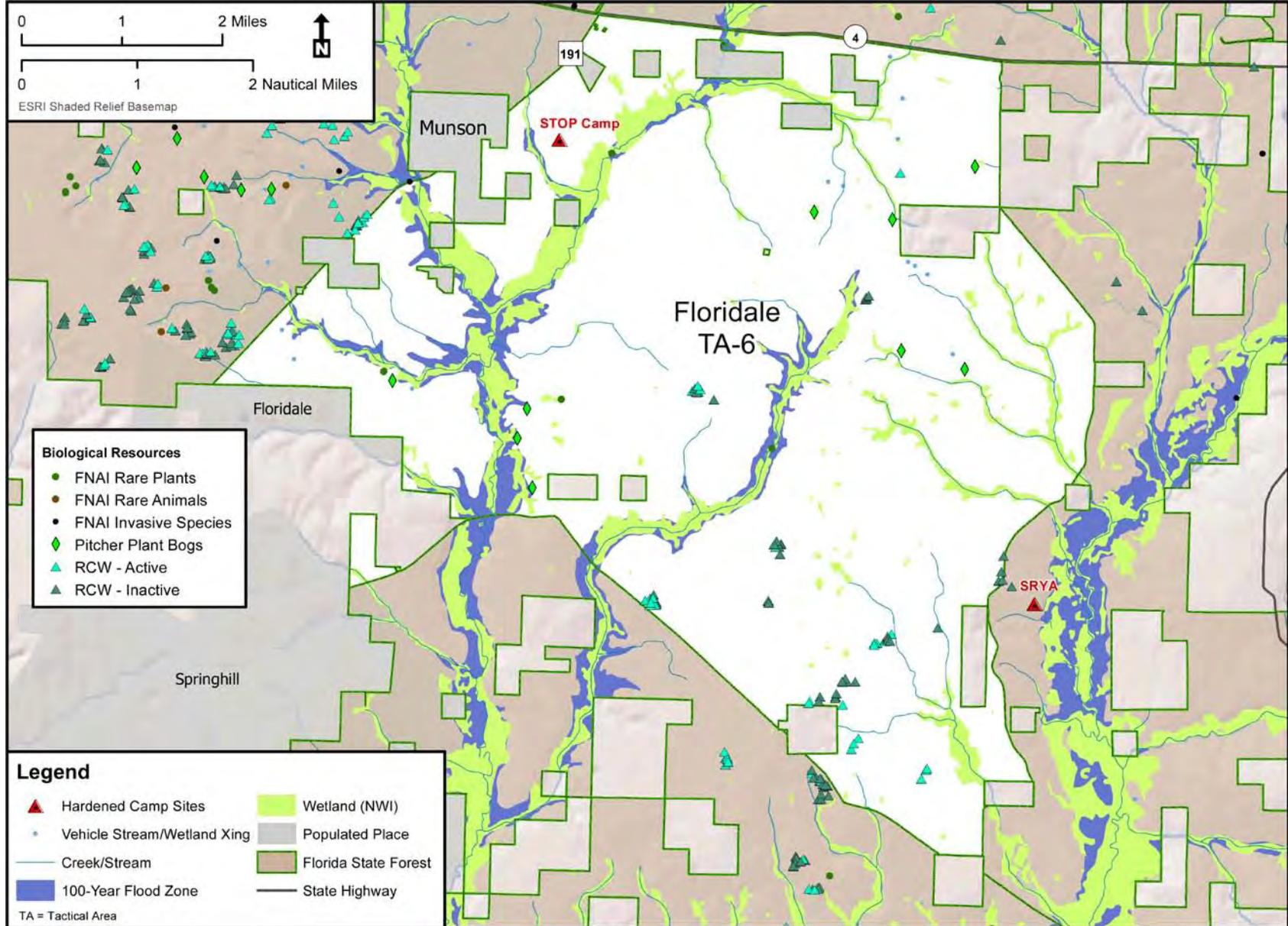


Figure 5-38. Water and Biological Resources – TA-7 at BRSF (Return to [Figure 5-38](#))

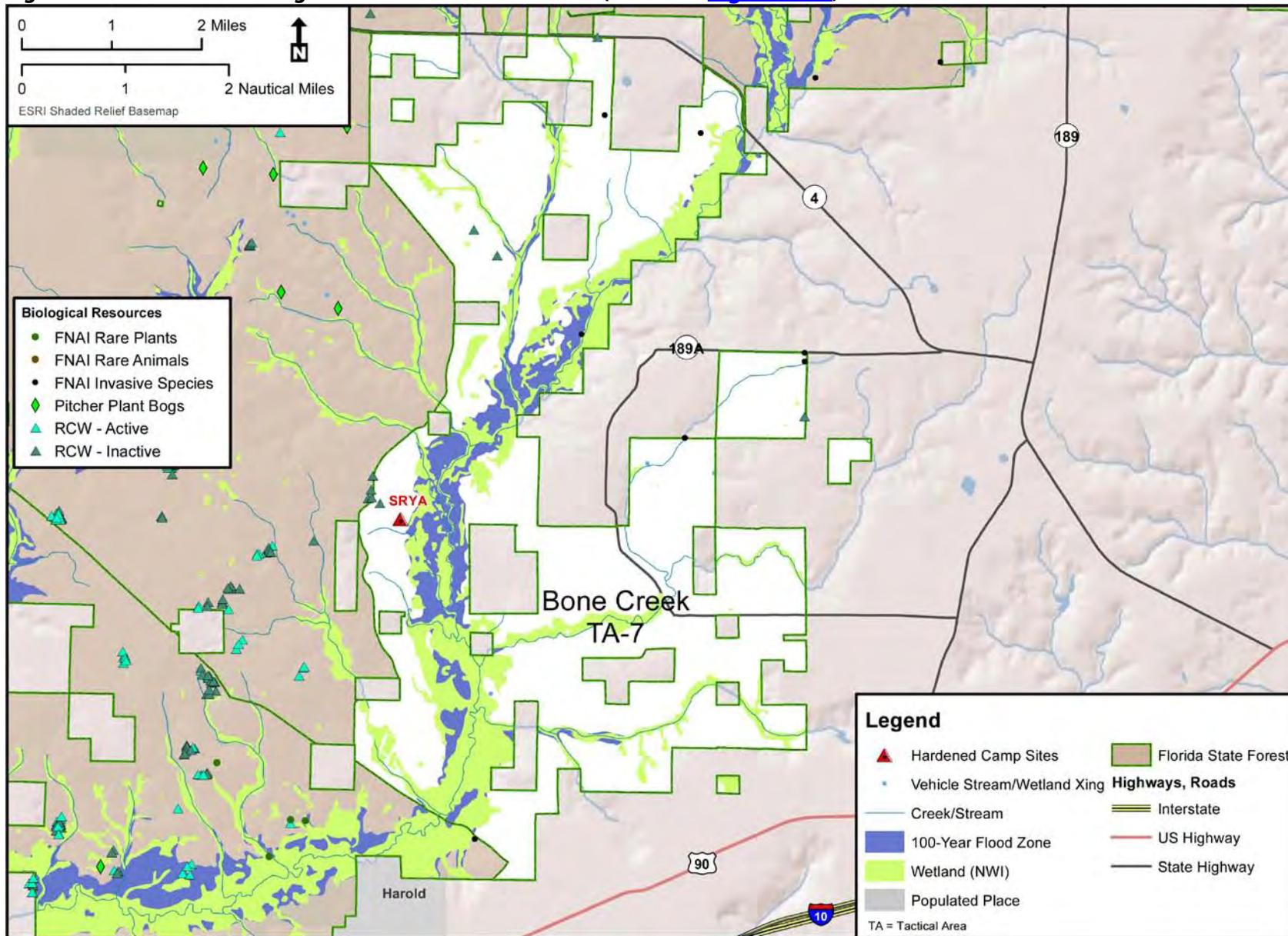


Figure 5-39. Water and Biological Resources – TA-8 at BRSF (Return to [Figure 5-39](#))

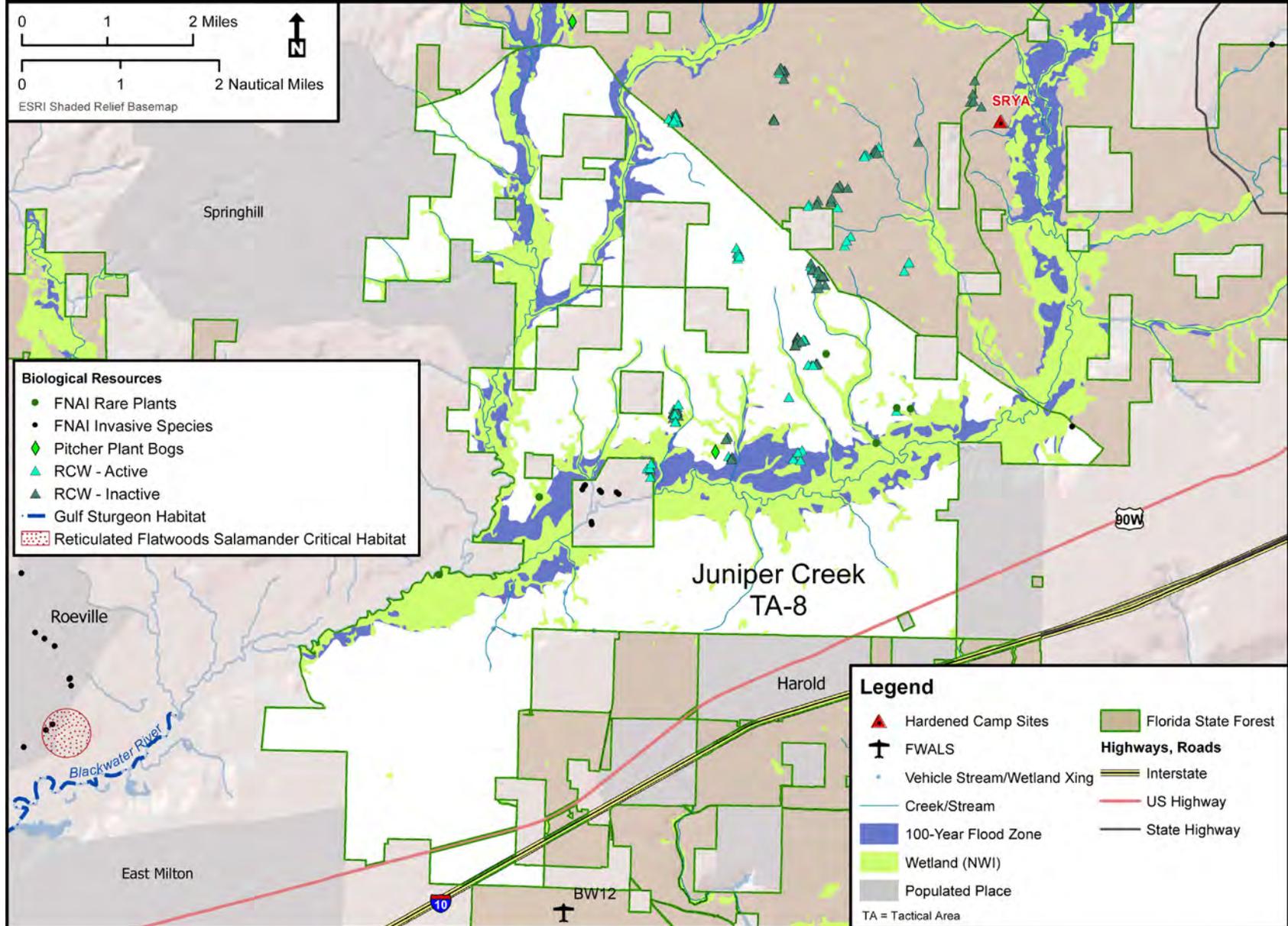


Figure 5-40. Water and Biological Resources – TA-9 at BRSF (Return to [Figure 5-40](#))

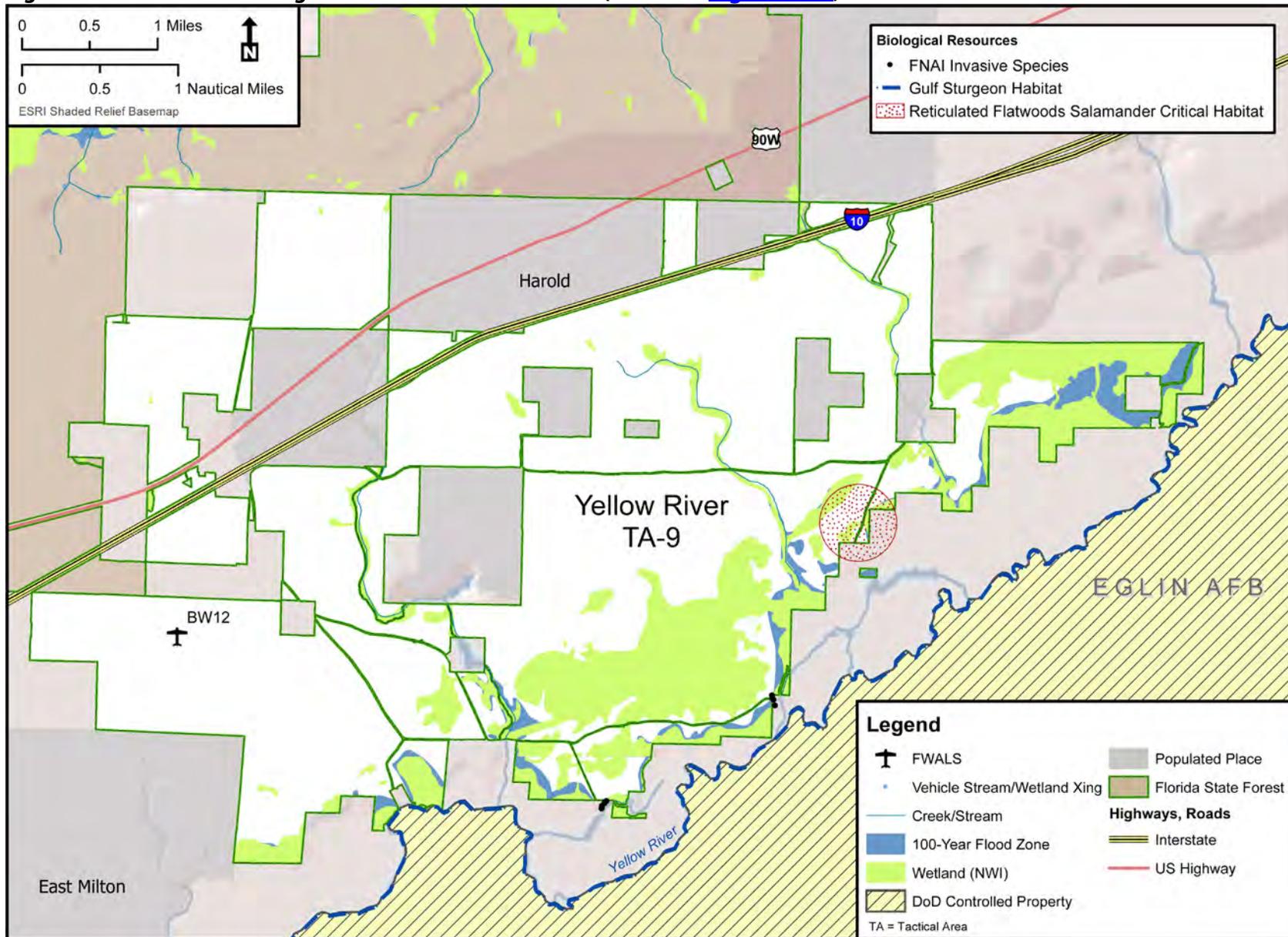


Figure 5-41. Cultural Resource Survey in BRSF (Return to [Figure 5-41](#))

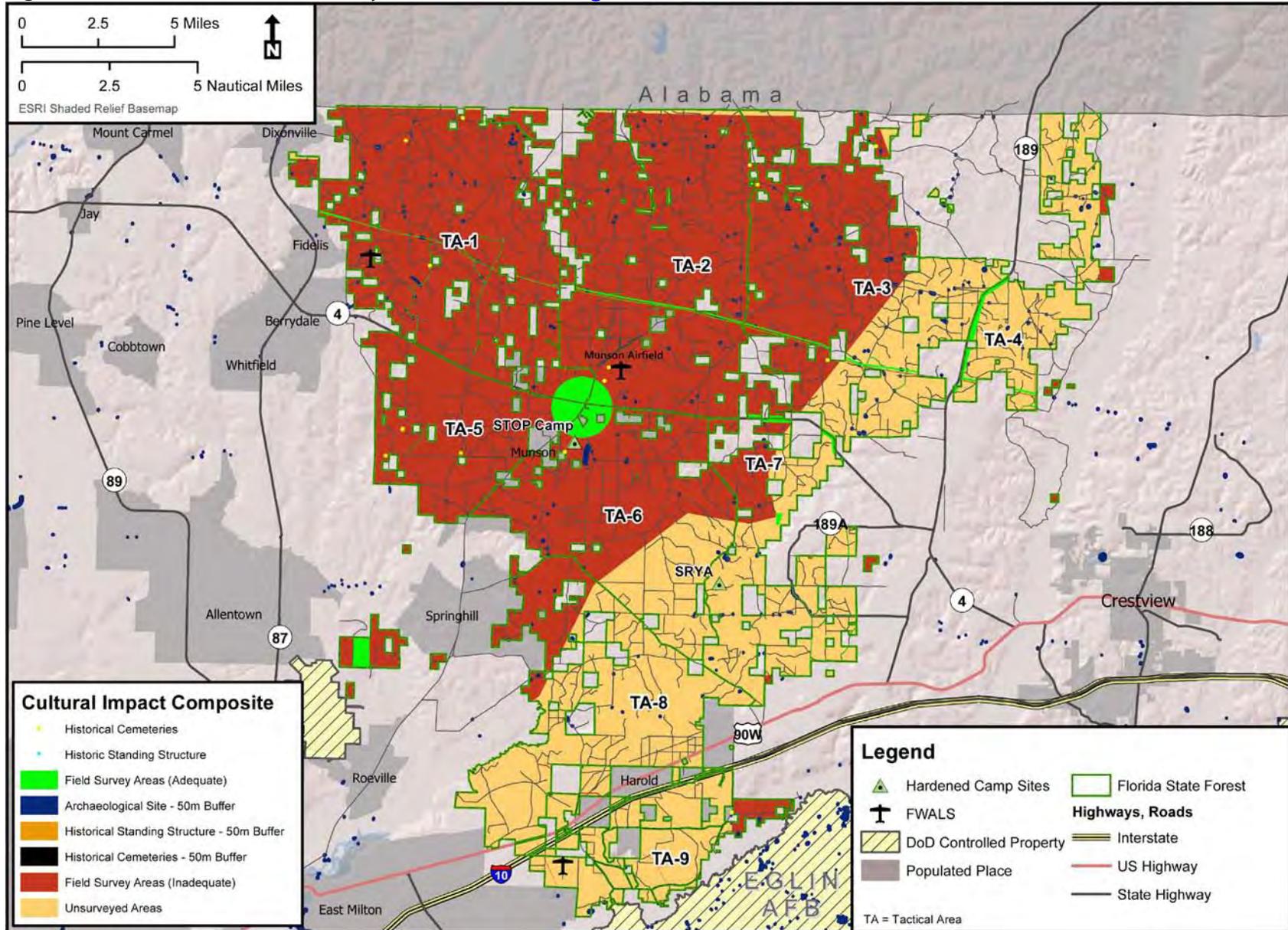


Figure 5-42. Land Use Types at BRSF (Return to [Figure 5-42](#))

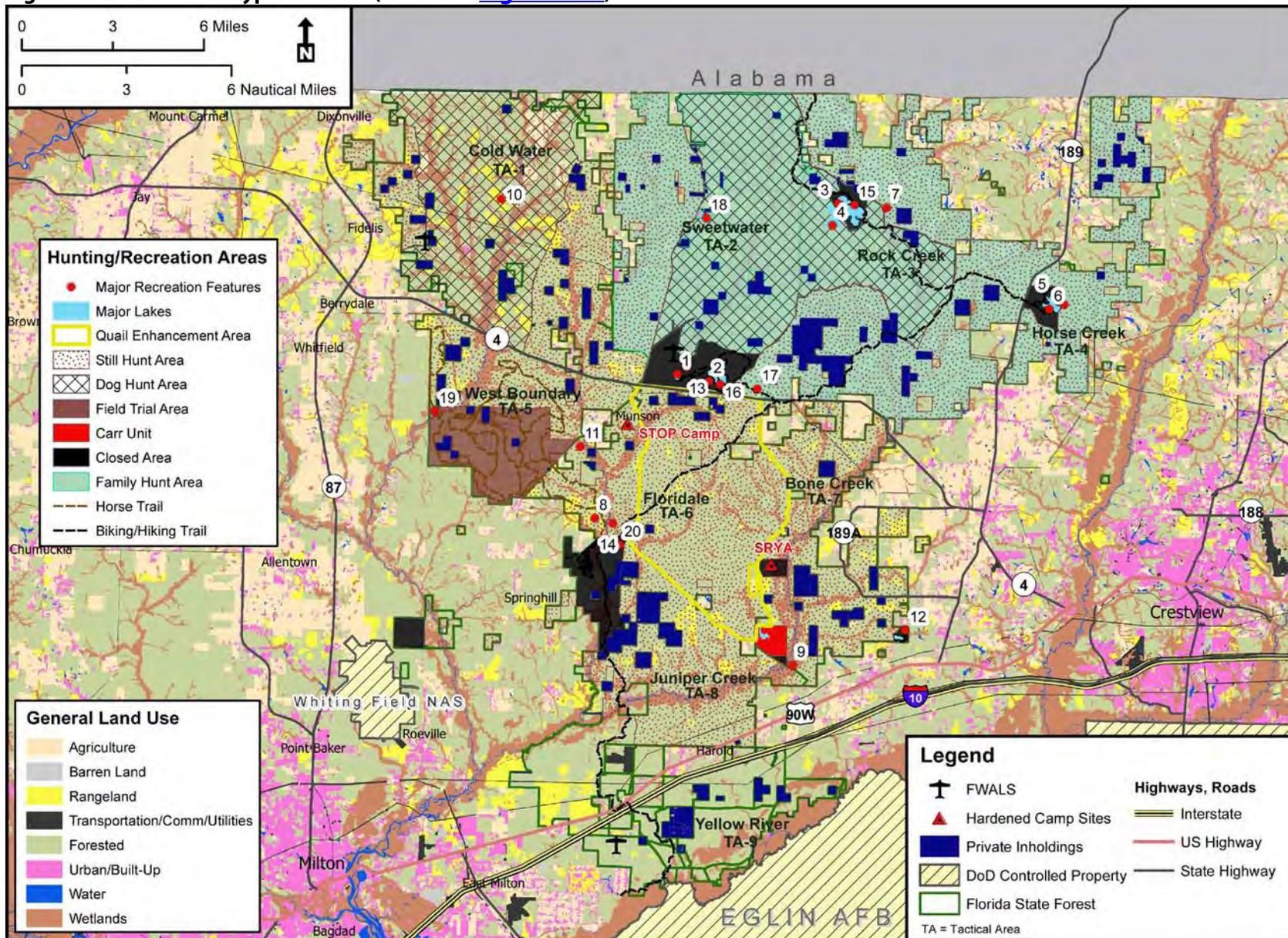


Figure 5-43. Environmental Justice Areas of Concern Near BRSF (Return to [Figure 5-43](#))

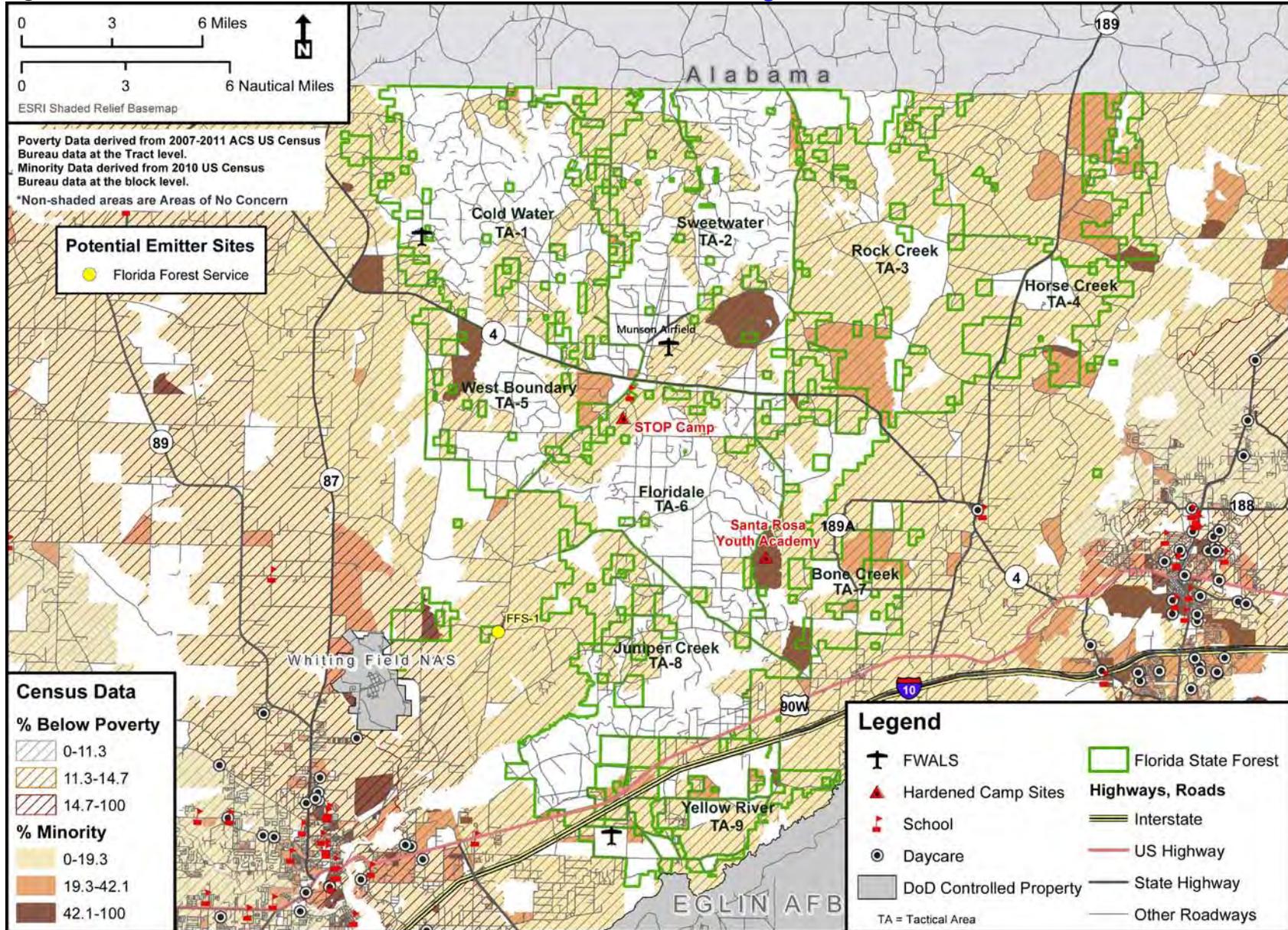


Figure 6-1. THSF Ground Operations Protection Levels (Return to [Figure 6-1](#))

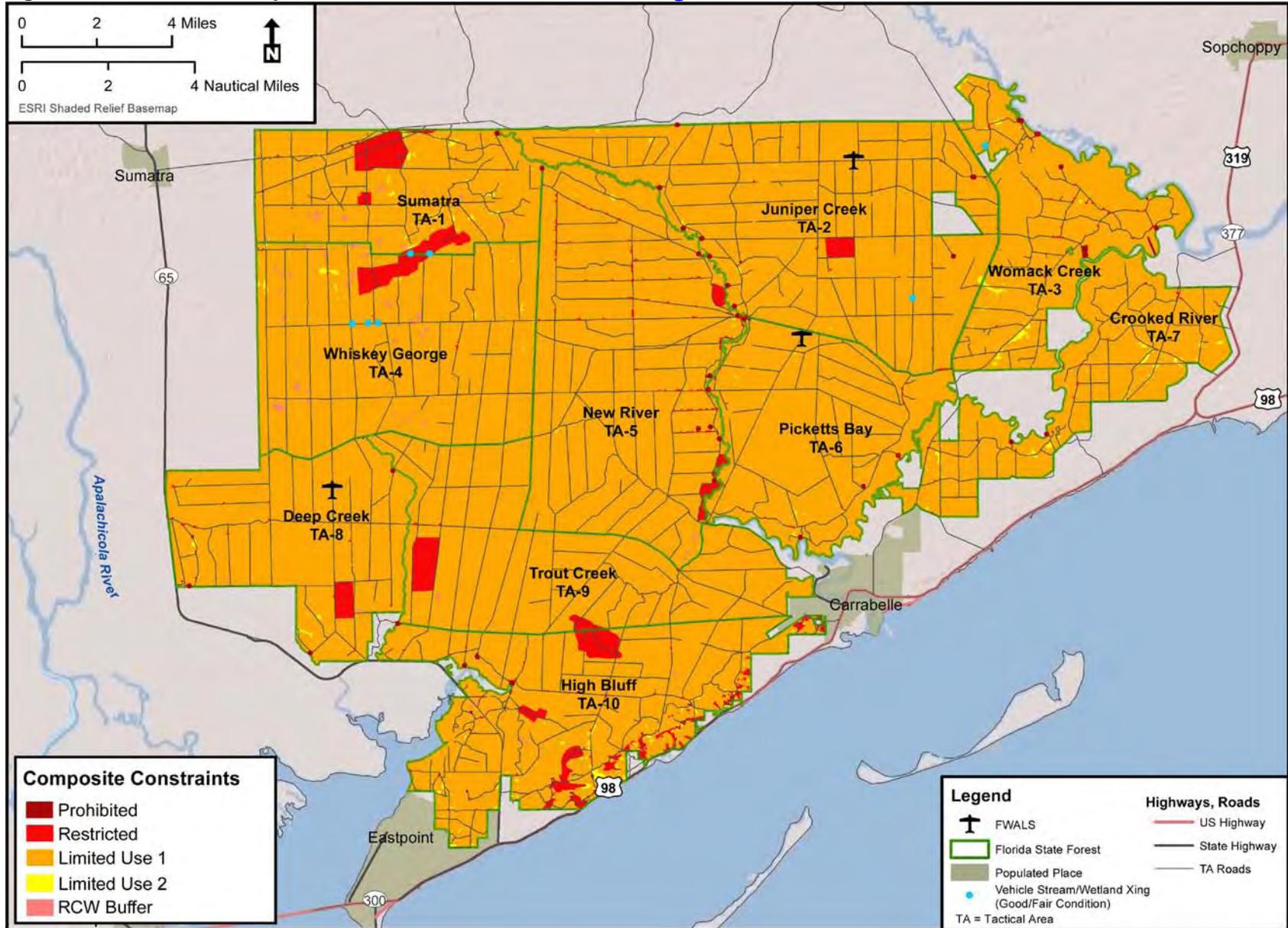


Figure 6-2. THSF TA-1 Ground Operations Protection Levels (Return to [Figure 6-2](#))

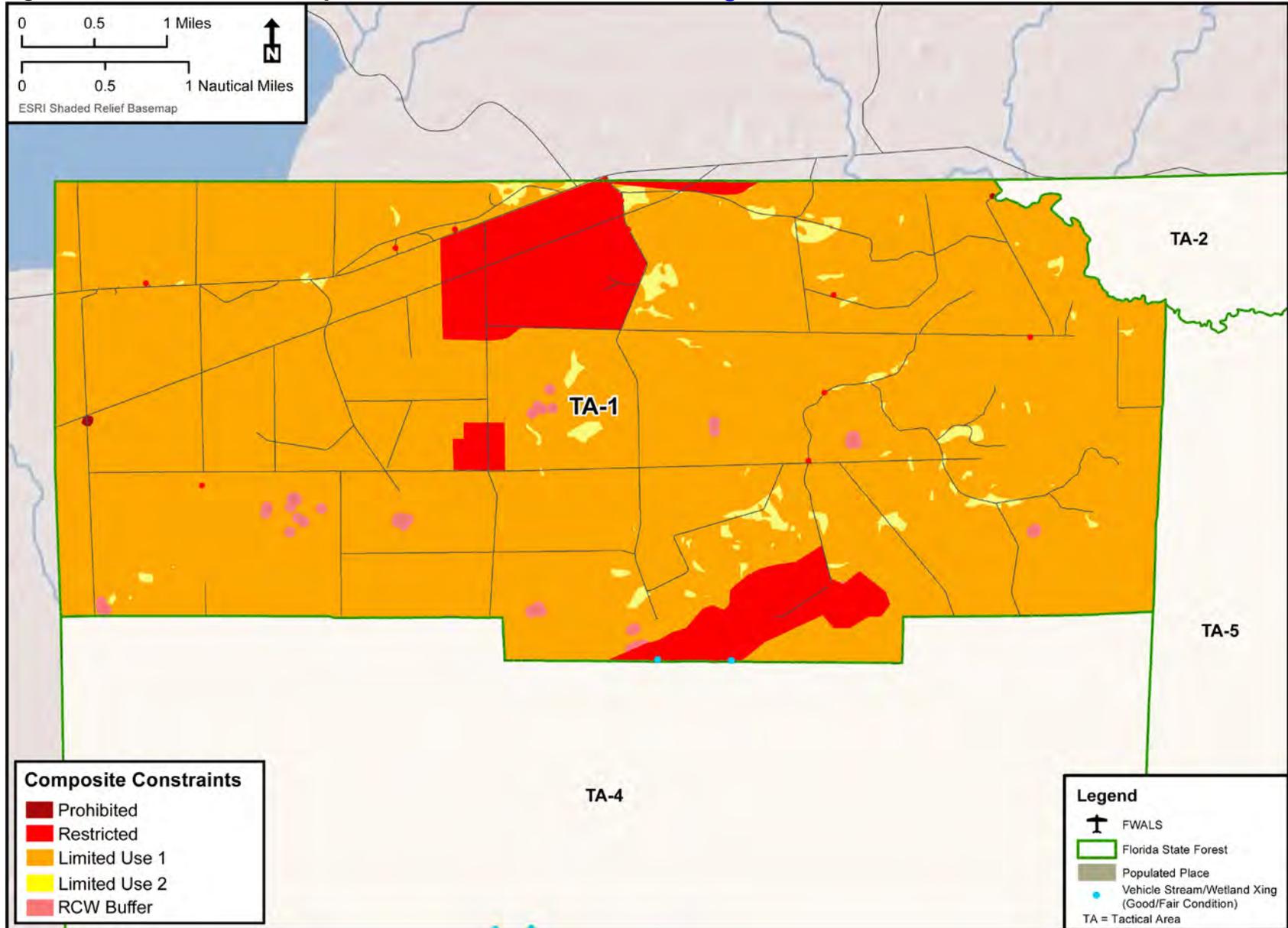


Figure 6-3. THSF TA-2 Ground Operations Protection Levels (Return to [Figure 6-3](#))

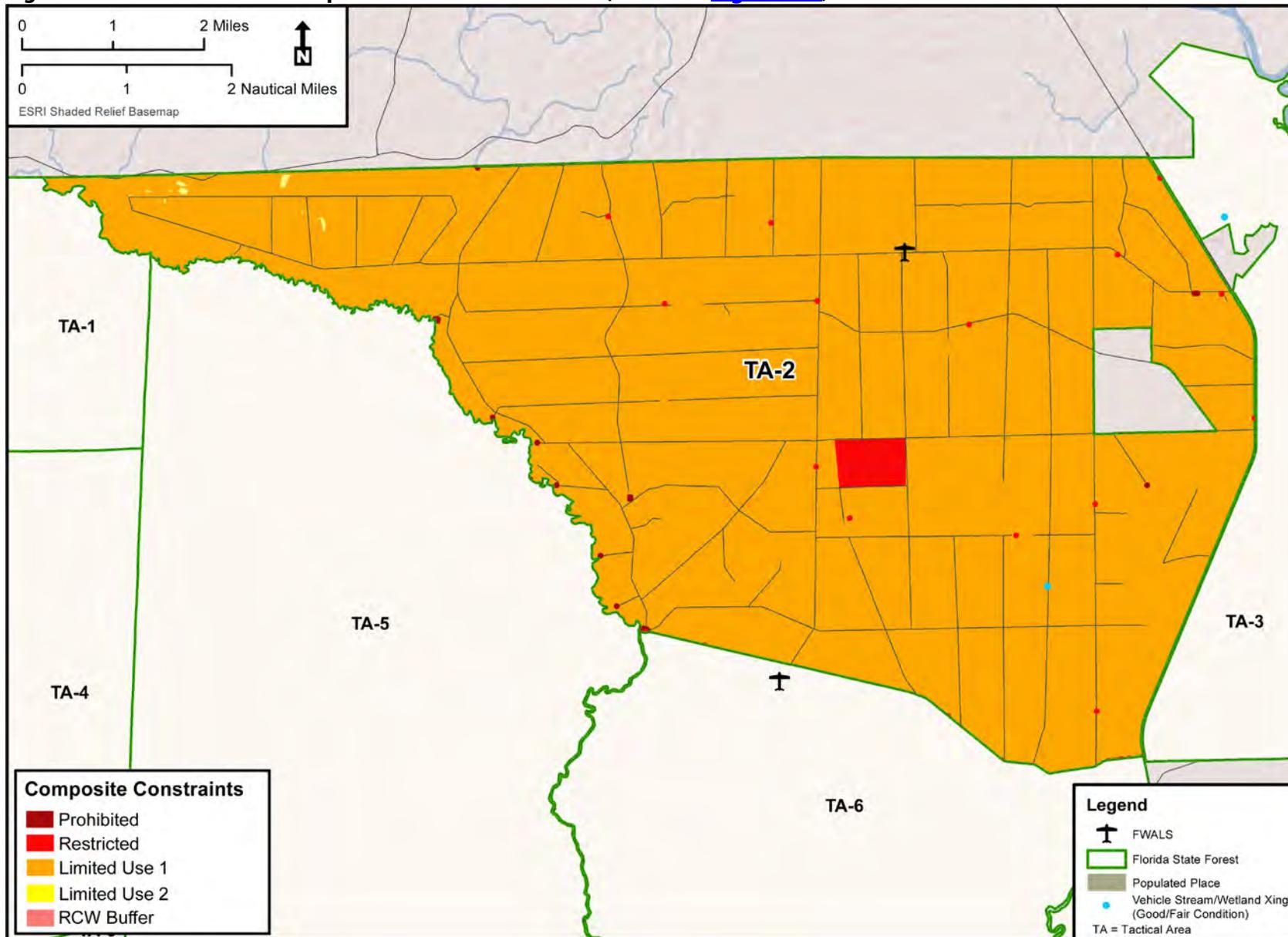


Figure 6-4. THSF TA-3 Ground Operations Protection Levels (Return to [Figure 6-4](#))

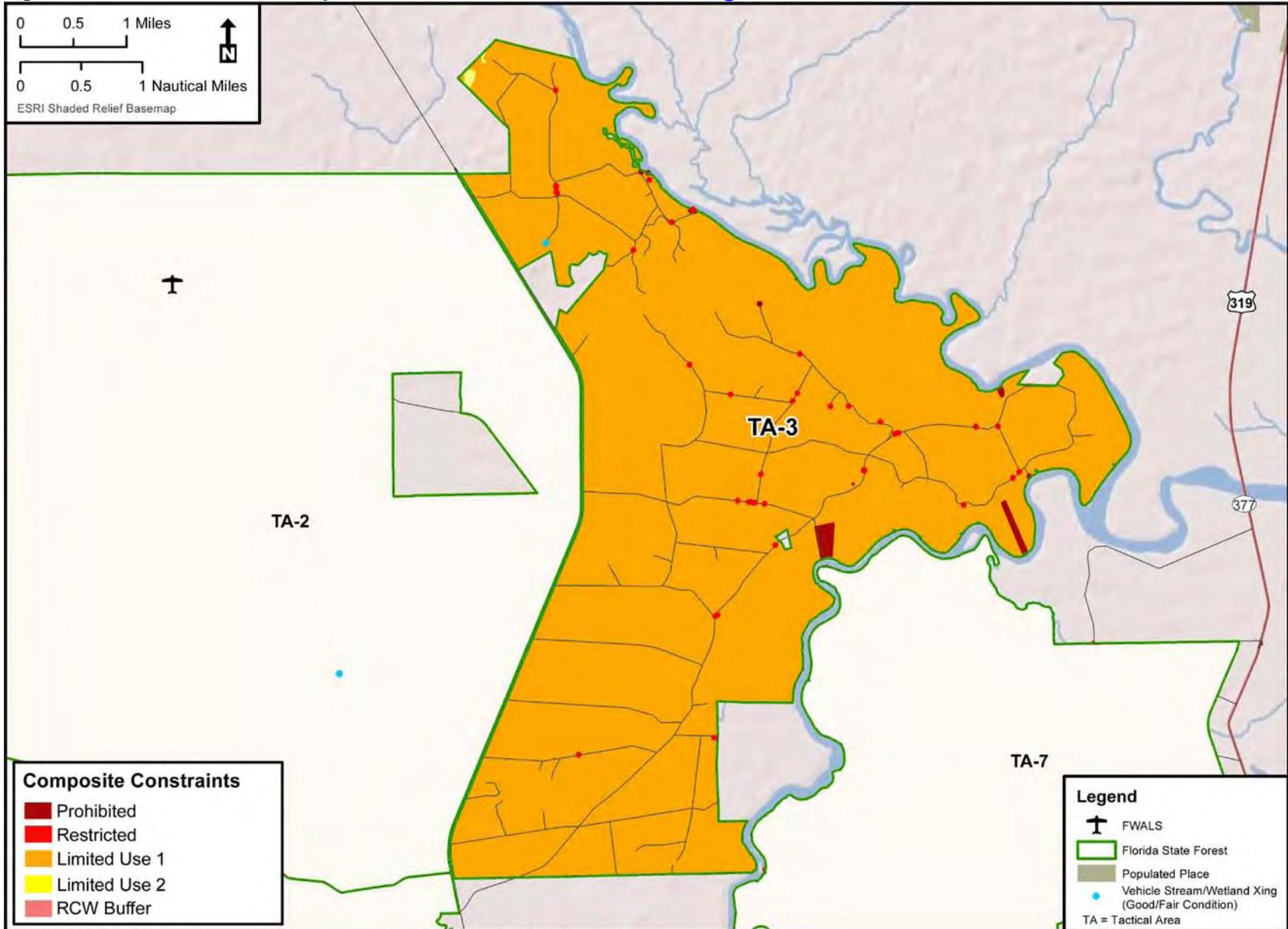


Figure 6-5. THSF TA-4 Ground Operations Protection Levels (Return to [Figure 6-5](#))

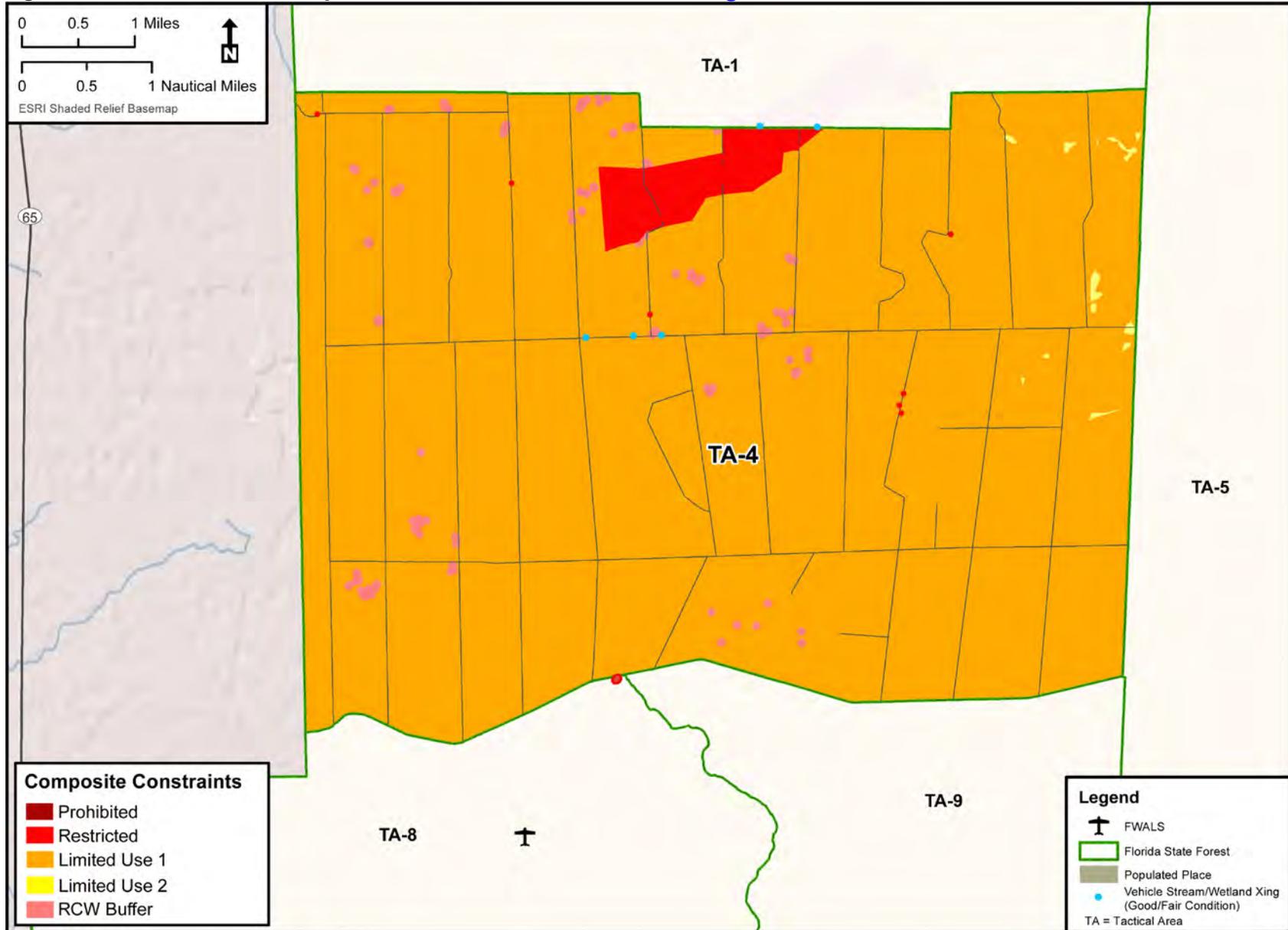


Figure 6-6. THSF TA-5 Ground Operations Protection Levels (Return to [Figure 6-6](#))

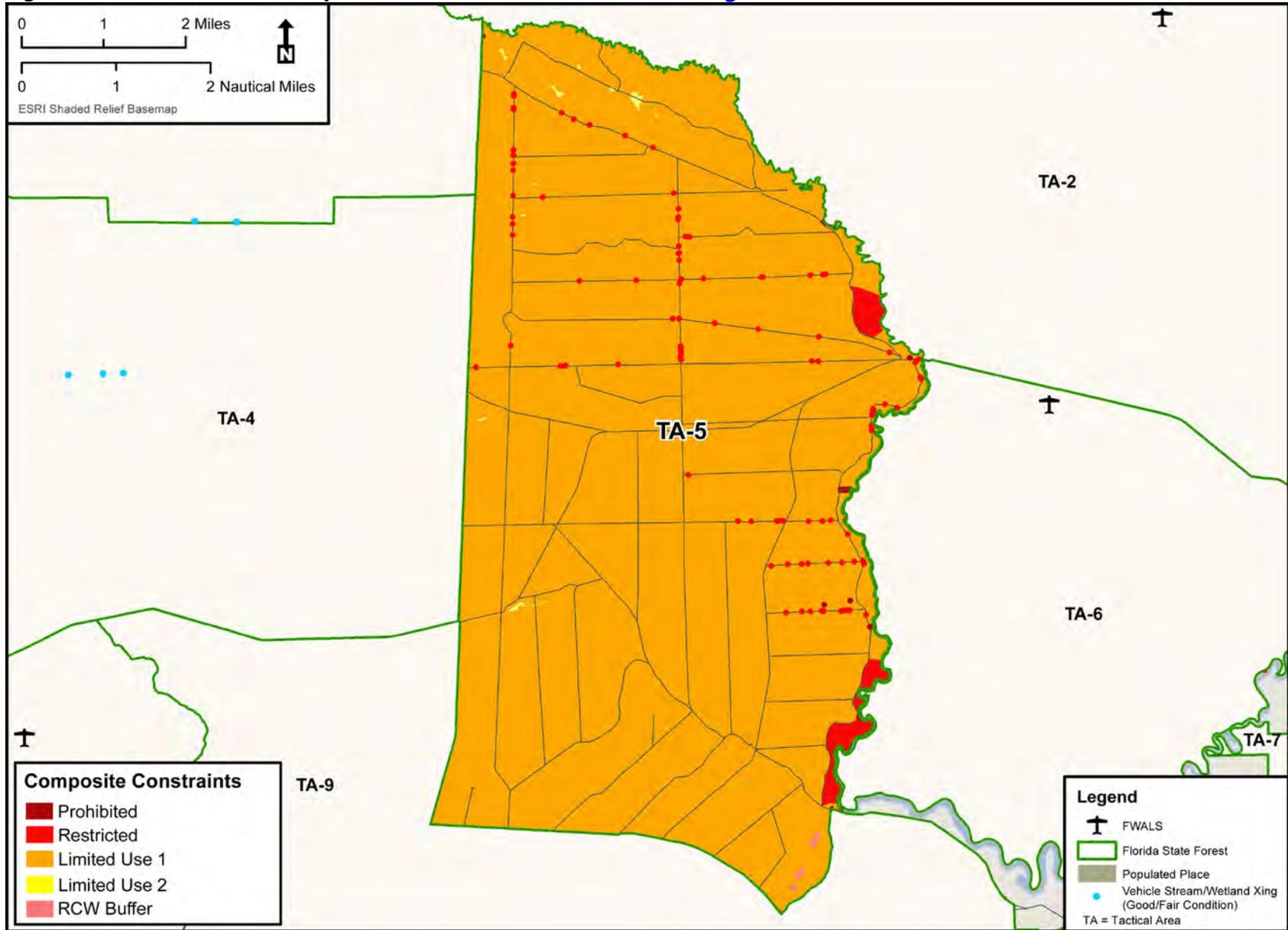


Figure 6-7. THSF TA-6 Ground Operations Protection Levels (Return to [Figure 6-7](#))

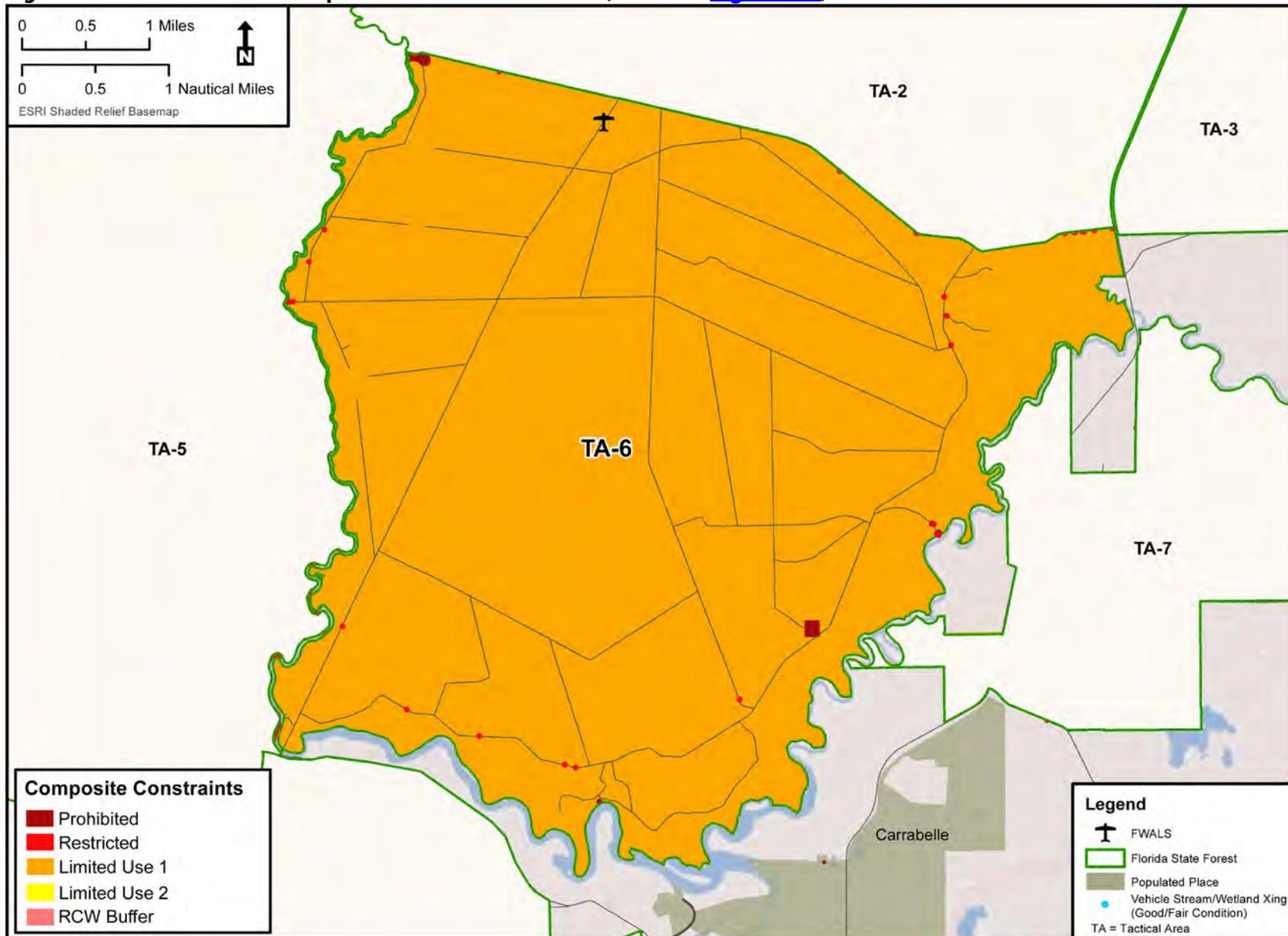


Figure 6-8. THSF TA-7 Ground Operations Protection Levels (Return to [Figure 6-8](#))

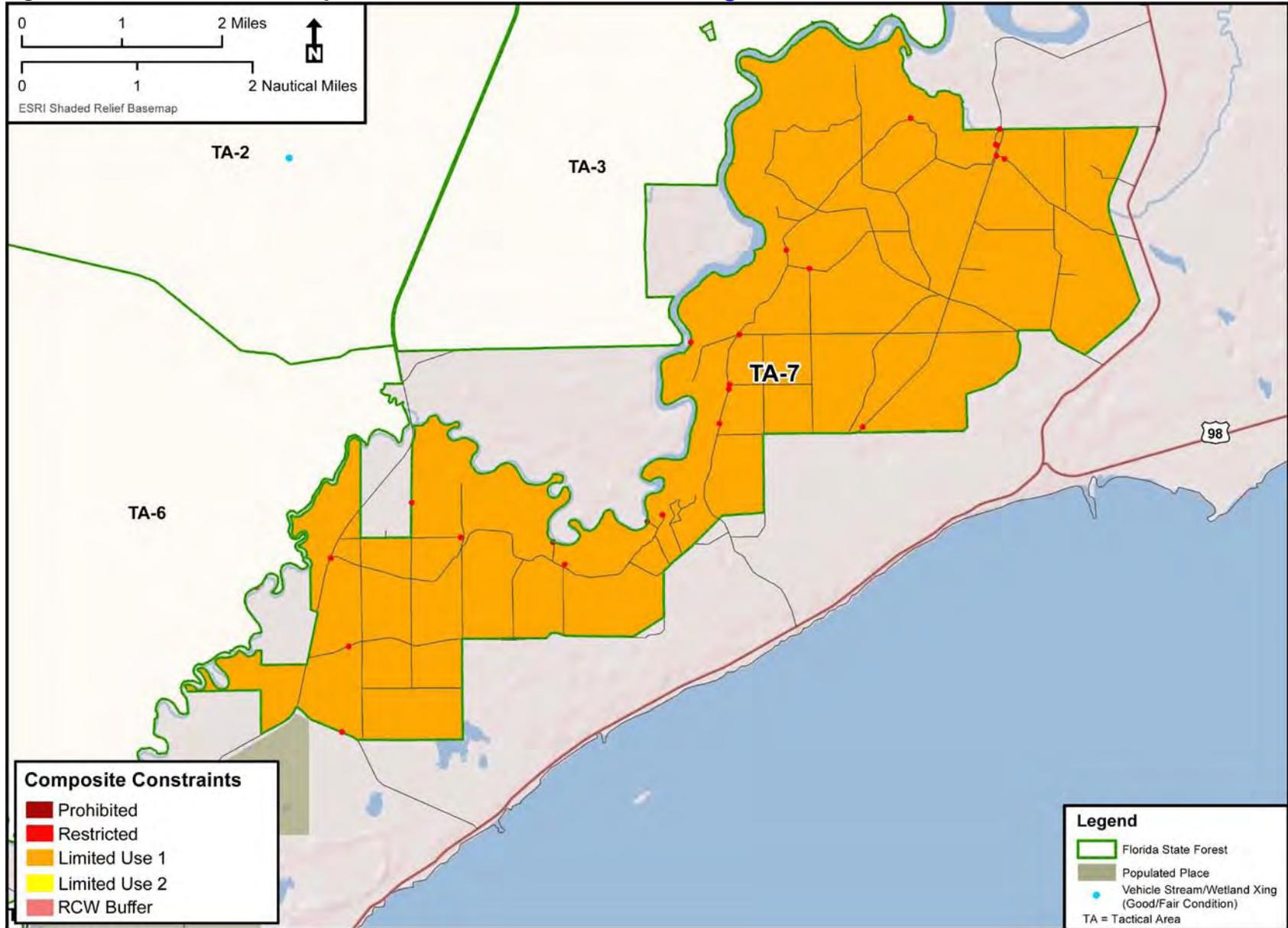


Figure 6-9. THSF TA-8 Ground Operations Protection Levels (Return to [Figure 6-9](#))

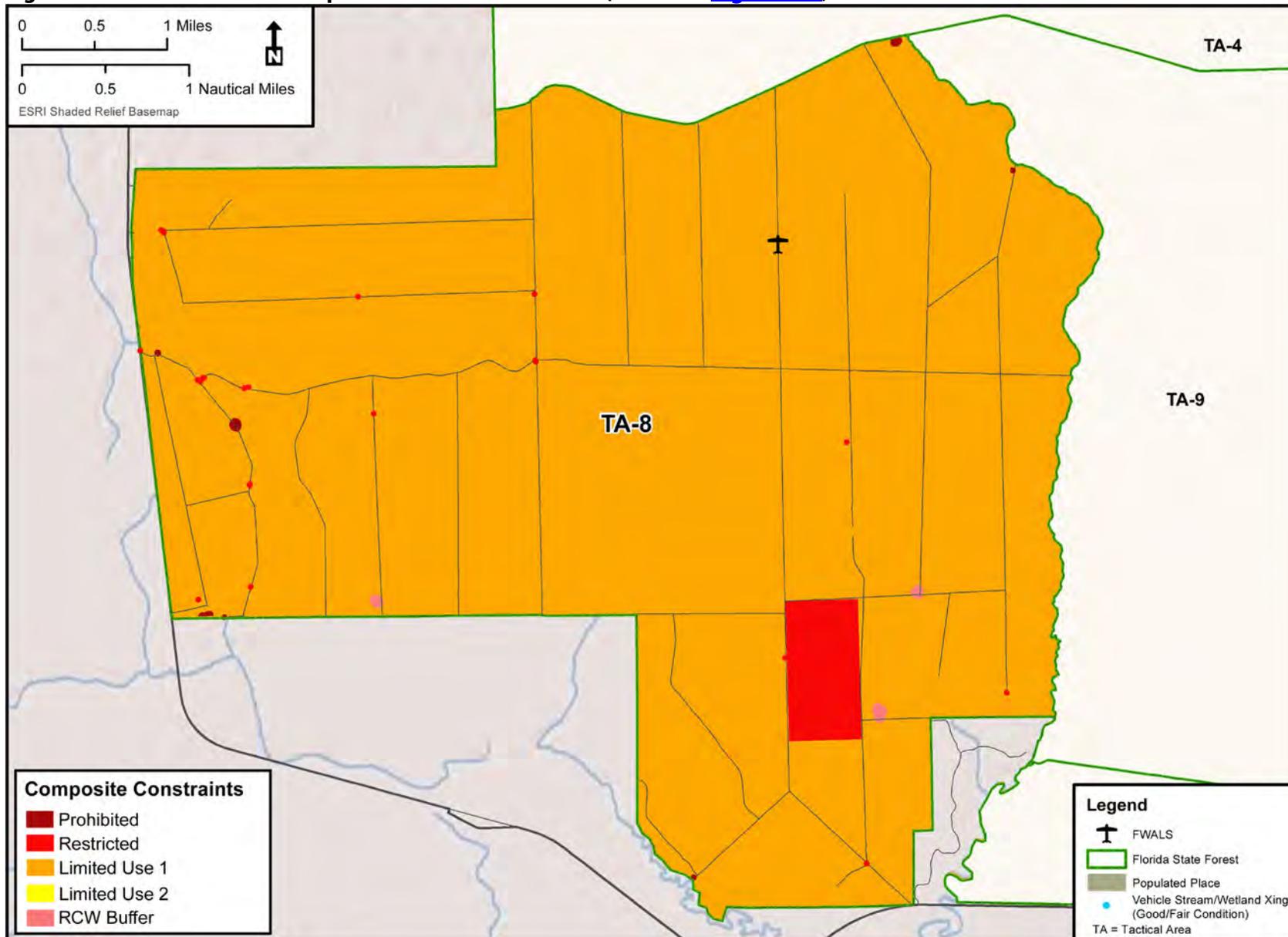


Figure 6-10. THSF TA-9 Ground Operations Protection Levels (Return to [Figure 6-10](#))

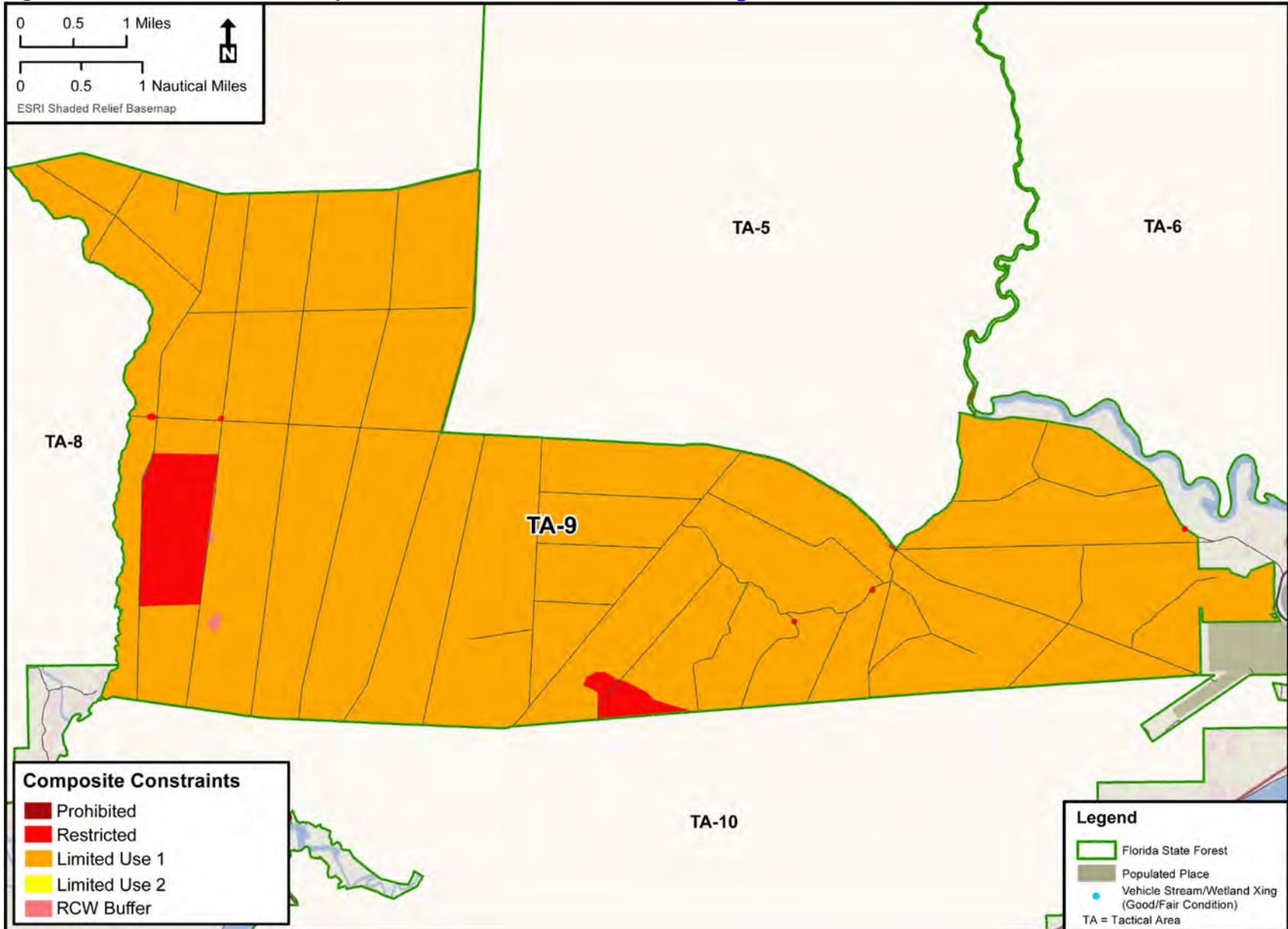


Figure 6-11. THSF TA-10 Ground Operations Protection Levels (Return to [Figure 6-11](#))

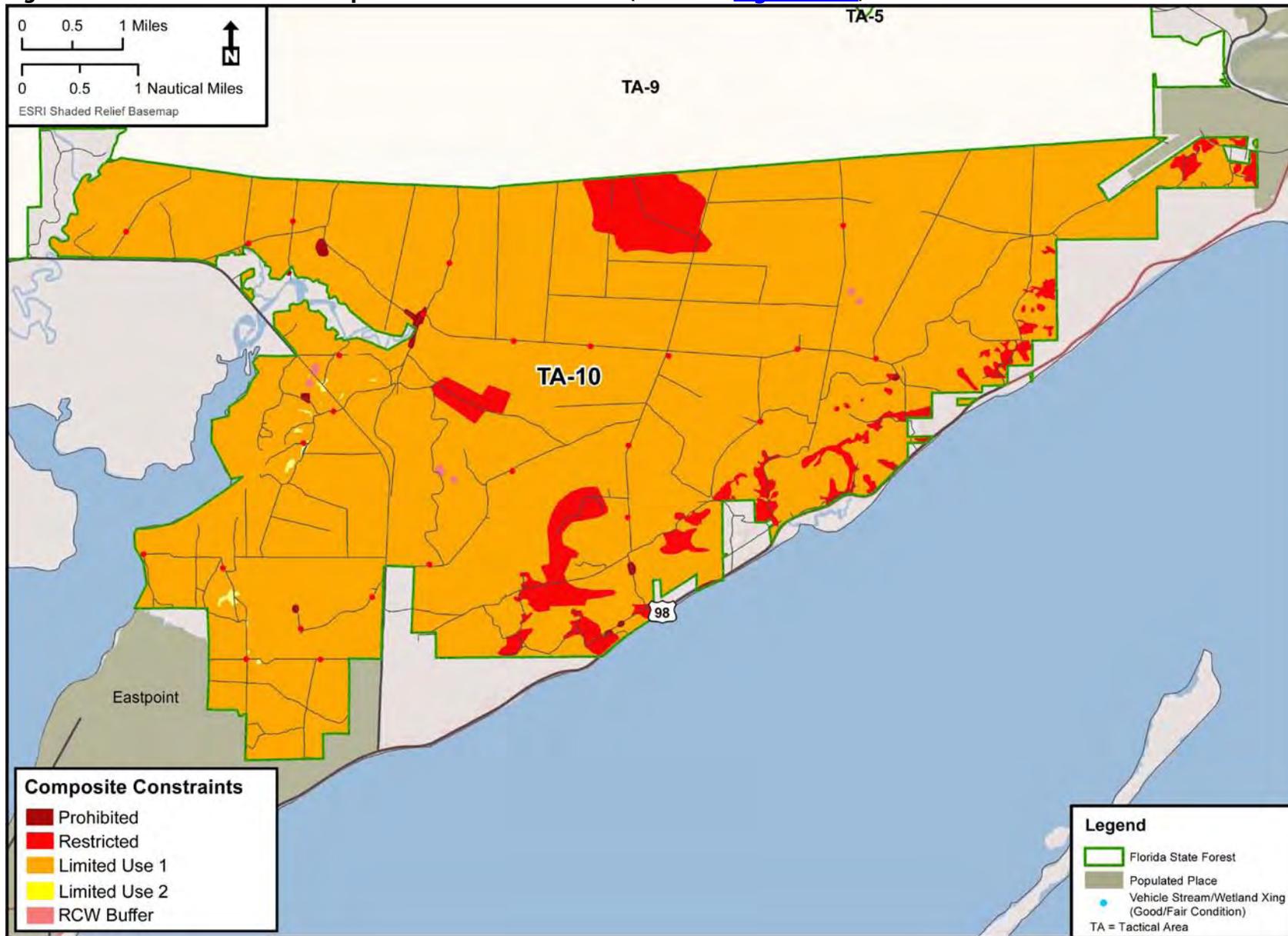


Figure 6-12. THSF Noise Protection Levels Overview (Return to [Figure 6-12](#))

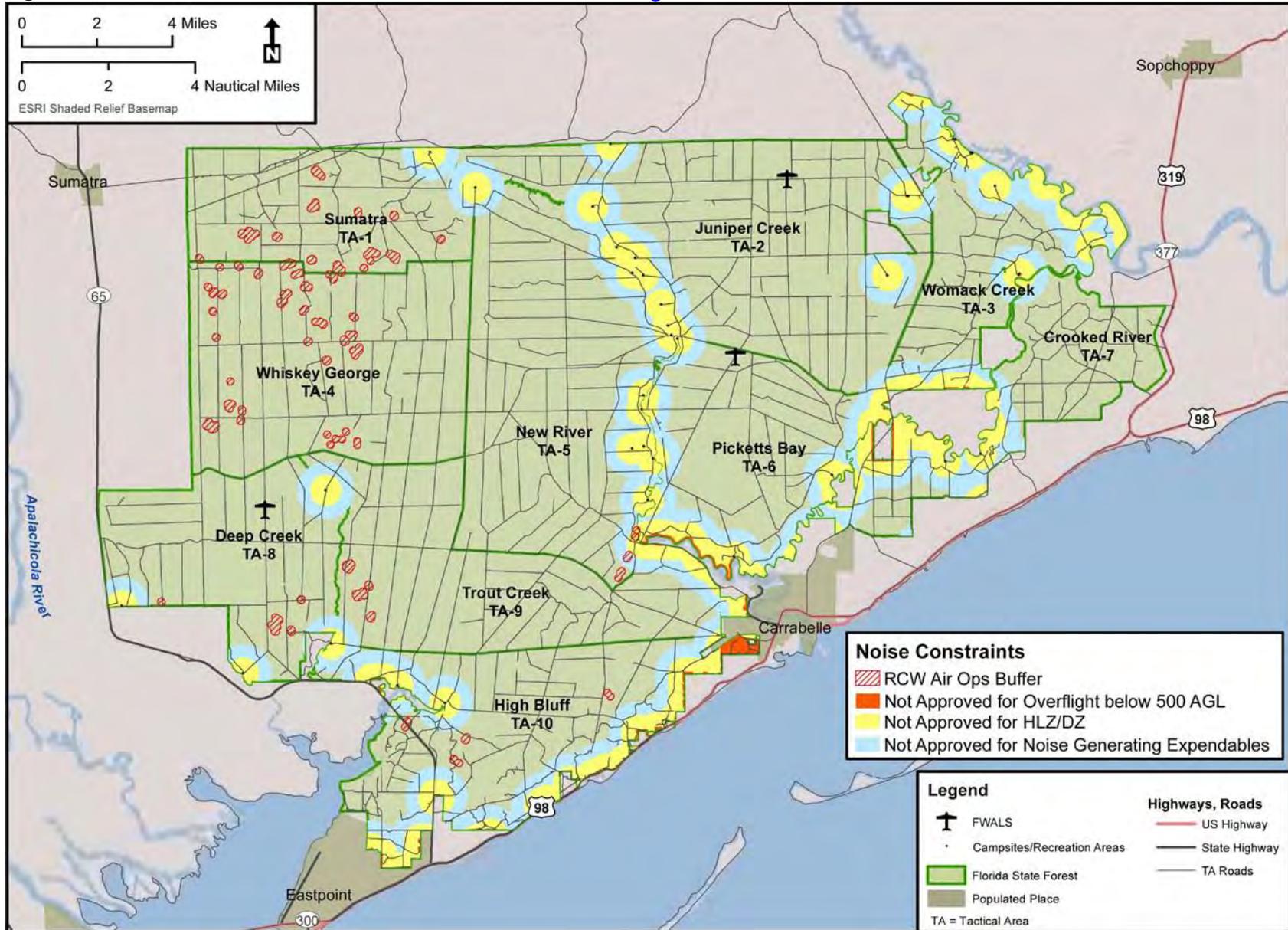


Figure 6-13. THSF TA-1 Noise Protection Levels (Return to [Figure 6-13](#))

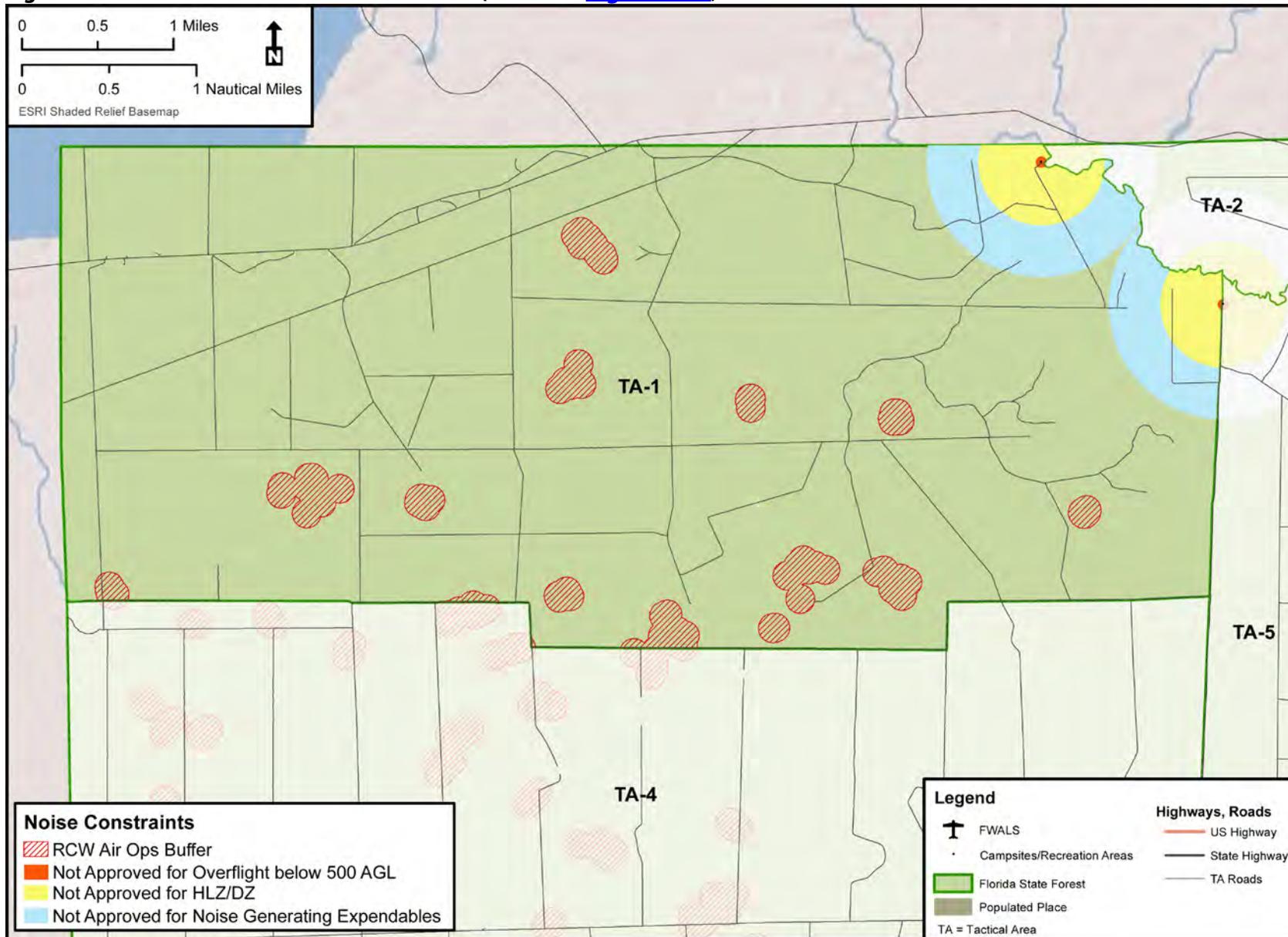


Figure 6-14. THSF TA-2 Noise Protection Levels (Return to [Figure 6-14](#))

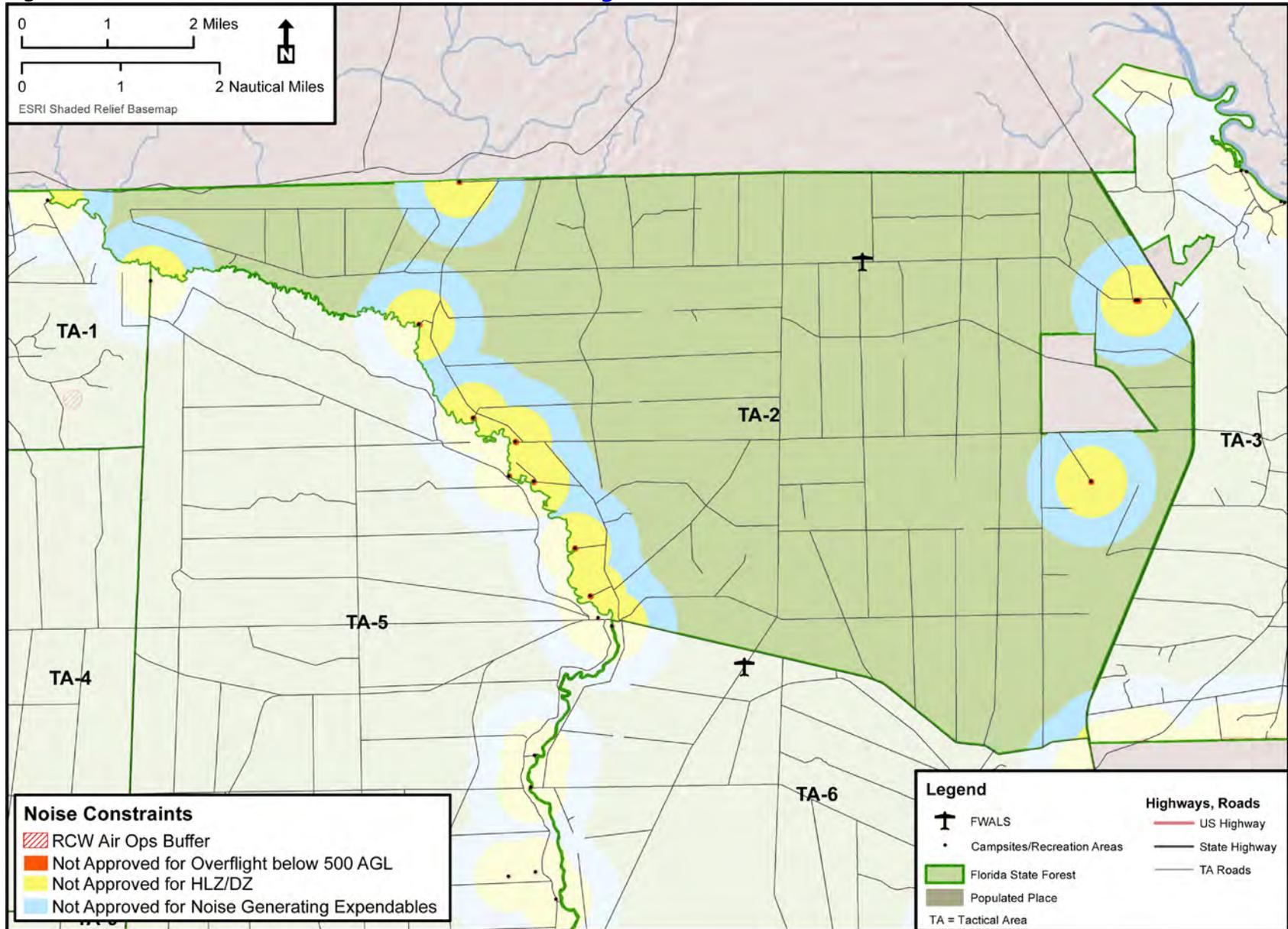


Figure 6-15. THSF TA-3 Noise Protection Levels (Return to [Figure 6-15](#))

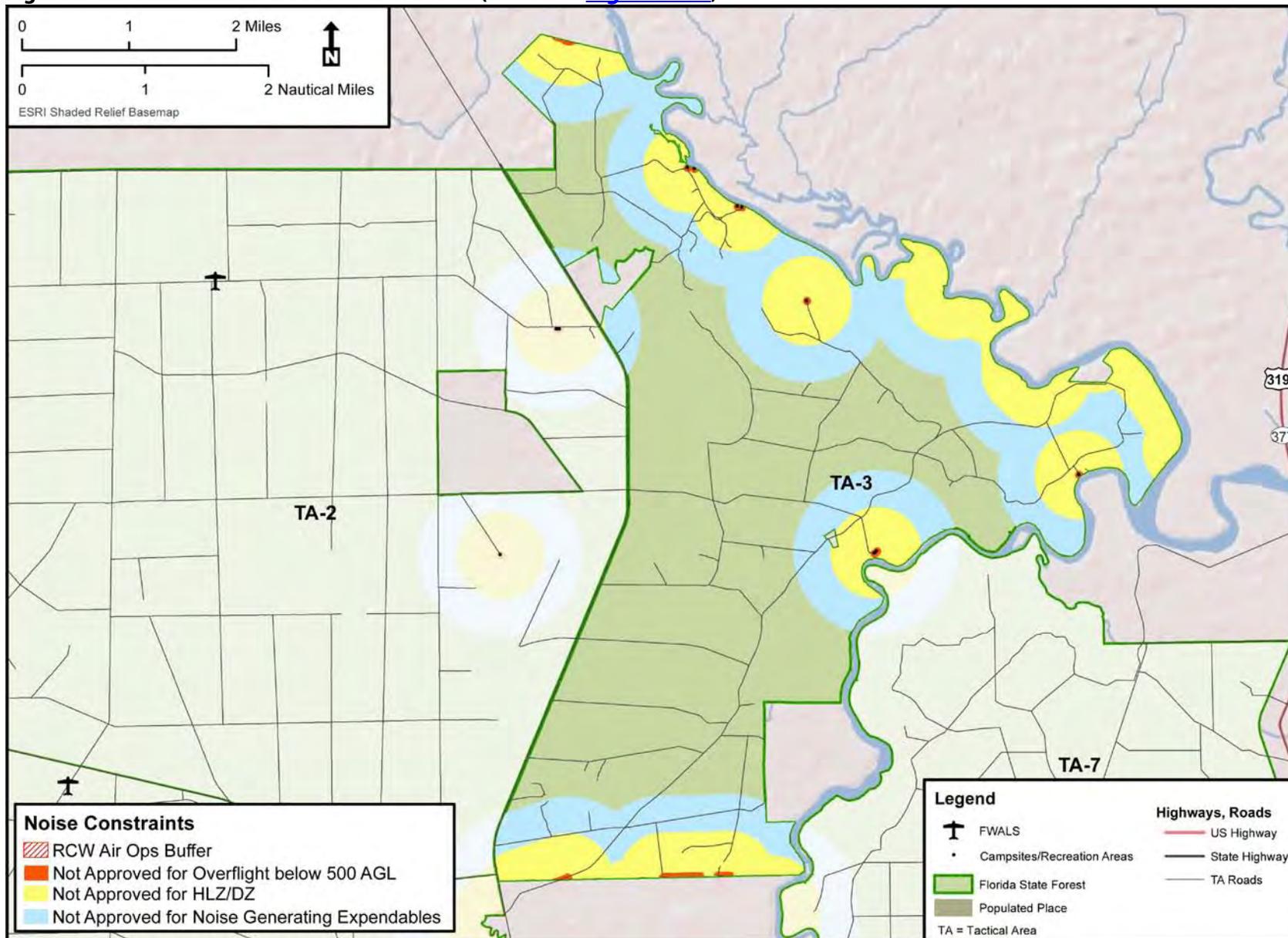


Figure 6-16. THSF TA-4 Noise Protection Levels (Return to [Figure 6-16](#))

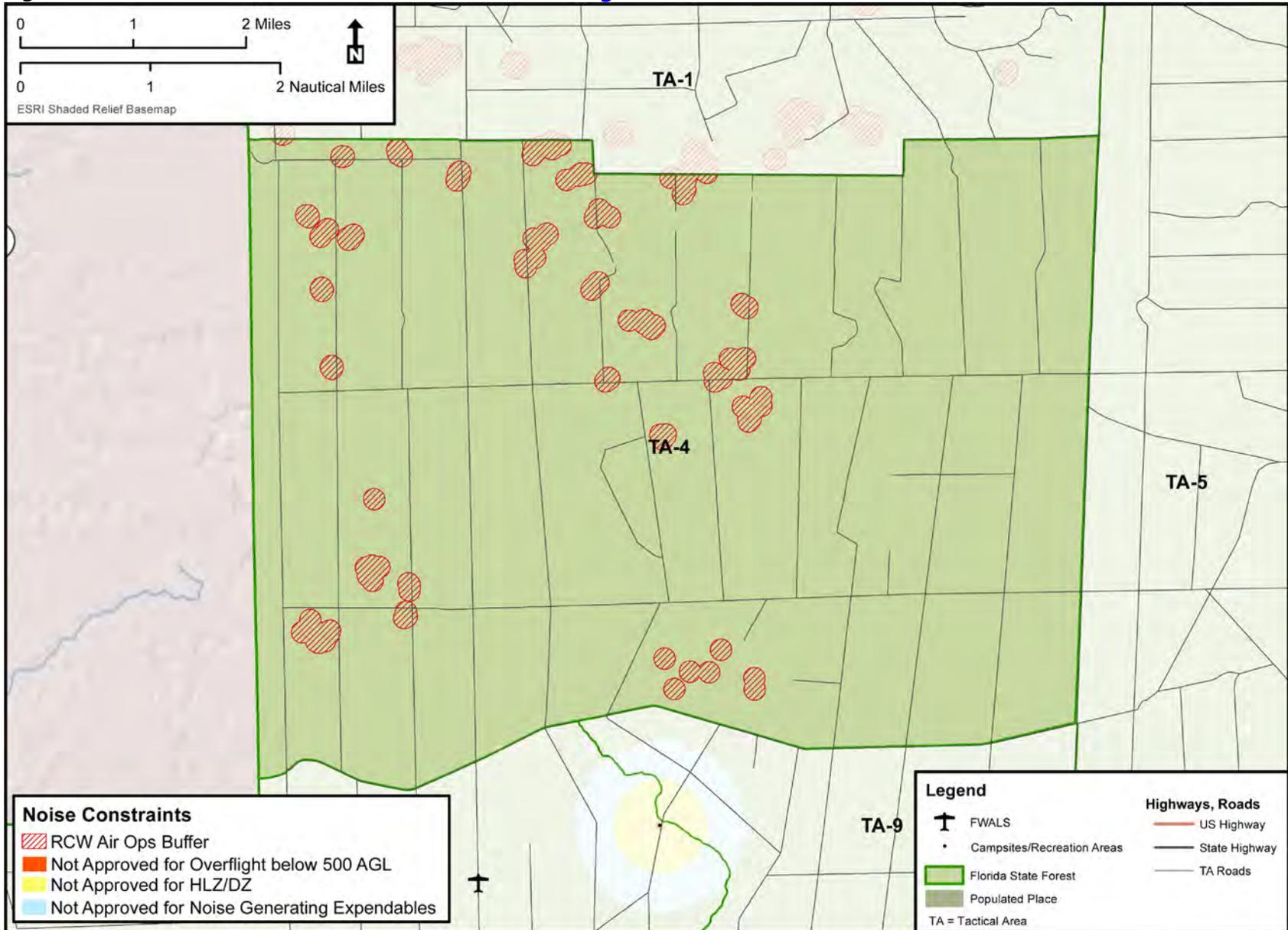


Figure 6-17. THSF TA-5 Noise Protection Levels (Return to [Figure 6-17](#))

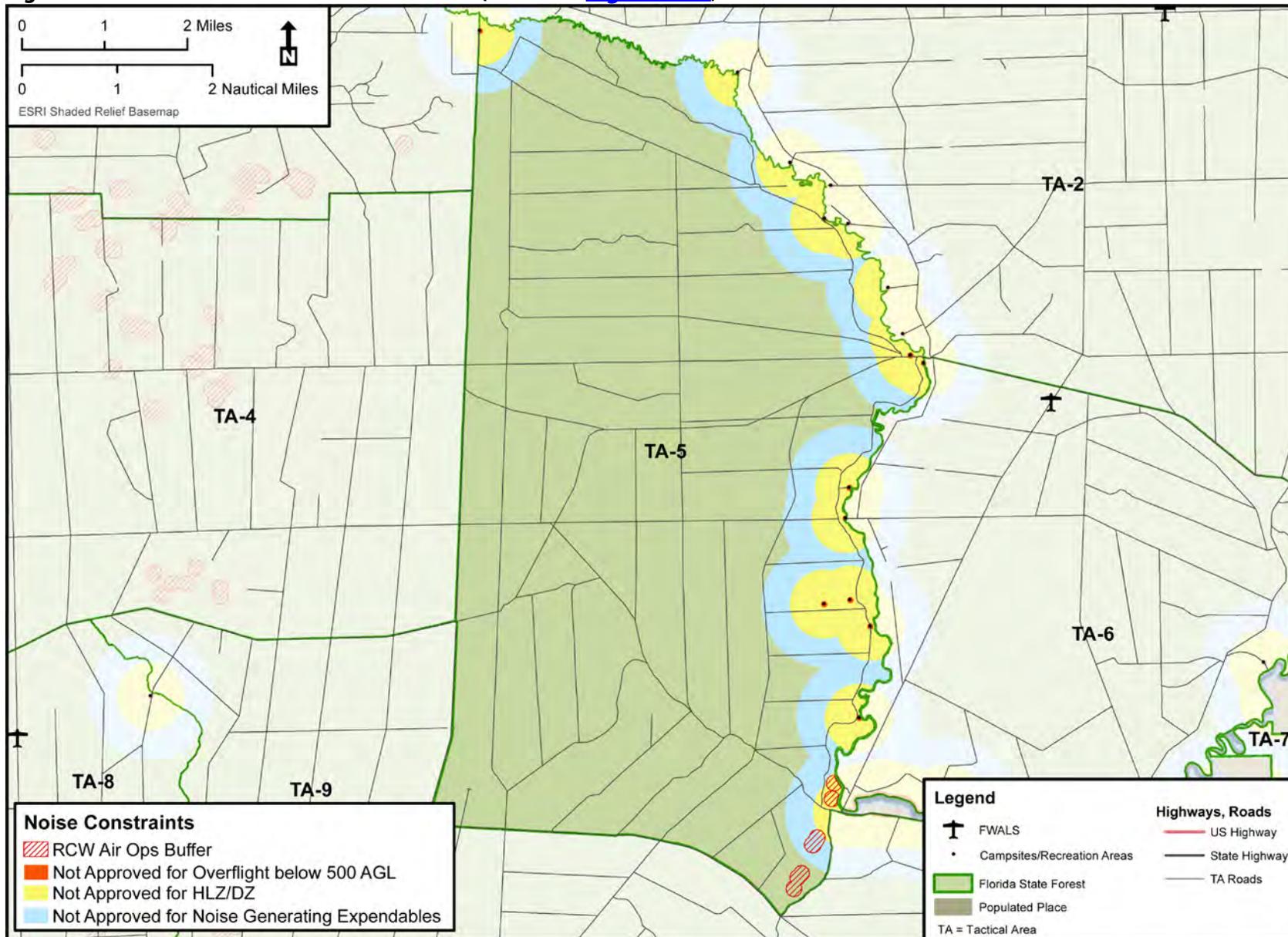
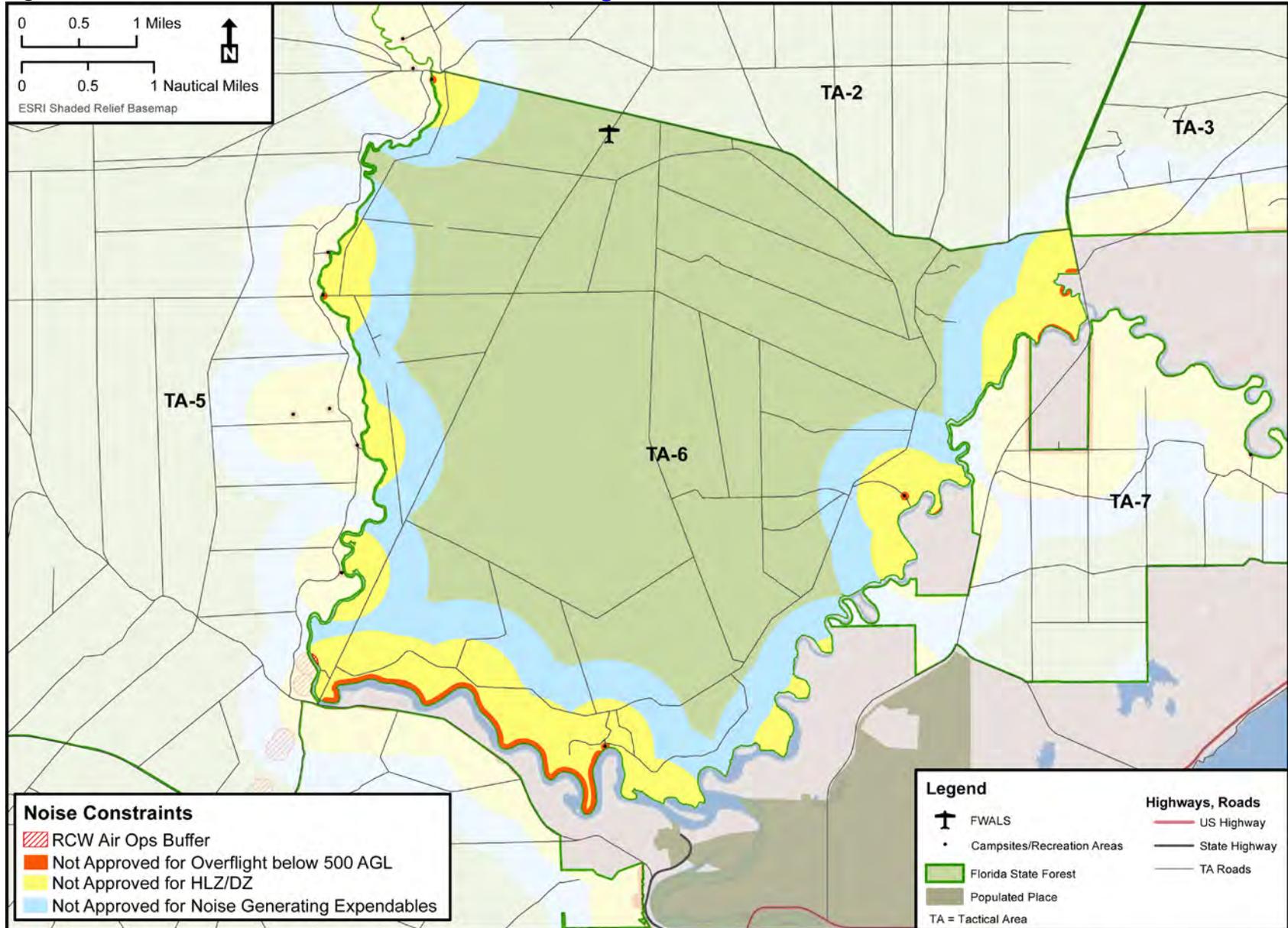


Figure 6-18. THSF TA-6 Noise Protection Levels (Return to [Figure 6-18](#))



Noise Constraints

-  RCW Air Ops Buffer
-  Not Approved for Overflight below 500 AGL
-  Not Approved for HLZ/DZ
-  Not Approved for Noise Generating Expendables

Legend

-  FWALS
 -  Campsites/Recreation Areas
 -  Florida State Forest
 -  Populated Place
 -  US Highway
 -  State Highway
 -  TA Roads
- TA = Tactical Area

Figure 6-19. THSF TA-7 Noise Protection Levels (Return to [Figure 6-19](#))

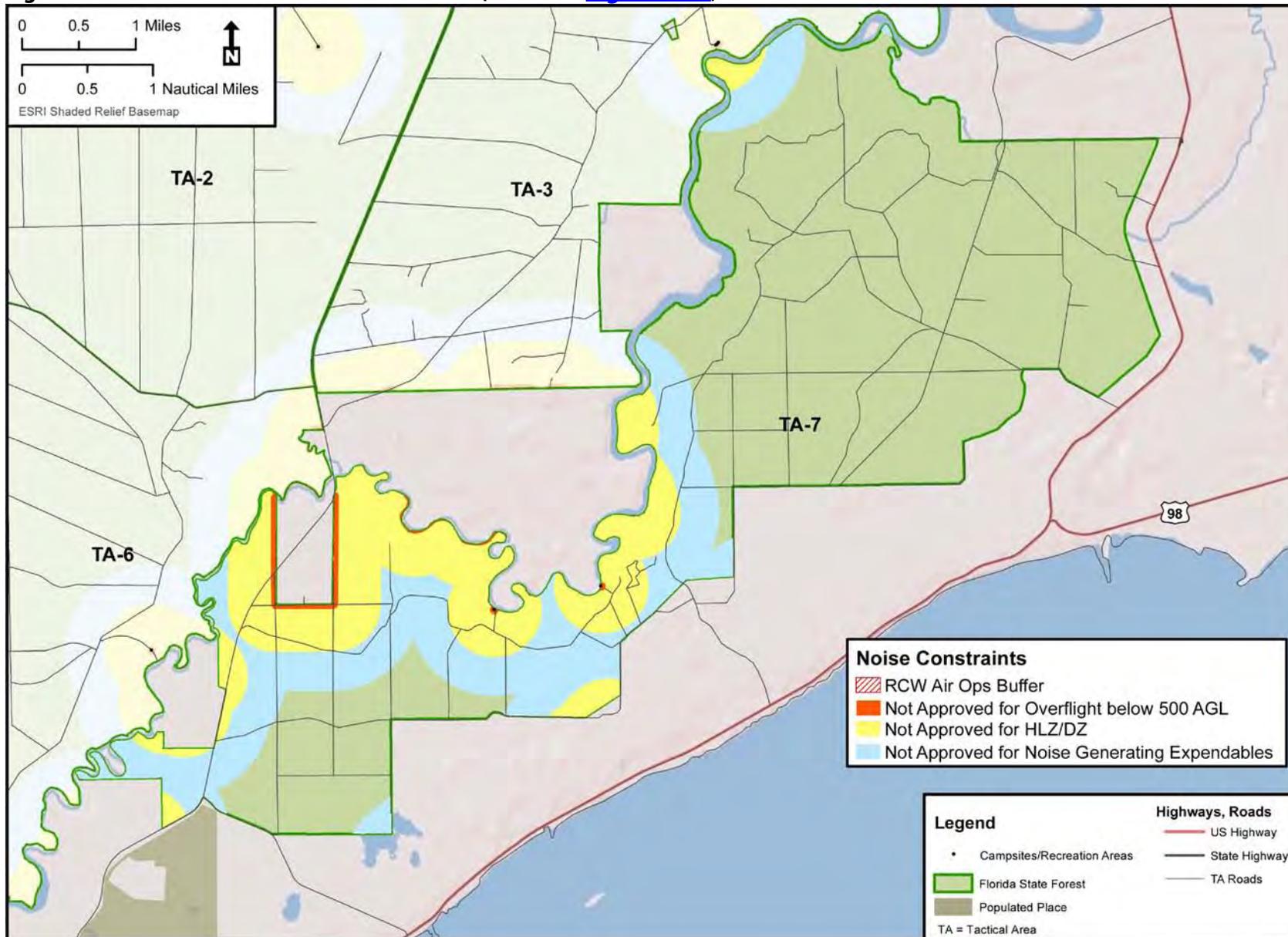


Figure 6-20. THSF TA-8 Noise Protection Levels (Return to [Figure 6-20](#))

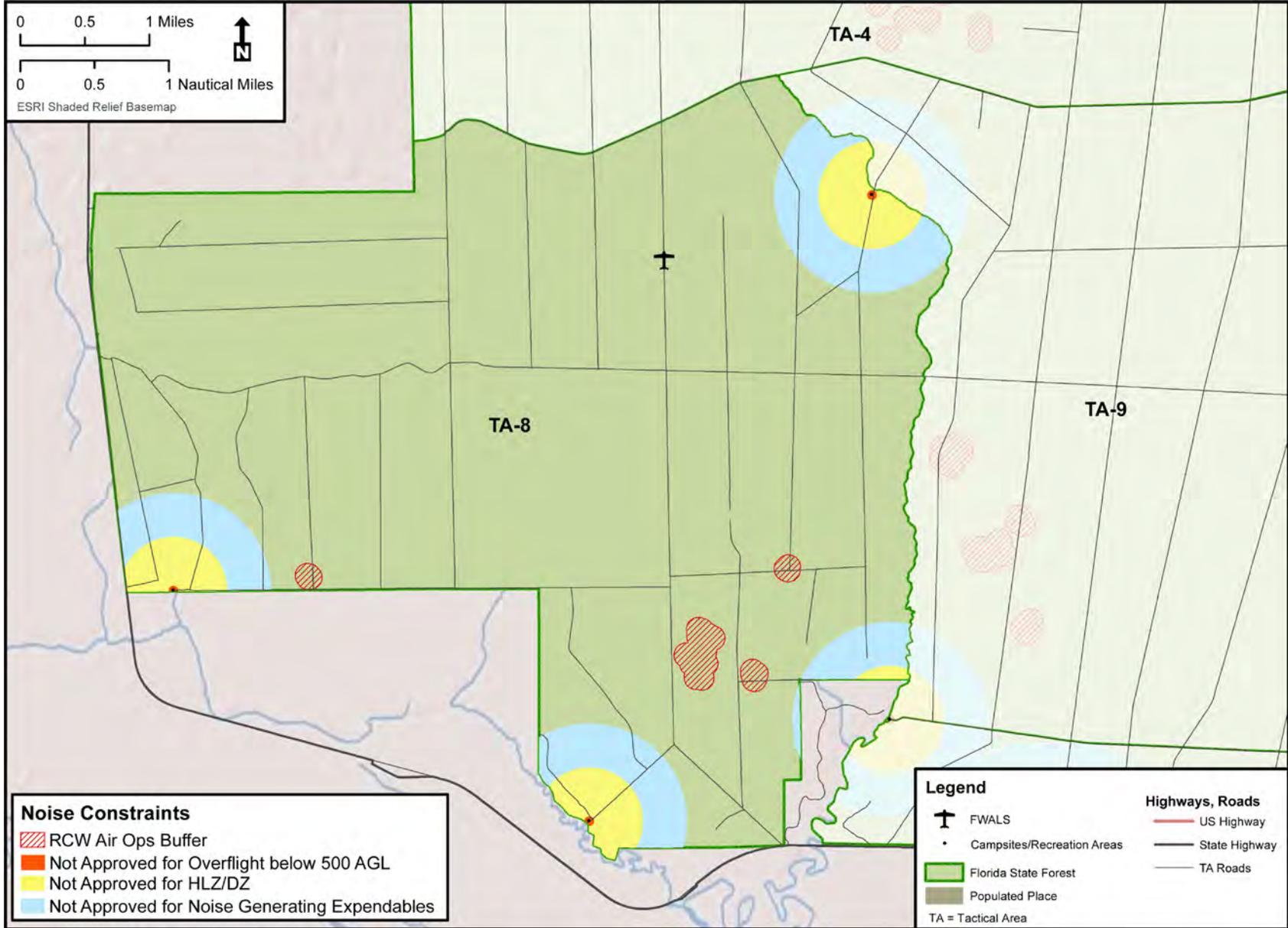


Figure 6-21. THSF TA-9 Noise Protection Levels (Return to [Figure 6-21](#))

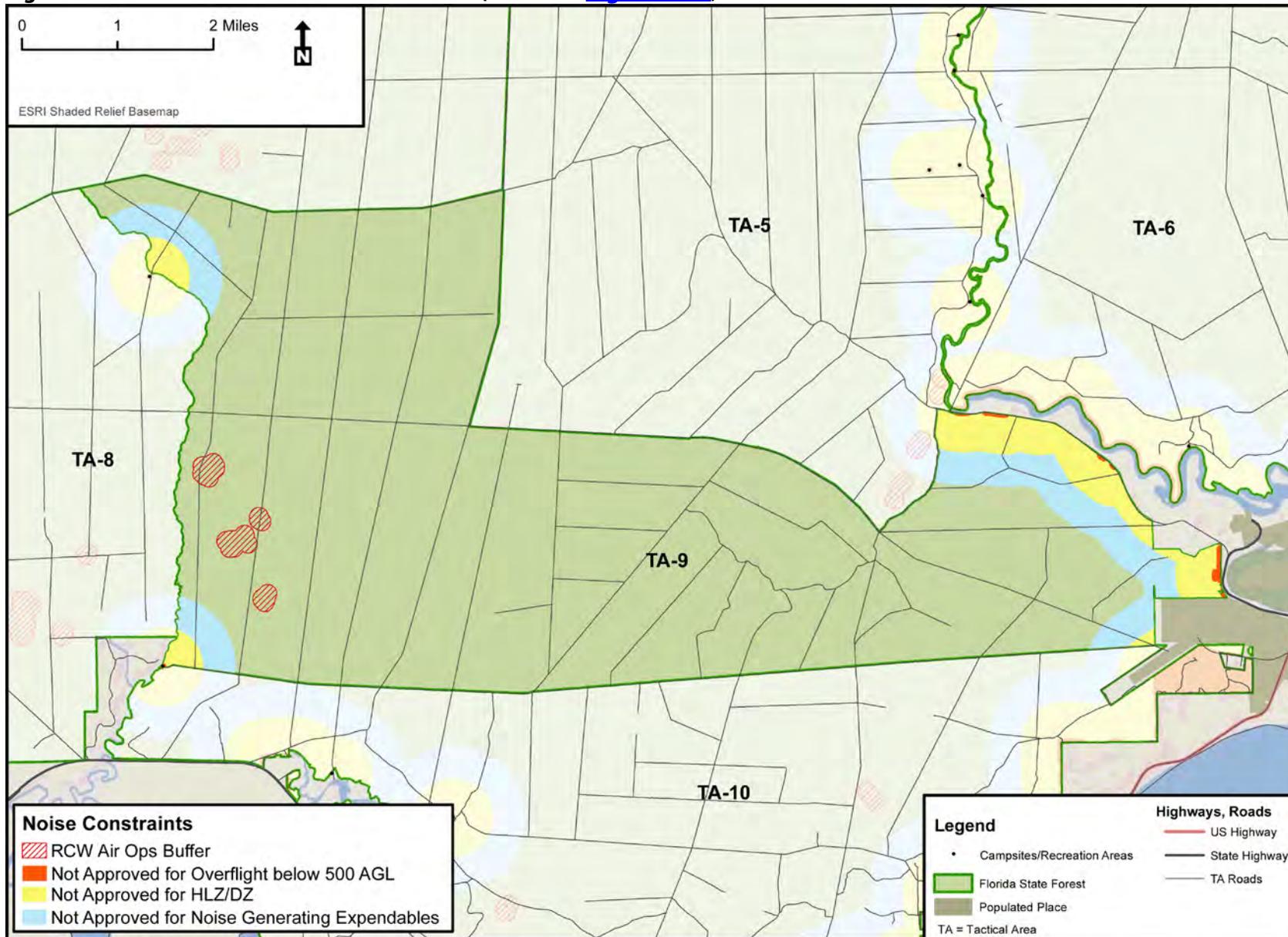


Figure 6-22. THSF TA-10 Noise Protection Levels (Return to [Figure 6-22](#))

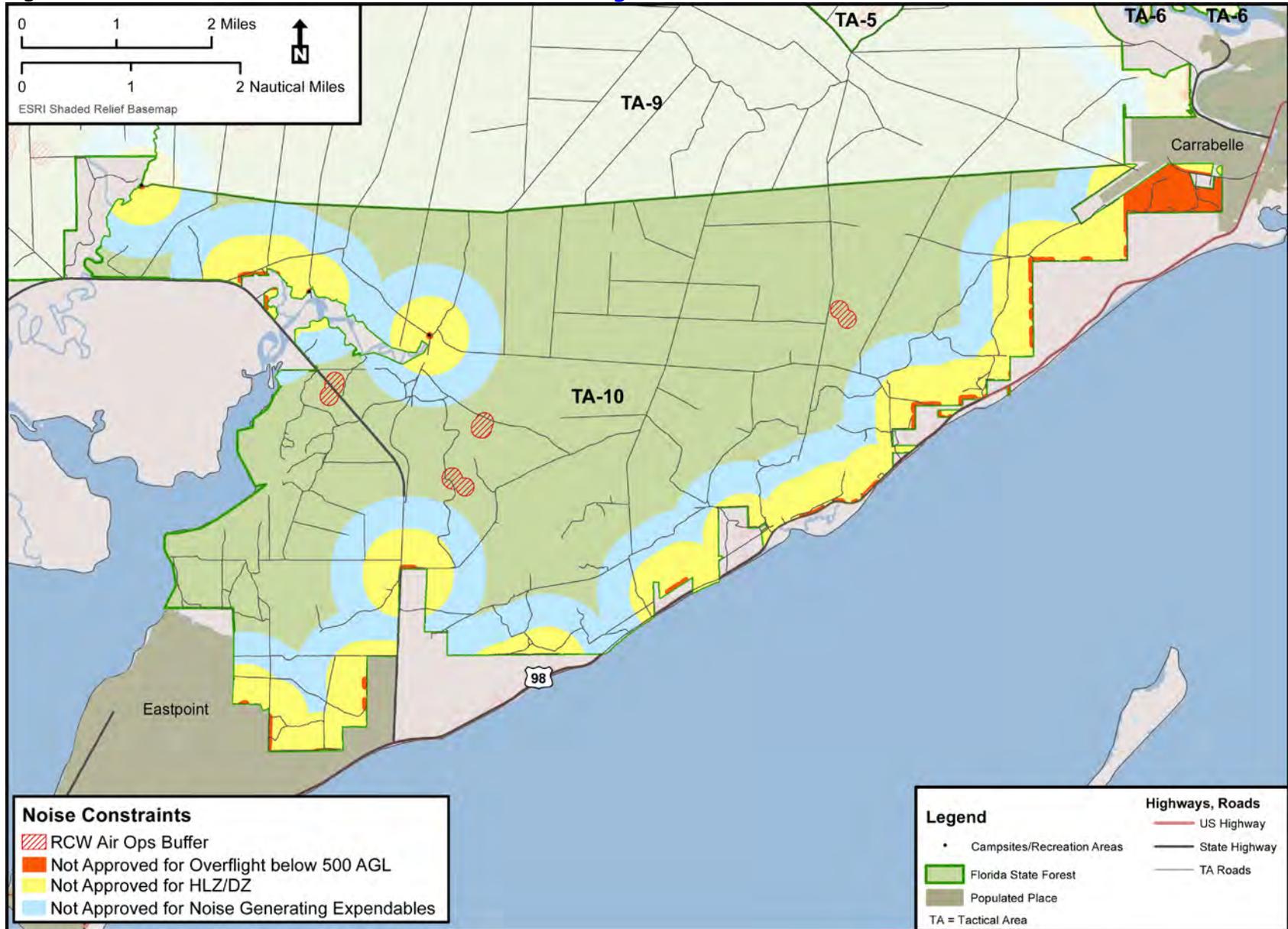
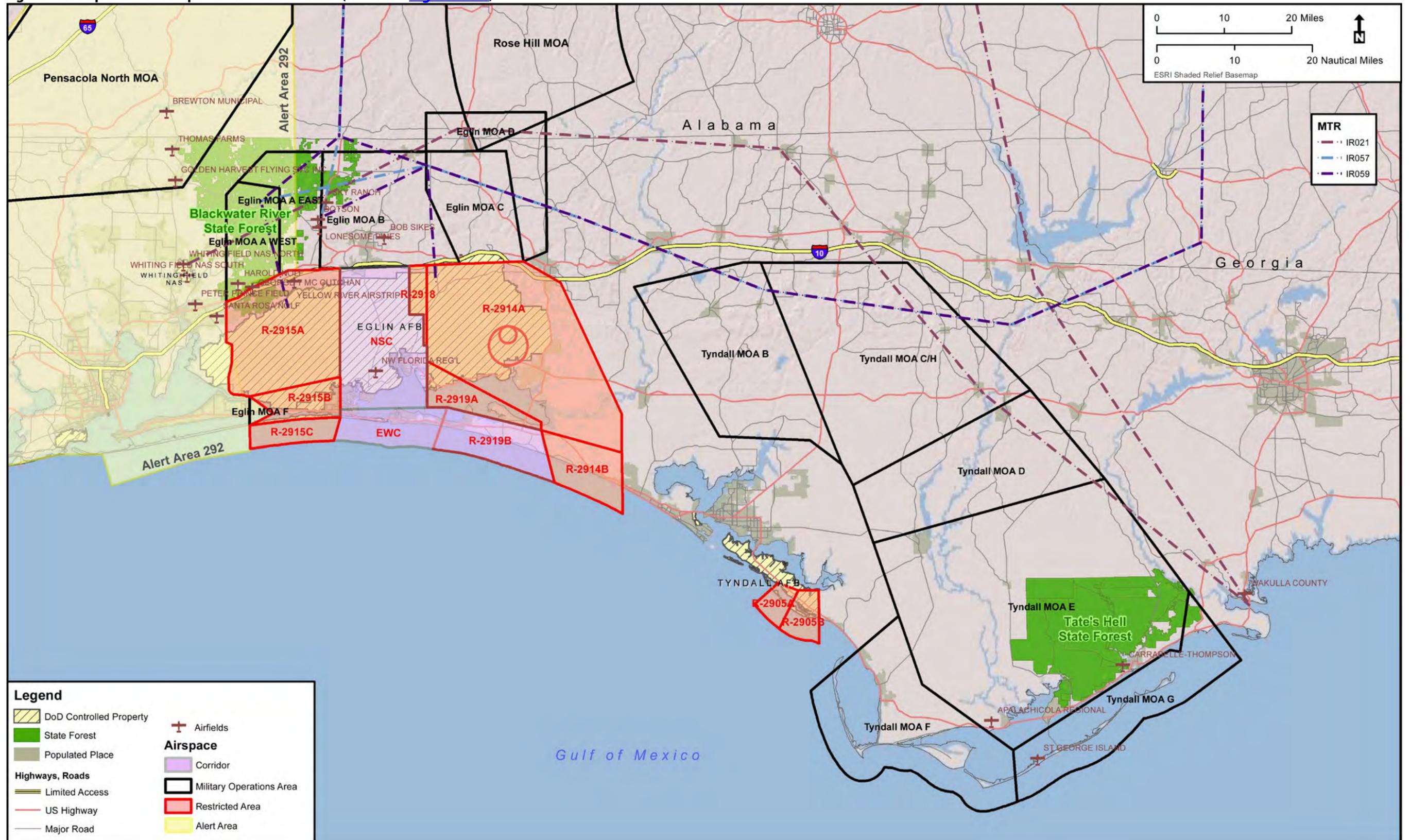


Figure 6-23. Special Use Airspace Units and Airfields (Return to [Figure 6-23](#))



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Figure 6-24. THSF Sensitive Karst Areas, Closed Depressions, and Gulf Coastline (Return to [Figure 6-24](#))

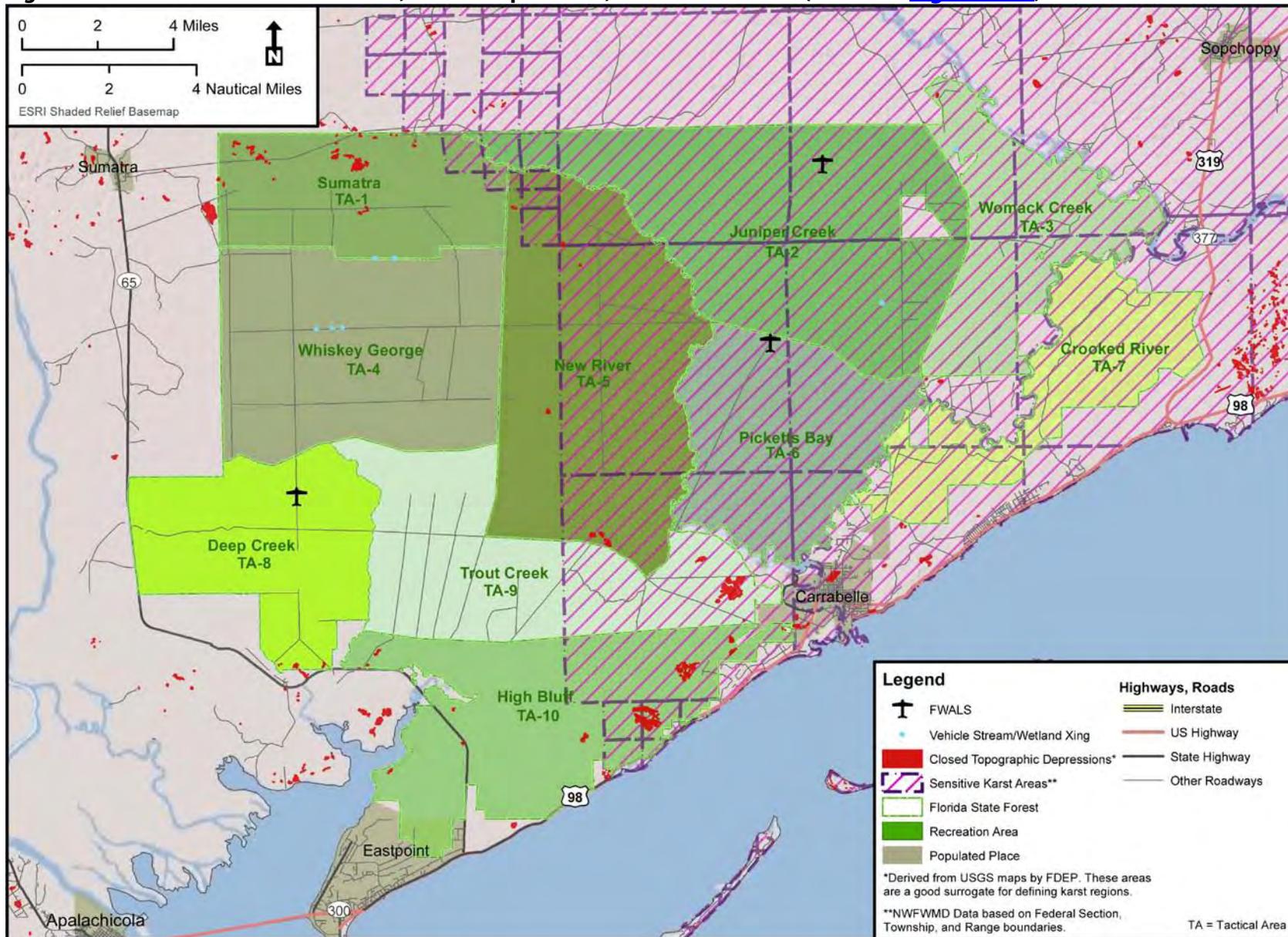


Figure 6-25. THSF Soil Suborders (Return to [Figure 6-25](#))

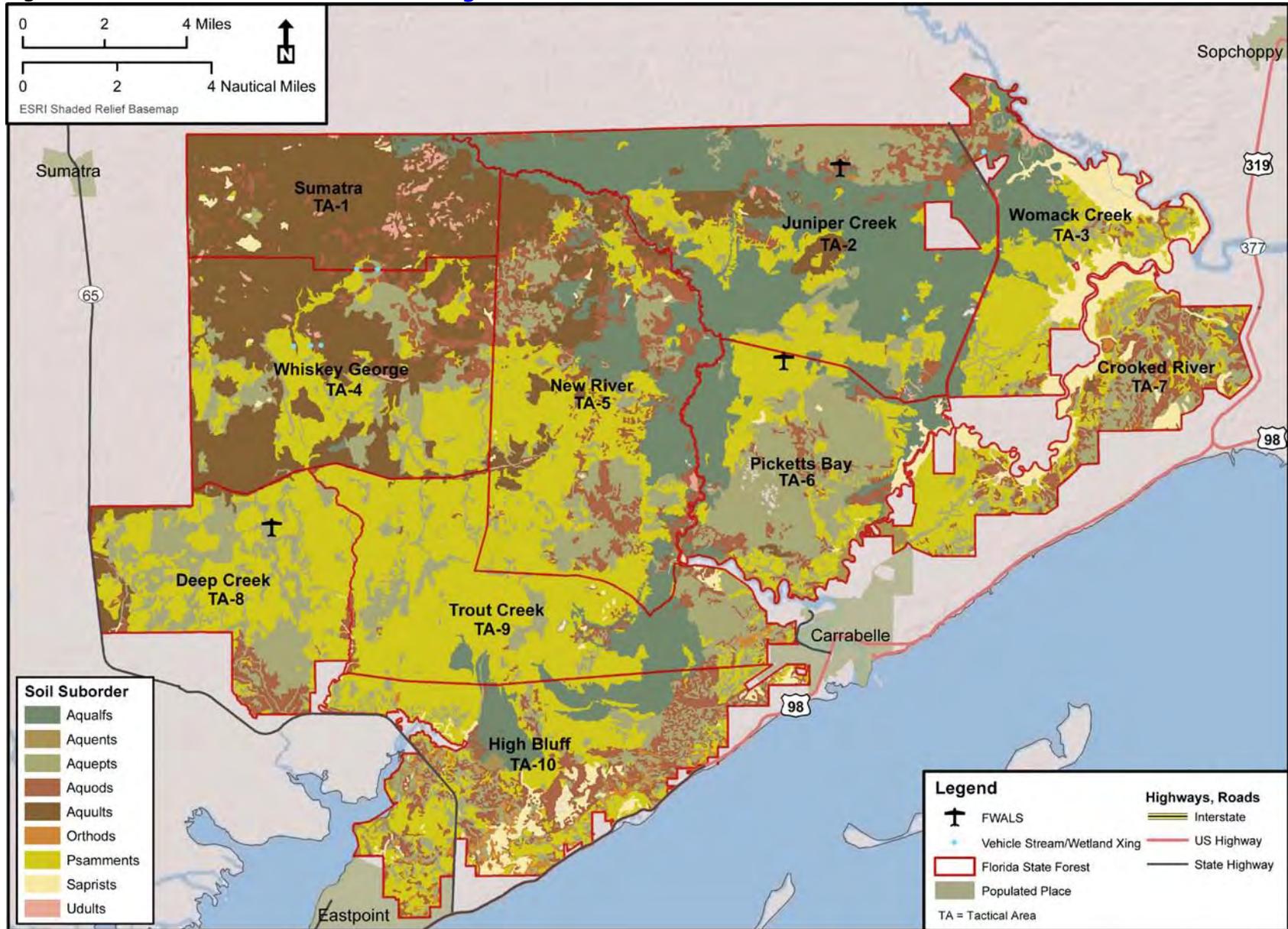


Figure 6-26. THSF Hydric Soils (Return to [Figure 6-26](#))

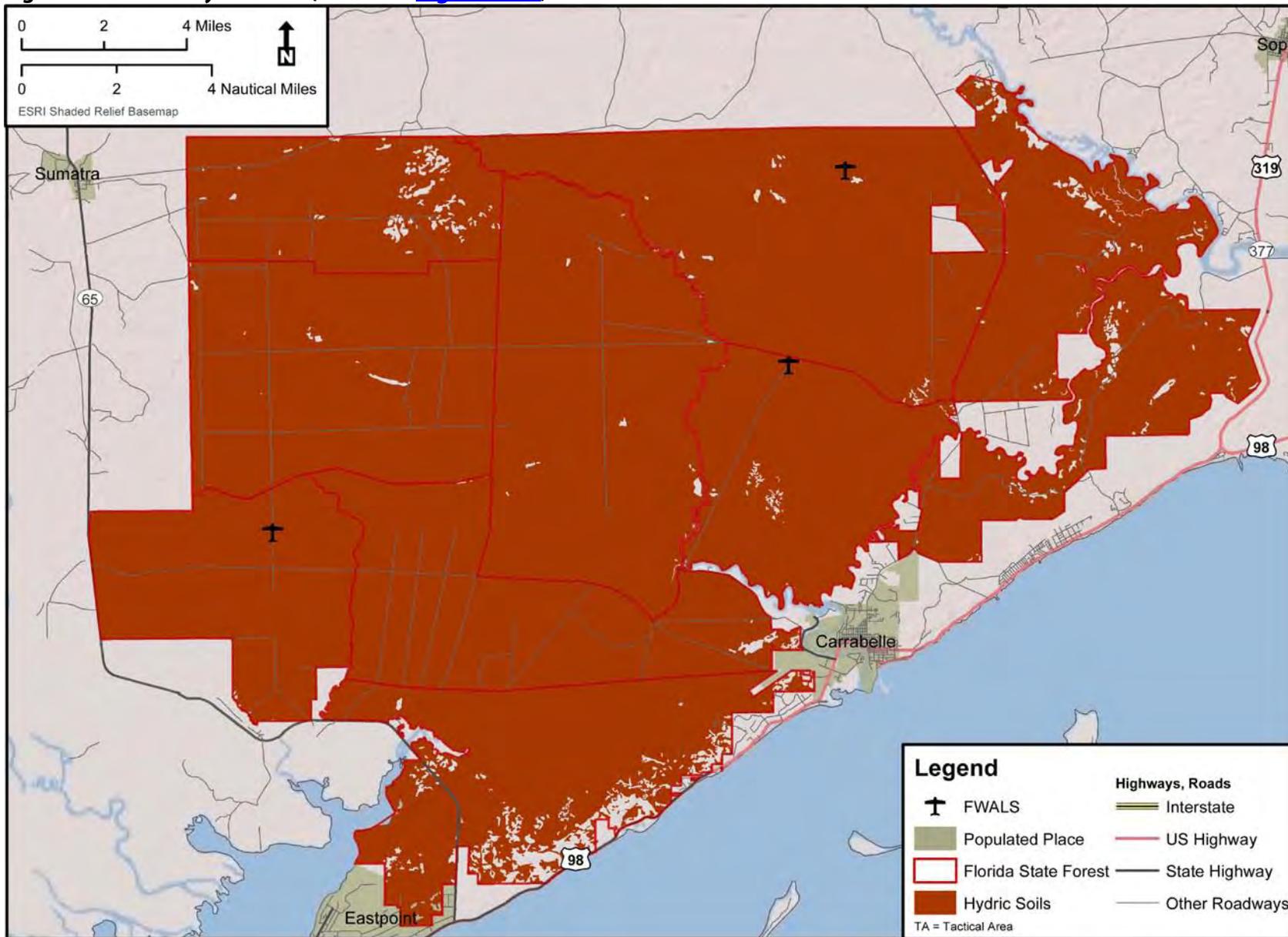


Figure 6-27. THSF Unpaved Roads and Crossings (Return to [Figure 6-27](#))

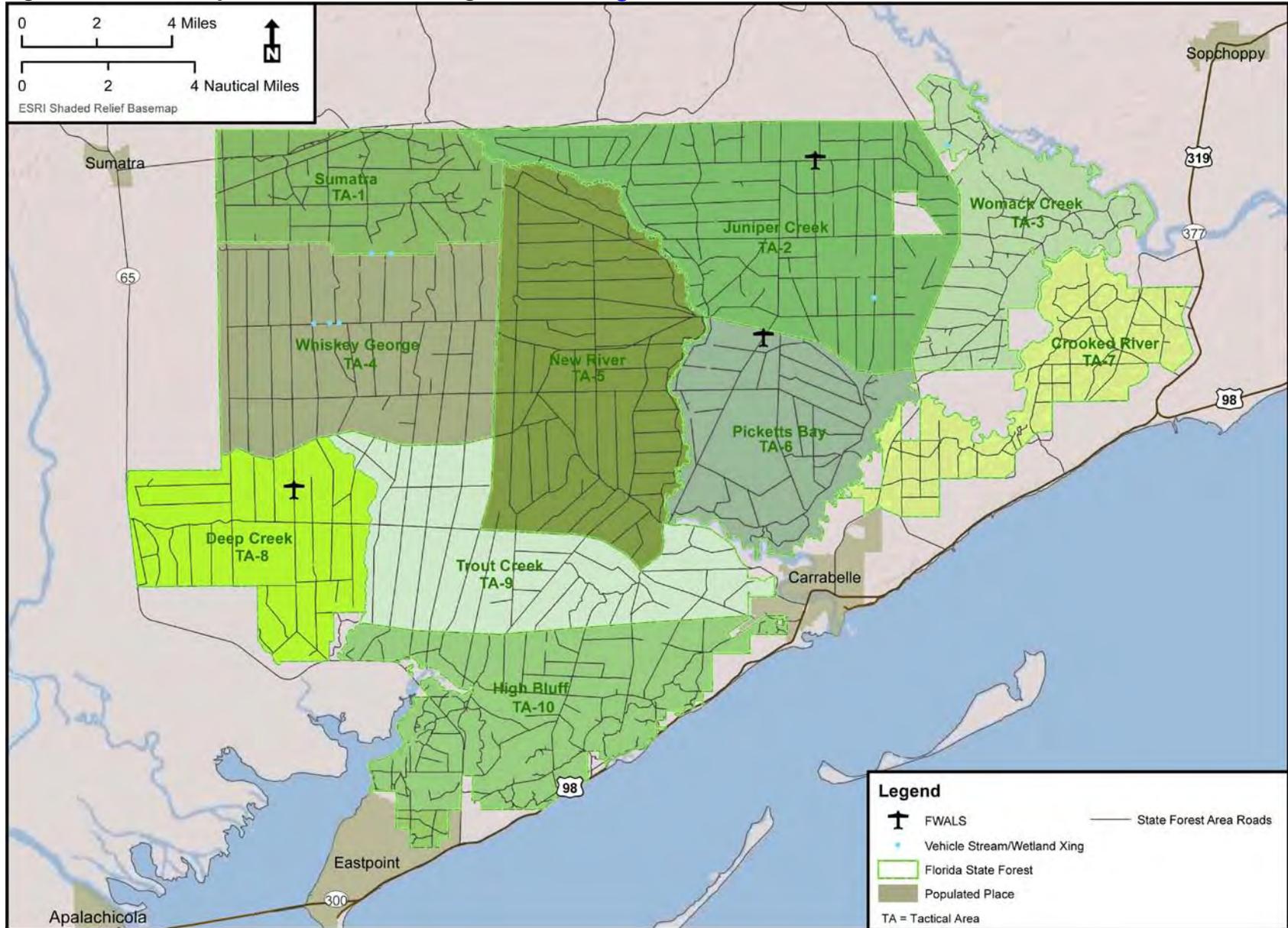


Figure 6-28. THSF Bivouac Constraint Areas (Return to [Figure 6-28](#))

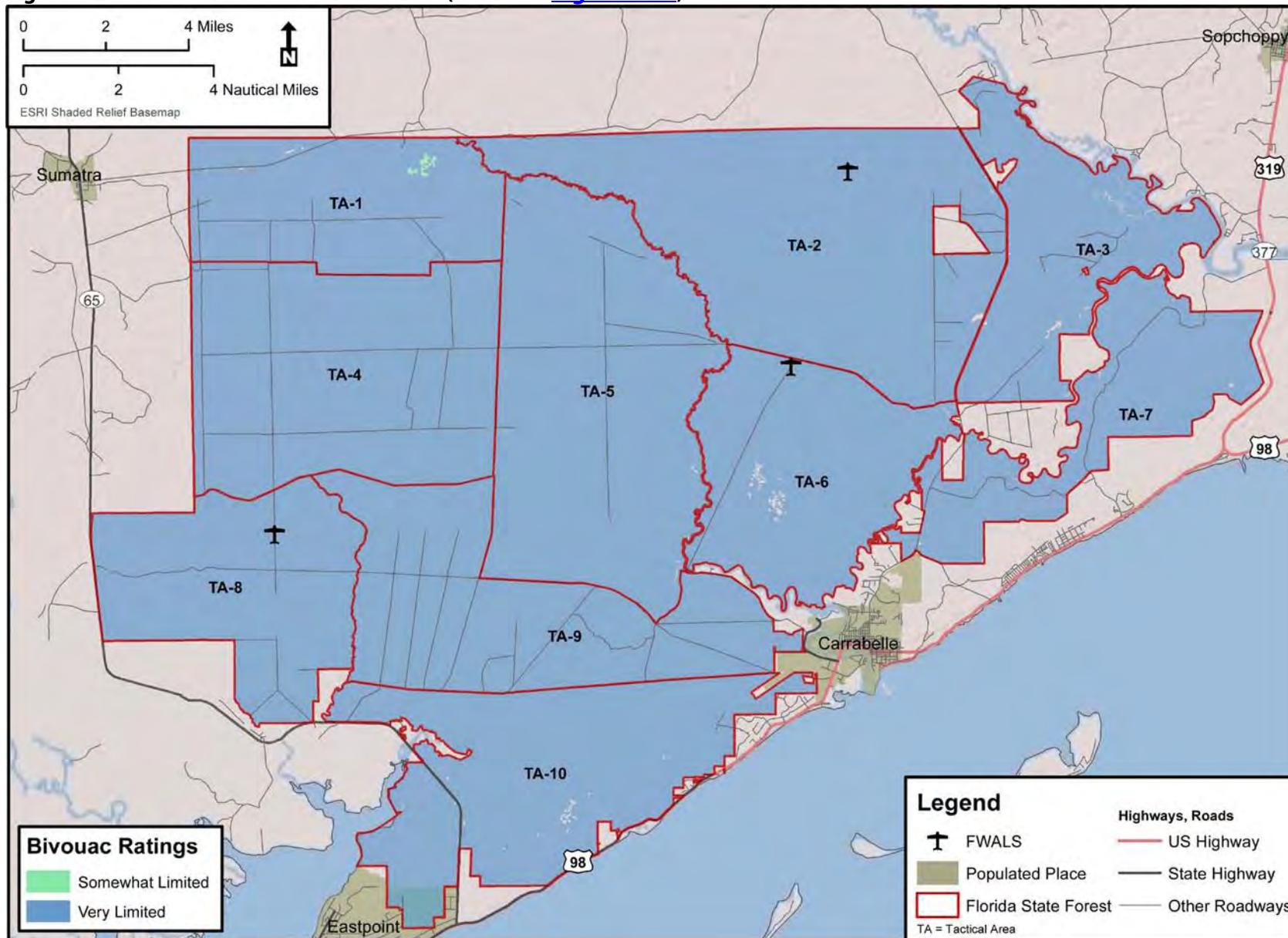


Figure 6-29. THSF Helicopter Landing Zone Constraint Areas (Return to [Figure 6-29](#))

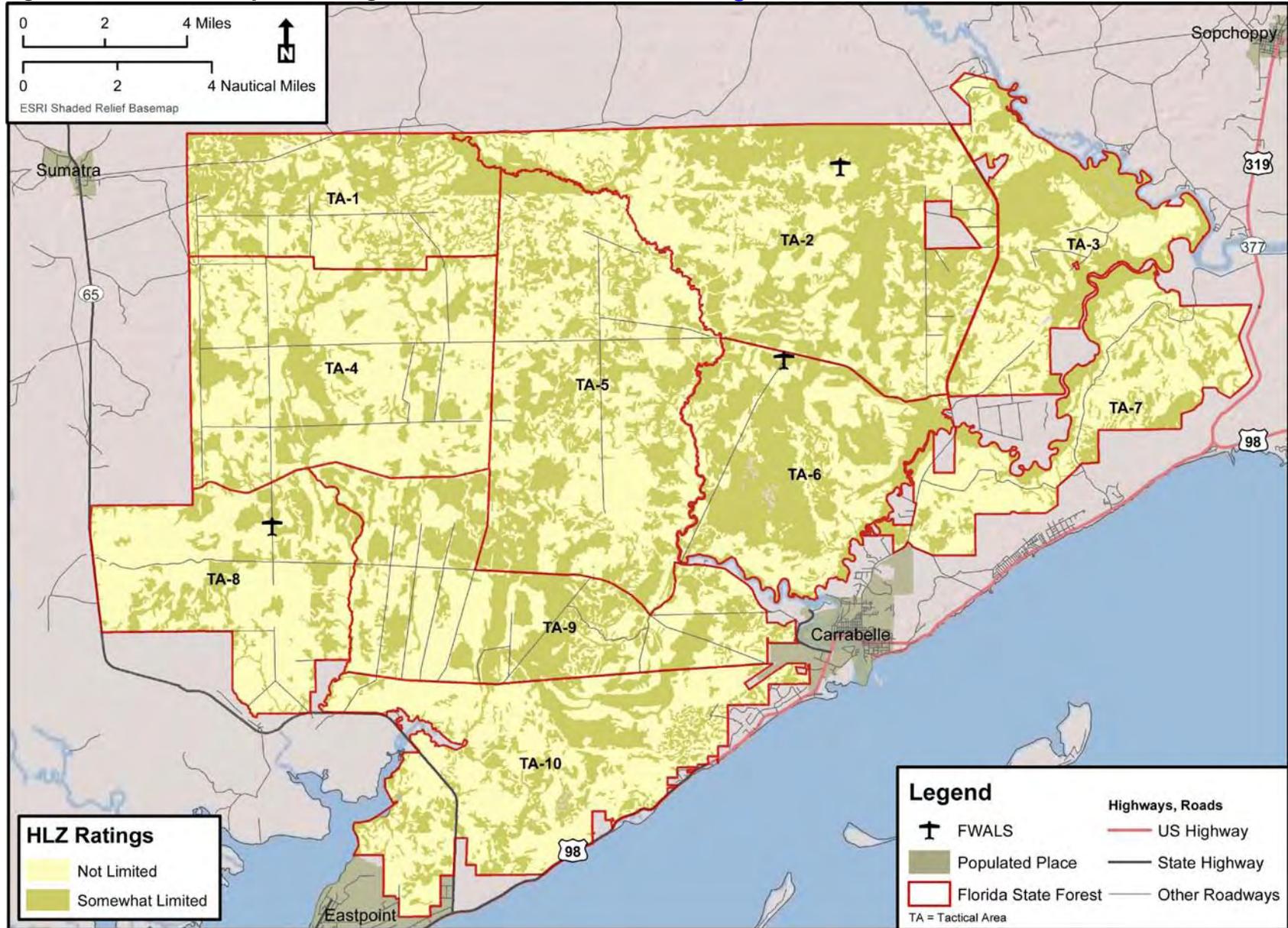


Figure 6-30. Water and Biological Resources at THSF – Overview (Return to [Figure 6-30](#))

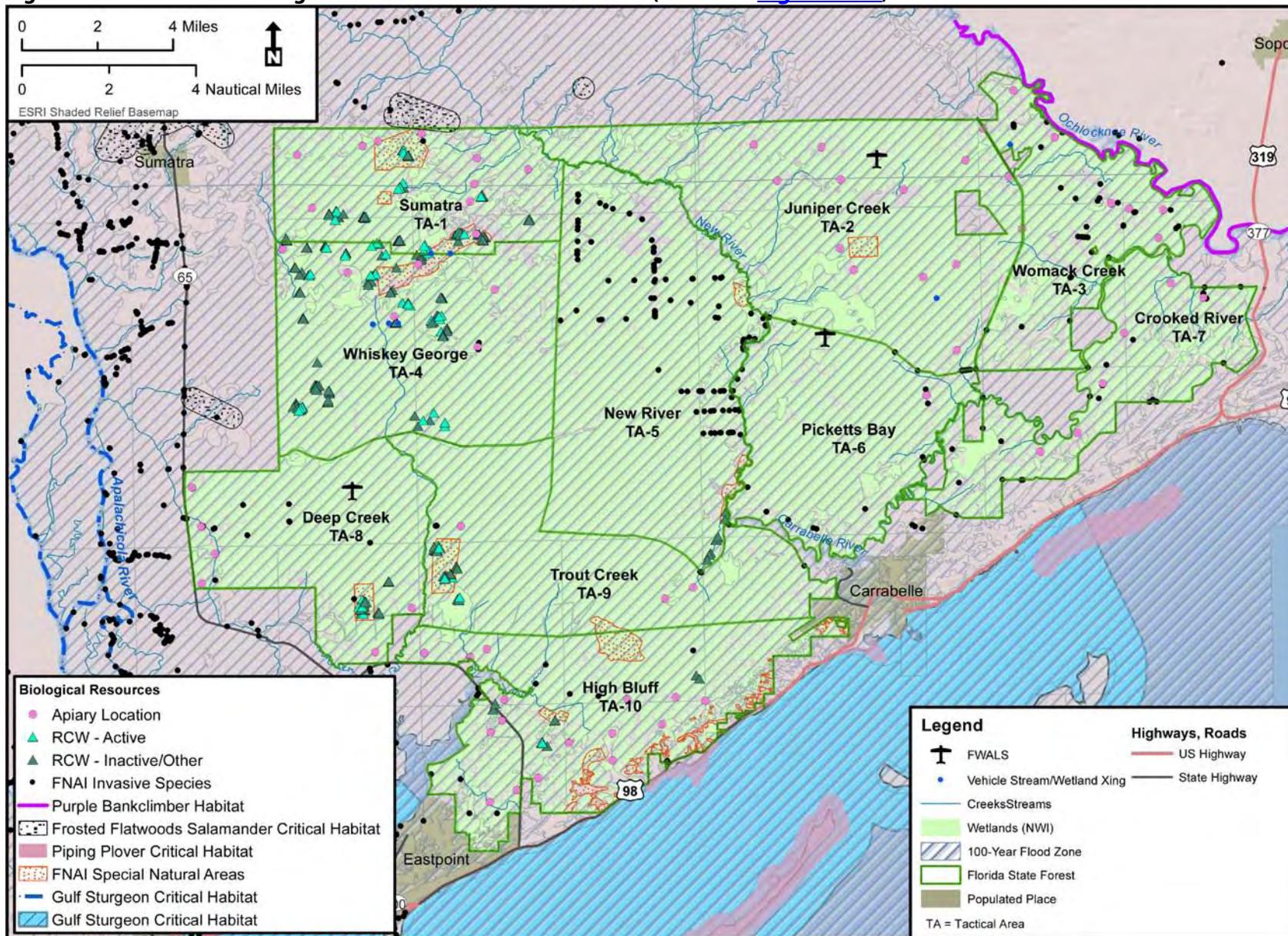


Figure 6-31. Water and Biological Resources – TA-1 at THSF (Return to [Figure 6-31](#))

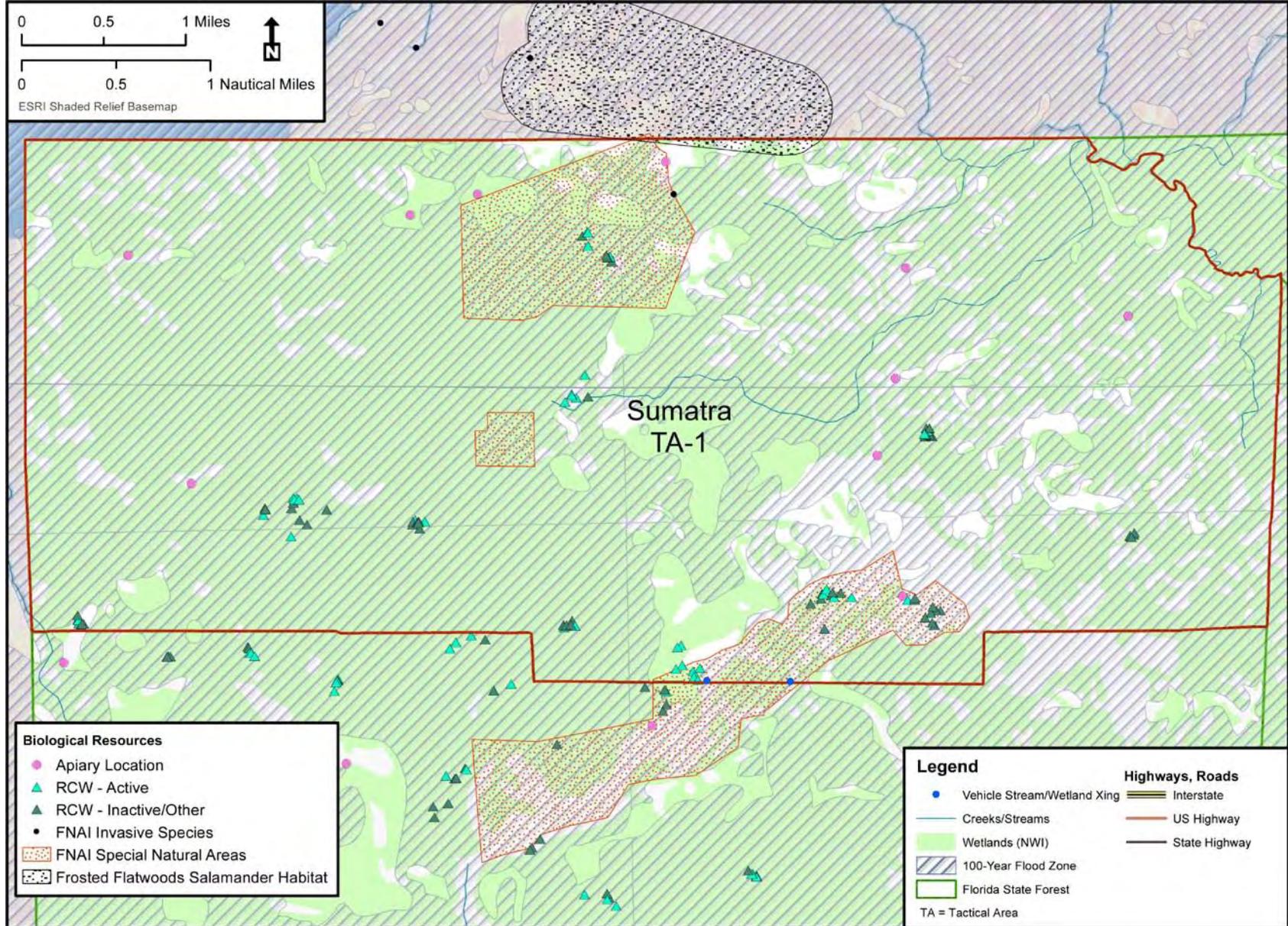


Figure 6-32. Water and Biological Resources – TA-2 at THSF (Return to [Figure 6-32](#))

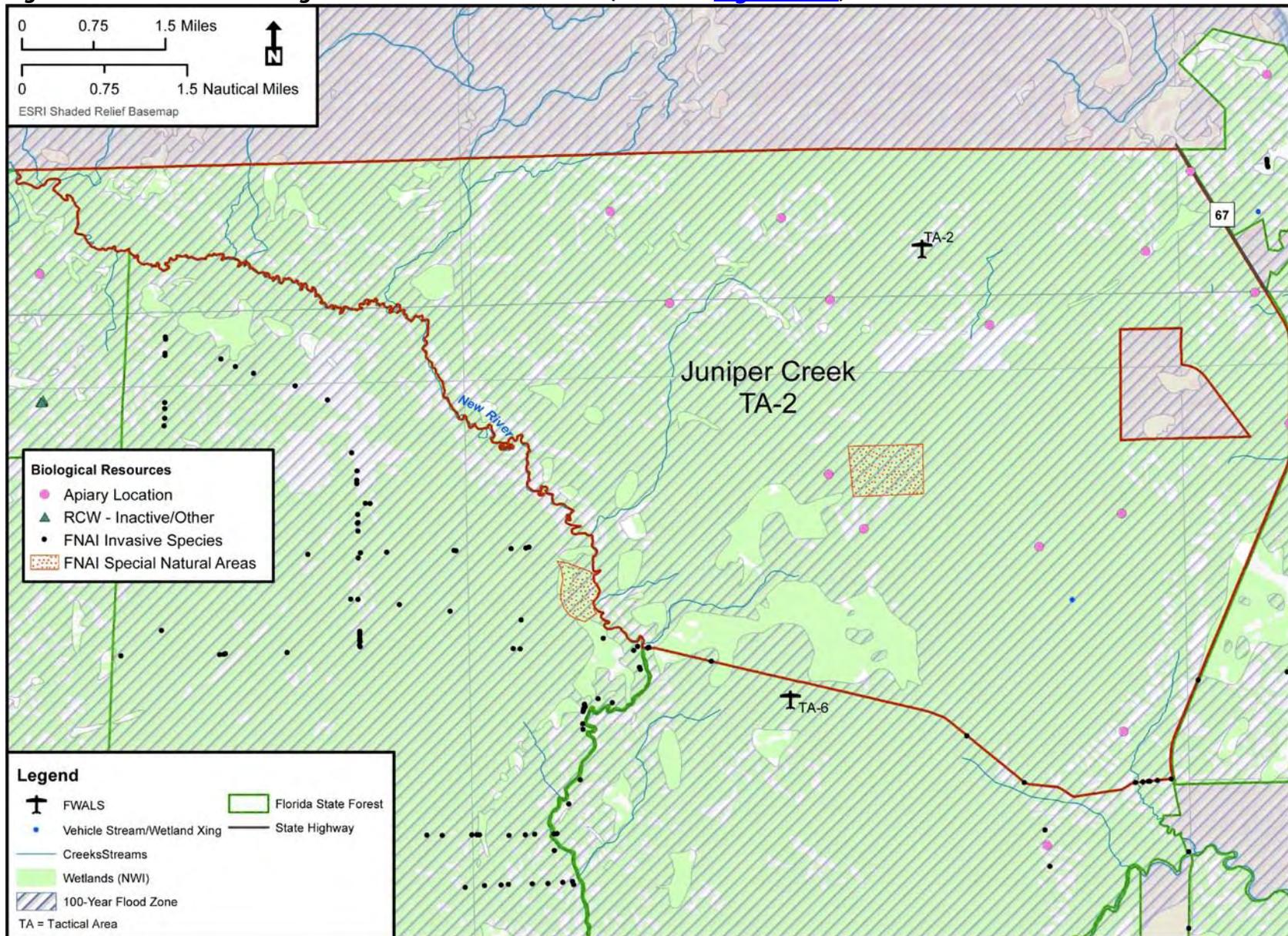


Figure 6-33. Water and Biological Resources – TA-3 at THSF (Return to [Figure 6-33](#))

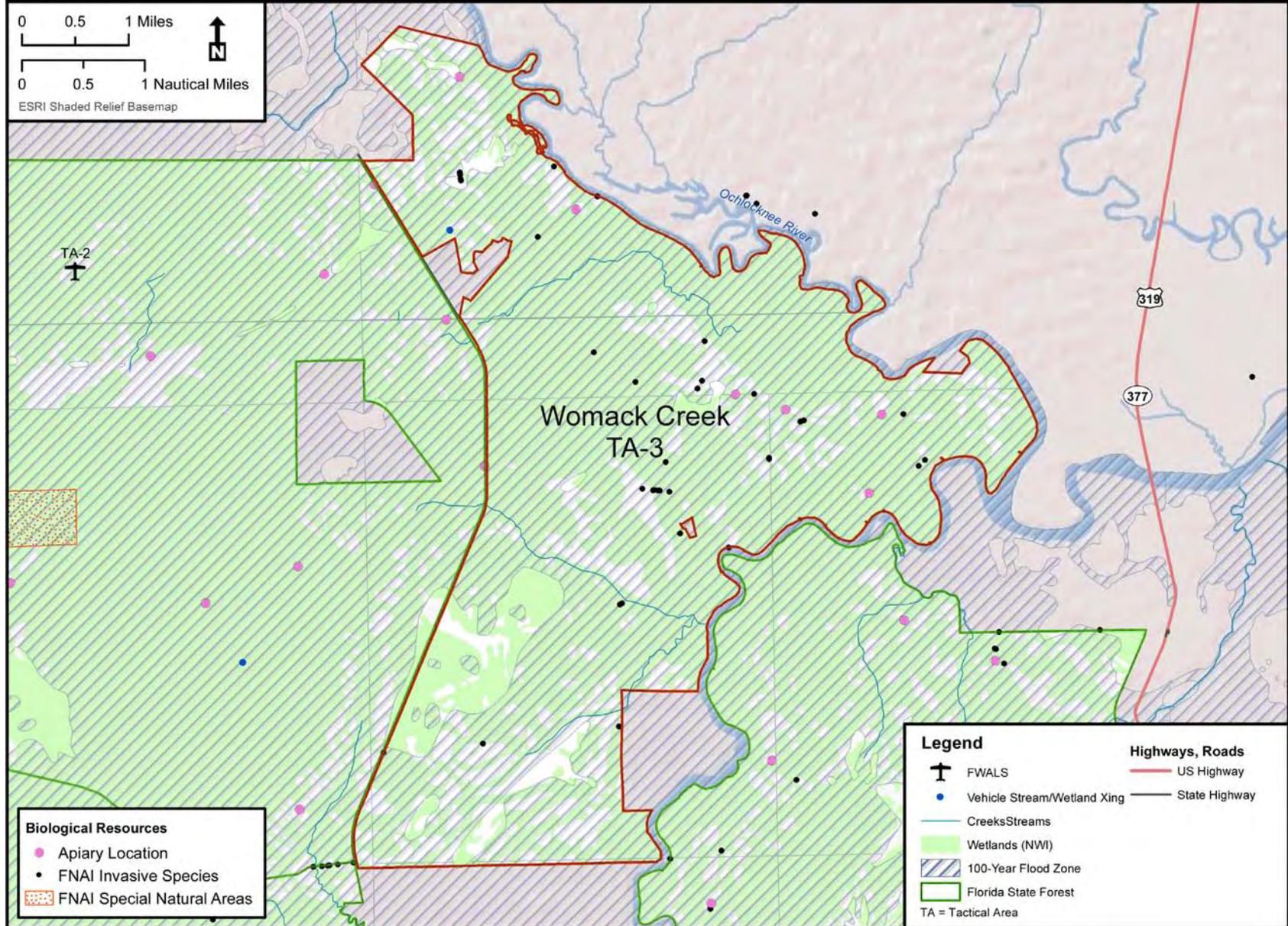


Figure 6-34. Water and Biological Resources – TA-4 at THSF (Return to [Figure 6-34](#))

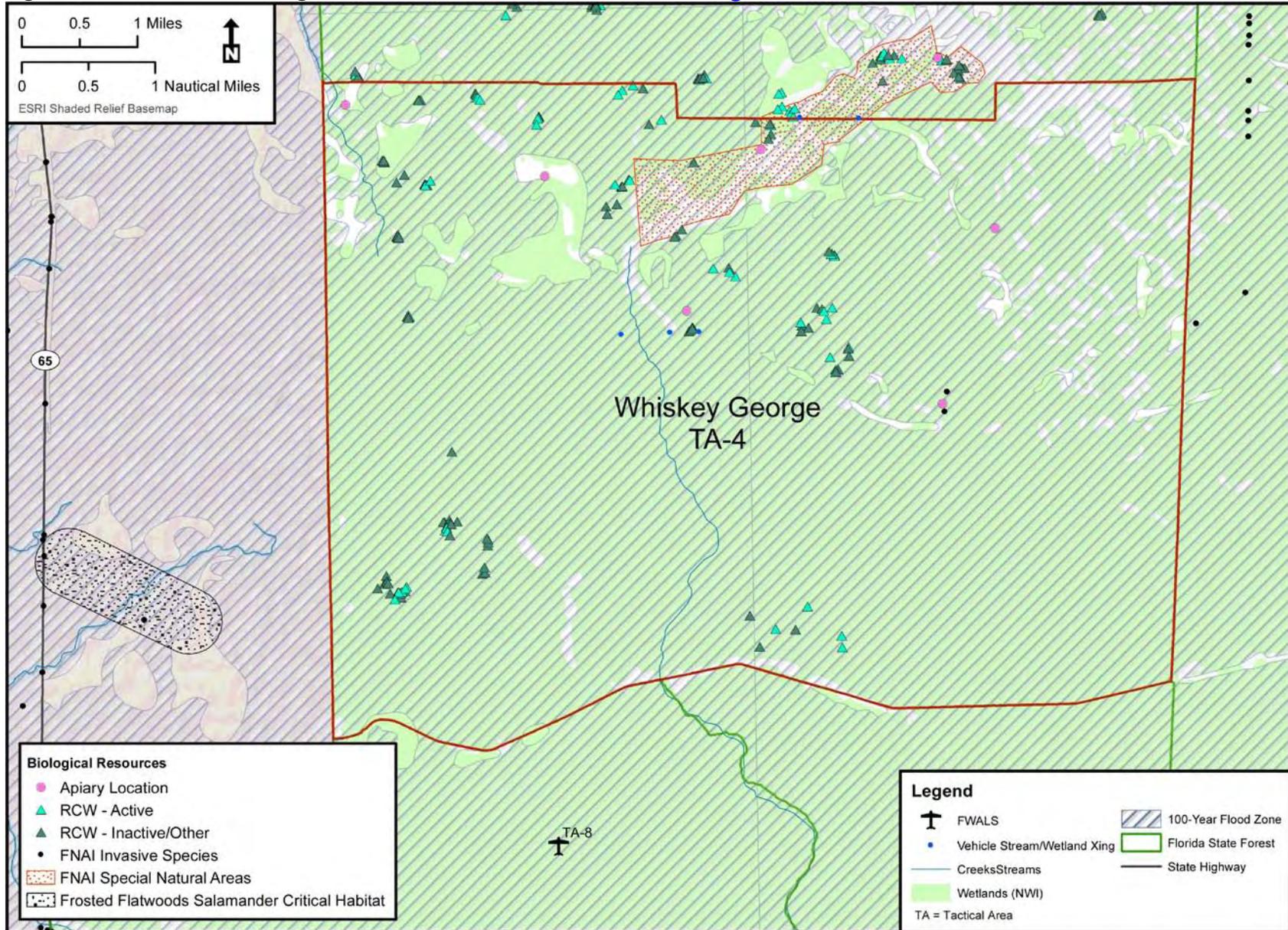


Figure 6-35. Water and Biological Resources – TA-5 at THSF (Return to [Figure 6-35](#))

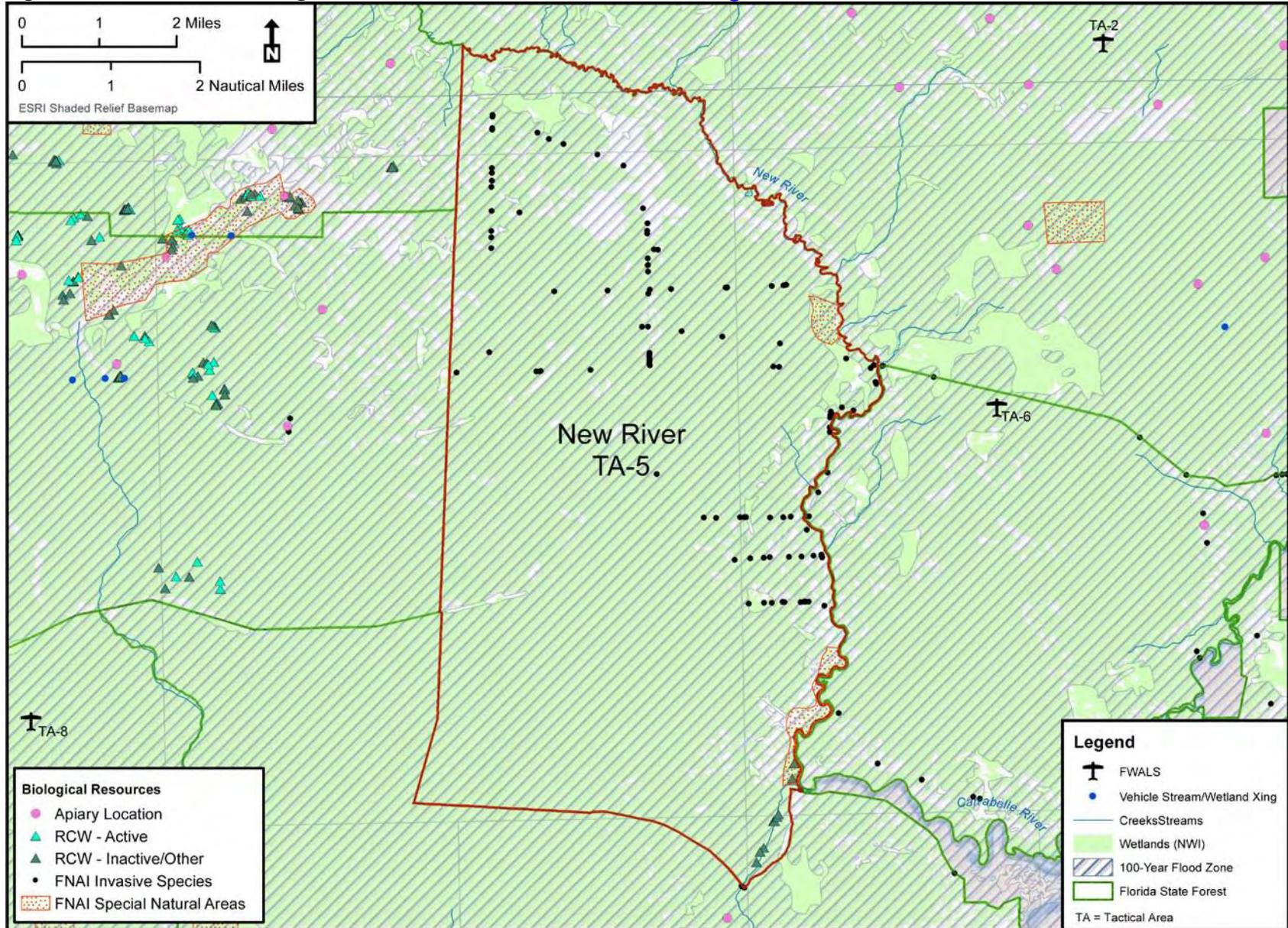


Figure 6-36. Water and Biological Resources – TA-6 at THSF (Return to [Figure 6-36](#))

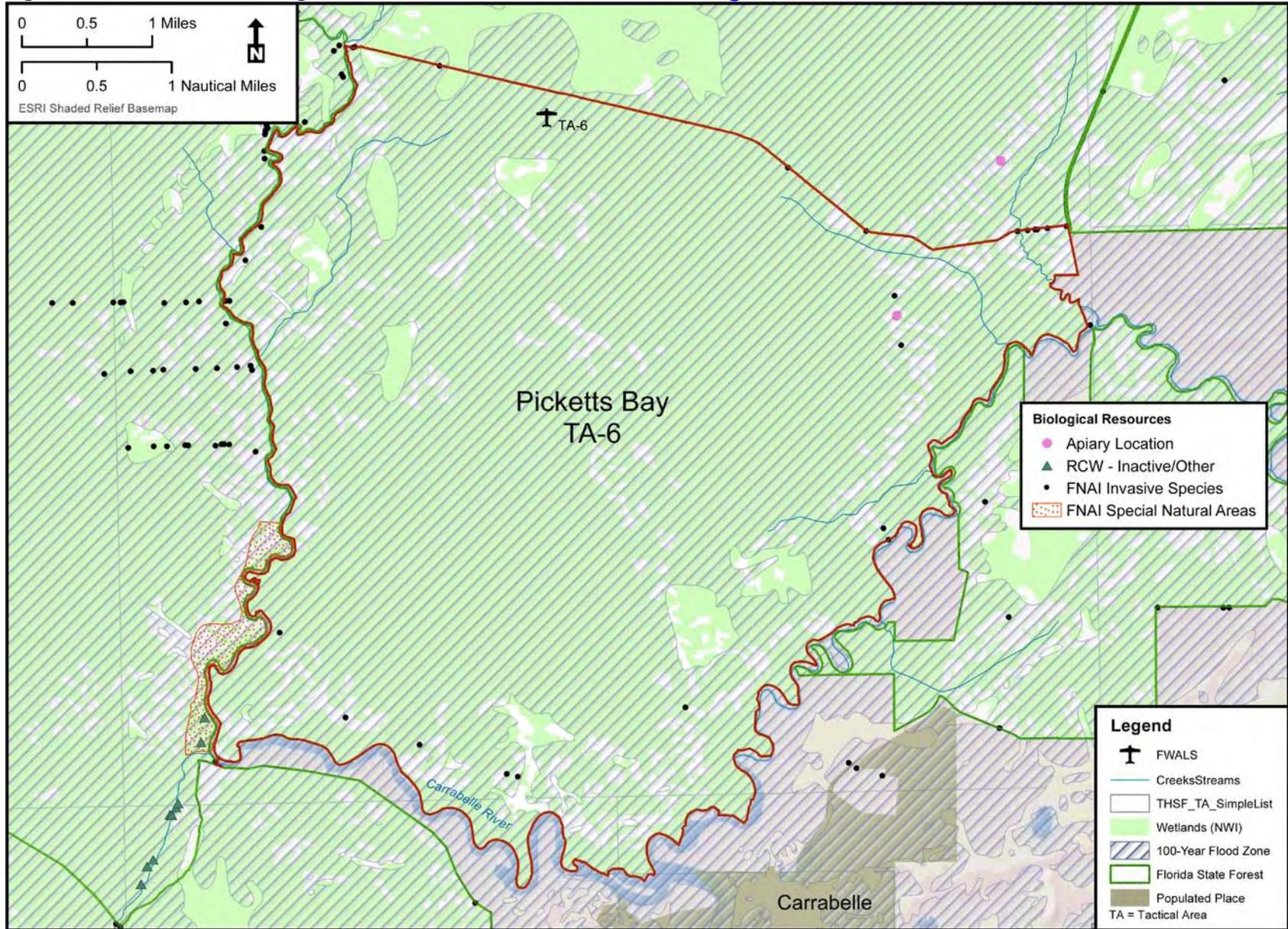


Figure 6-37. Water and Biological Resources – TA-7 at THSF (Return to [Figure 6-37](#))

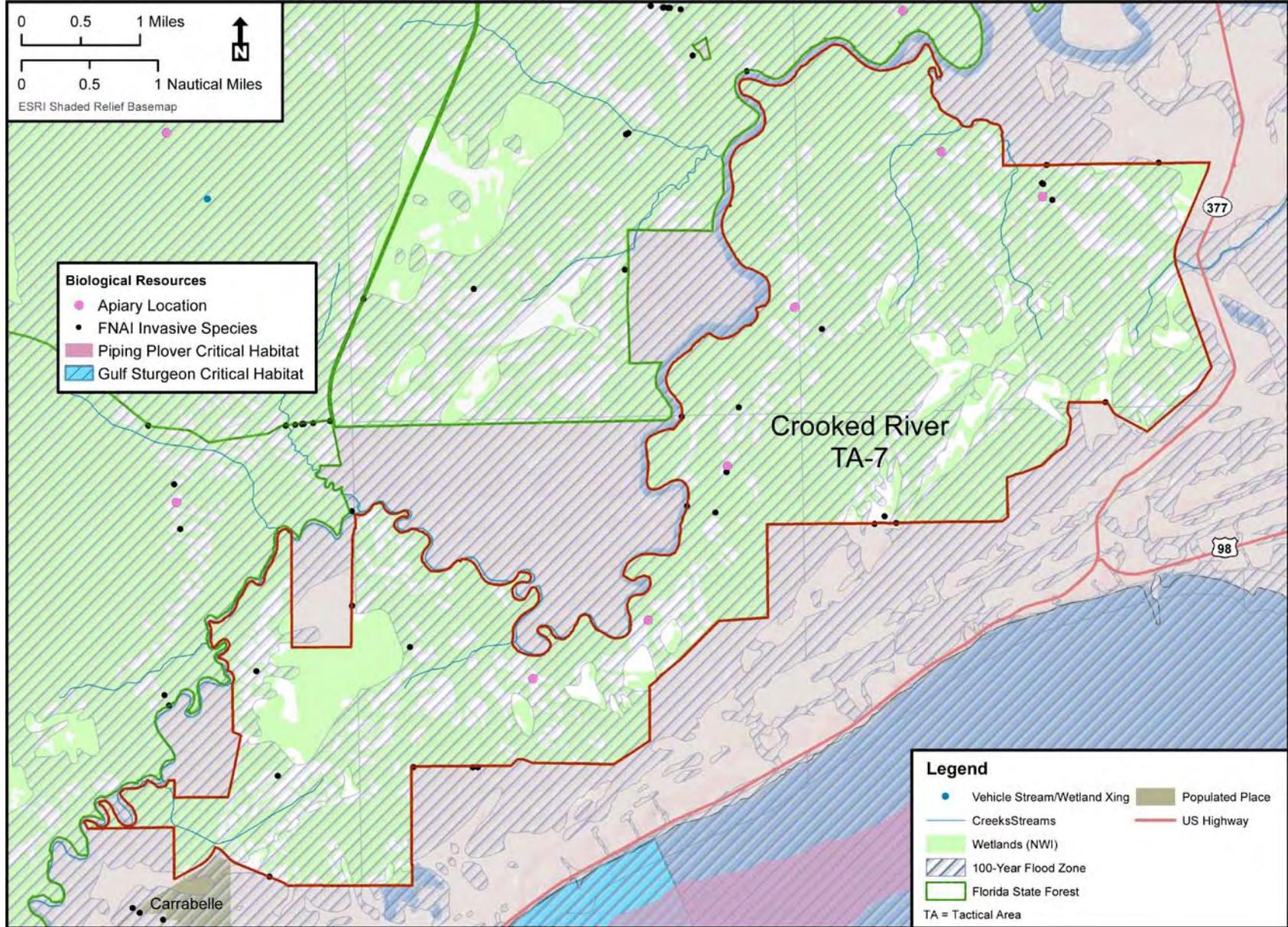


Figure 6-38. Water and Biological Resources – TA-8 at THSF (Return to [Figure 6-38](#))

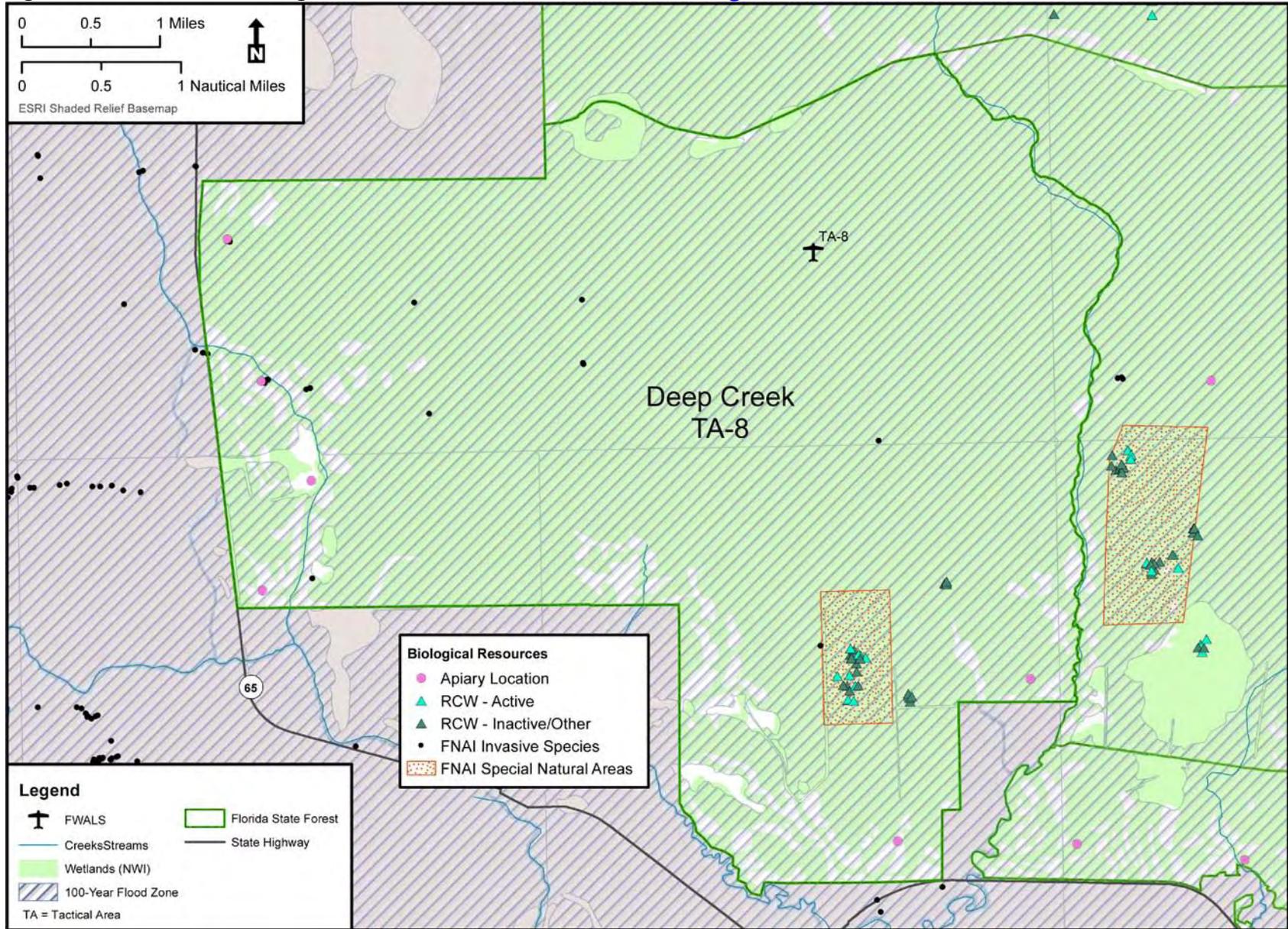


Figure 6-39. Water and Biological Resources – TA-9 at THSF (Return to [Figure 6-39](#))

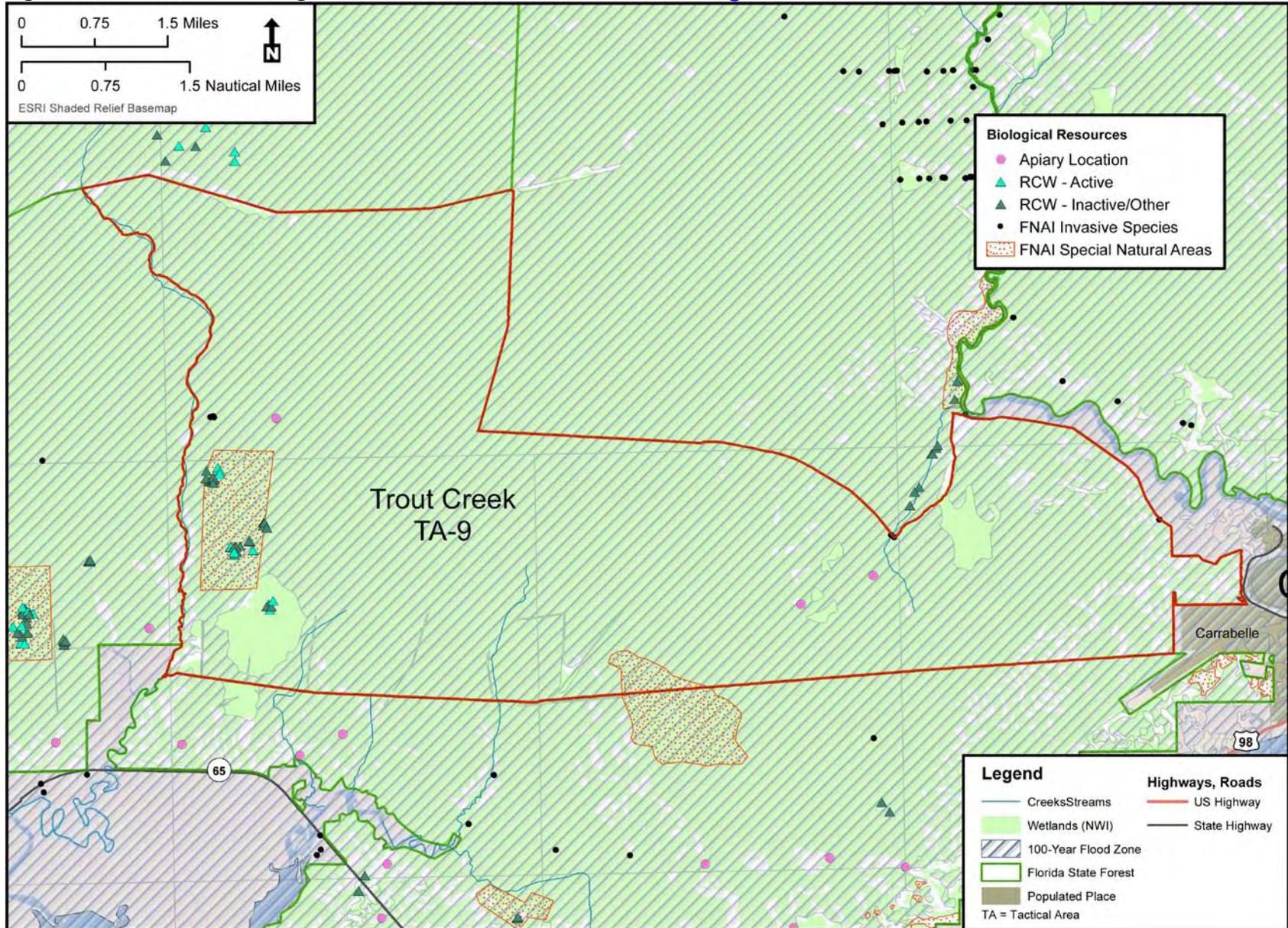


Figure 6-40. Water and Biological Resources – TA-10 at THSF (Return to [Figure 6-40](#))

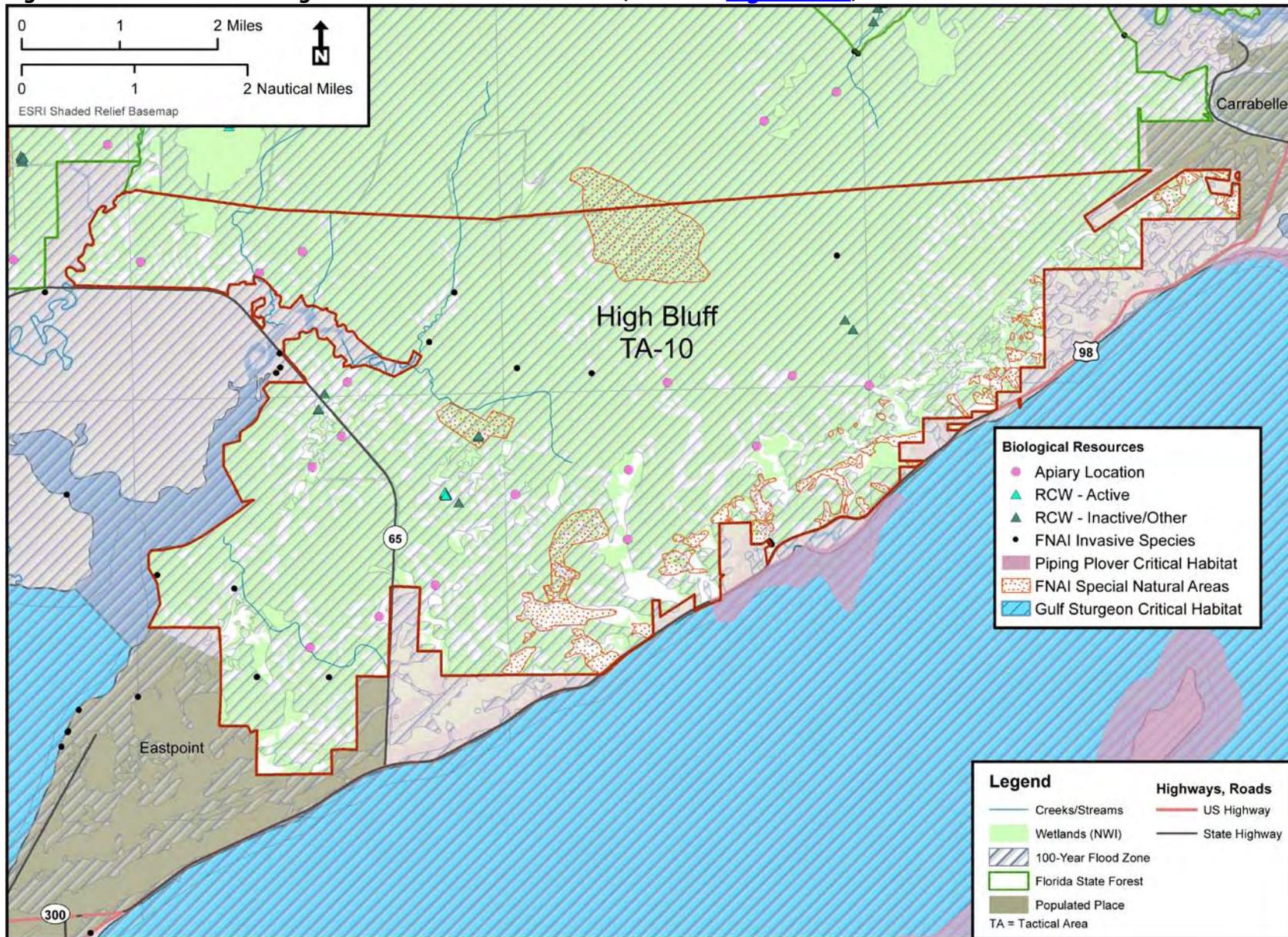


Figure 6-41. Cultural Resource Survey in THSF (Return to [Figure 6-41](#))

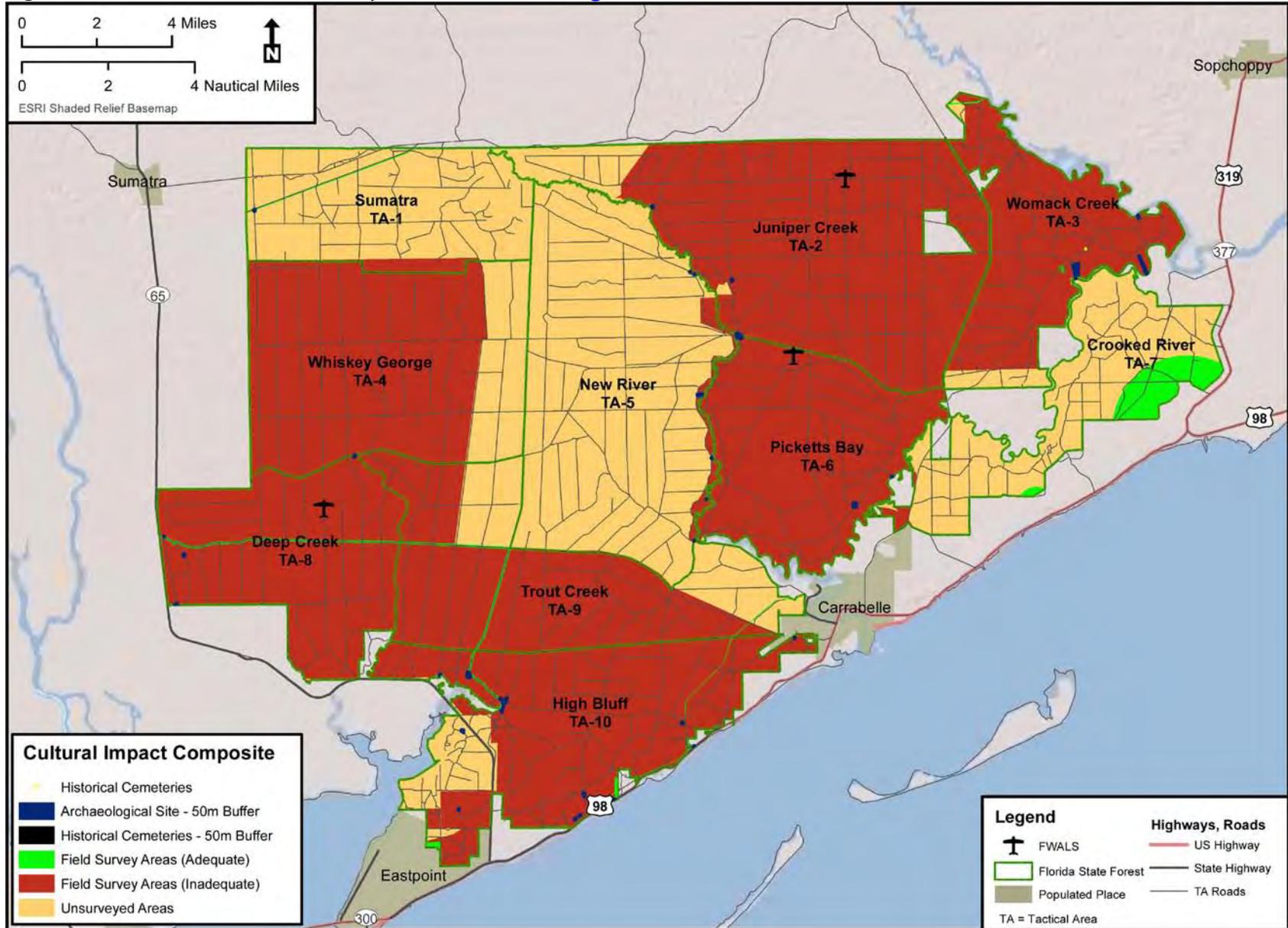


Figure 6-42. Generalized Land Use Types at THSF (Return to [Figure 6-42](#))

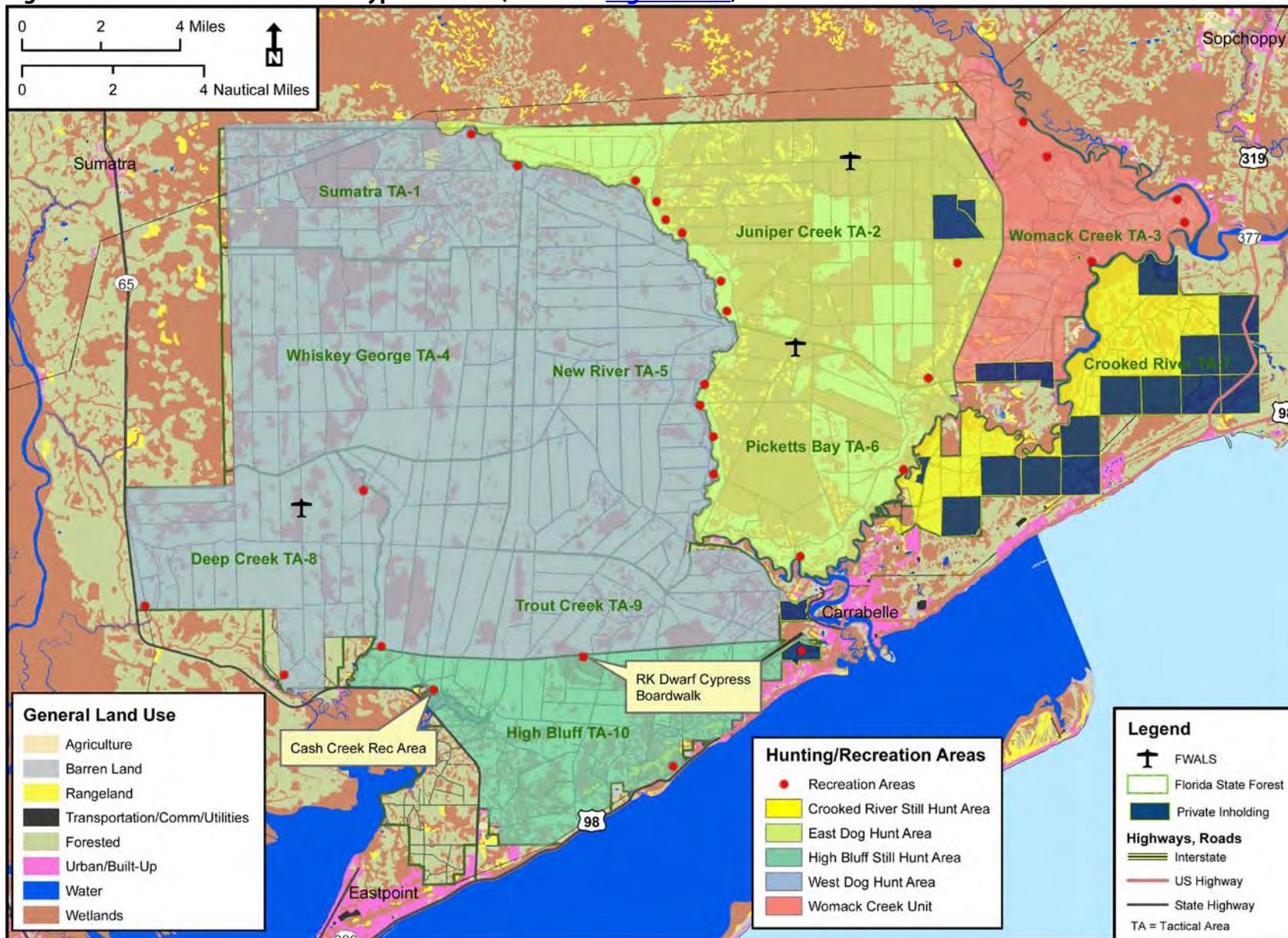


Figure 6-43. Environmental Justice Areas of Concern Near THSF (Return to [Figure 6-43](#))

