DRAFT

ENVIRONMENTAL ASSESSMENT
FOR
EGLIN A AND B RANGES
(TEST AREAS A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, AND B-82)
AT
EGLIN AIR FORCE BASE, FLORIDA

E SEMPRE L'ORA

JULY 2025

RCS 21-257

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ACRONYMS, SYMBOLS, AND ABBREVIATIONS

§/§§	Section/Sections
96 CEG	96th Civil Engineer Group
96 TW	96th Test Wing
AAC	Air Armament Center
AACI	Air Armament Center Instruction
ACAM	Air Conformity Applicability Model
ACM	asbestos-containing material
AF Form	Air Force Form
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFPD	Air Force Policy Directive
AFSOC	Air Force Special Operations Command
AGL	above ground level
APE	Area of Potential Effects
ASUS	American States Utility Services, Inc.
BASH	Bird/Wildlife Aircraft Strike Hazard
BCC	Birds of Conservation Concern
BMP	best management practice
C&D	construction and demolition
CDNL	C-weighted day-night average sound level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRM	Cultural Resources Management
CZMA	Coastal Zone Management Act
DAF	Department of the Air Force
DAFI	Department of the Air Force Instruction
DAFMAN	Department of the Air Force Manual
dB	decibel(s)
dBA	A-weighted decibels
dBP	decibels at peak pressure
dBW	decibels weighted
DLA	Defense Logistics Agency
DNL	day-night average sound level
DoD	Department of Defense
DZ	drop zone
EA	Environmental Assessment
EAFBMAN	Eglin Air Force Base Manual
EBD	Environmental Baseline Document
EIAP	Environmental Impact Analysis Process

EMR	electromagnetic radiation
EMR EA	Electromagnetic Radiation Environmental Assessment
EOD	explosive ordnance disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
ETTC	Eglin Test and Training Complex
FAC	Florida Administrative Code
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
FY	Fiscal Year
GHG	greenhouse gas
GWP	global warming potential
H-E	high-explosive
HFC	hydrofluorocarbon
HLZ	helicopter landing zone
HQNC	High Quality Natural Community
Hz	Hertz
ICRMP	Integrated Cultural Resource Management Plan
INRMP	Integrated Natural Resources Management Plan
IR	infrared radiation
IRP	Installation Restoration Program
LBP	lead-based paint
L_{dnmr}	onset-rate adjusted monthly day-night average sound level
LDP	Legacy Debris Pit
L_{max}	maximum noise level
LUC	land use control
MBTA	Migratory Bird Treaty Act
MFD	maximum fragment distance
MLTTAP	Maintenance of Land Test and Training Areas Program
mm	millimeter
MMW	millimeter wave
MRTFB	Major Range and Test Facility Base
mW/cm^2	milliwatts per square centimeter
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
No.	Number
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
ONA	Outstanding Natural Area
PA	Programmatic Agreement
PBG	potential breeding group
PCB	polychlorinated biphenyl
PFC	perfluorocarbon
PM	particulate matter
PM_{10}	particulate matter with a diameter of 10 microns or less

$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PSD	Prevention of Significant Deterioration
PWS	public water system
QD	Quantity Distance
RCRA	Resource Conservation and Recovery Act
RCW	red-cockaded woodpecker
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
REA	Range Environmental Assessment
RF	radiofrequency
ROI	region of influence
RSL	regional screening level
SAR	small arms range
SDWA	Safe Drinking Water Act
SDZ	surface danger zone
SF_6	sulfur hexafluoride
SOF	Special Operations Forces
SPCC	Spill Prevention, Control, and Countermeasure
SR	State Route
SSL	soil screening level
T&E	Test and Evaluation
TA	Test Area
TBA	to be announced
TBD	to be determined
TCP	traditional cultural place
TNT	2,4,6-trinitrotoluene
tpy	tons per year
TRI	Toxic Release Inventory
TS	Test Site
TT	Test Target
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	unexploded ordnance

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1. PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The Eglin Test and Training Complex (ETTC), located in the Florida Panhandle, is one of 23 component activities that make up the Department of Defense (DoD) Major Range and Test Facility Base (MRTFB). DoD Directive 3200.11 defines the MRTFB as the designated core set of DoD Test and Evaluation (T&E) infrastructure and associated workforce that must be preserved as a national asset to provide T&E capabilities to support the DoD acquisition system. An MRTFB activity is defined as an organizational command element of a DoD component responsible for managing MRTFB capabilities and resources. Eglin Air Force Base (AFB) is primarily situated among three counties: Santa Rosa County, Okaloosa County, and Walton County (Figure 1-1). In addition, Cape San Blas, part of a peninsula in Gulf County, is part of Eglin AFB. The location of the Proposed Action spans multiple test ranges on the ETTC (Figure 1-2).

Eglin AFB's primary function is to support research, development, test, and evaluation of conventional weapons and electronic systems. As Eglin's host wing, the 96th Test Wing (96 TW) provides essential base operating support and services for 9 wings and wing equivalents, 11 operating locations and detachments, and more than 35 associated units from the Department of the Air Force (DAF), the Army, United States (US) Navy, and the US Marine Corps (96th Test Wing, 2022). Eglin AFB also provides support for individual and joint training of operational units and hosts major single service and joint exercises. The ETTC consists of four components, not including the cantonment or main base areas: (1) test areas/test sites, (2) interstitial areas (areas beyond and between the test areas/test sites), (3) Eglin Gulf Test and Training Range, and (4) airspace (over land and water). The 96 TW Commander is the Range Operating Authority for the ETTC.

The 96 TW's unit authorizes, schedules, manages, and monitors activities conducted on the ETTC. The 96 TW is the T&E Center for the DAF's air-delivered weapons, navigation and guidance systems, command and control systems, and Air Force Special Operations Command (AFSOC) systems. The 96 TW provides complete system life cycle development testing and evaluation for a variety of customers including Air Force Systems Program Offices, the Air Force Research Laboratory, logistics and product centers, major commands, other DoD services and US government agencies (e.g., Department of Transportation, National Aeronautics and Space Administration), foreign military sales, and private industry.

1.2 PURPOSE OF THE ACTION

The purpose the Proposed Action described in this Environmental Assessment (EA) focuses on three priority mission requirements: (1) continue mission access and scheduling, (2) ensure environmental compliance, and (3) conduct National Environmental Policy Act (NEPA)-required analysis. The DAF has conducted comprehensive NEPA analysis for testing and training missions for many of the subject test areas and test sites but not for others, particularly those with changing requirements or emerging usage.

1 **Figure 1-1. Location of Eglin Test and Training Complex**

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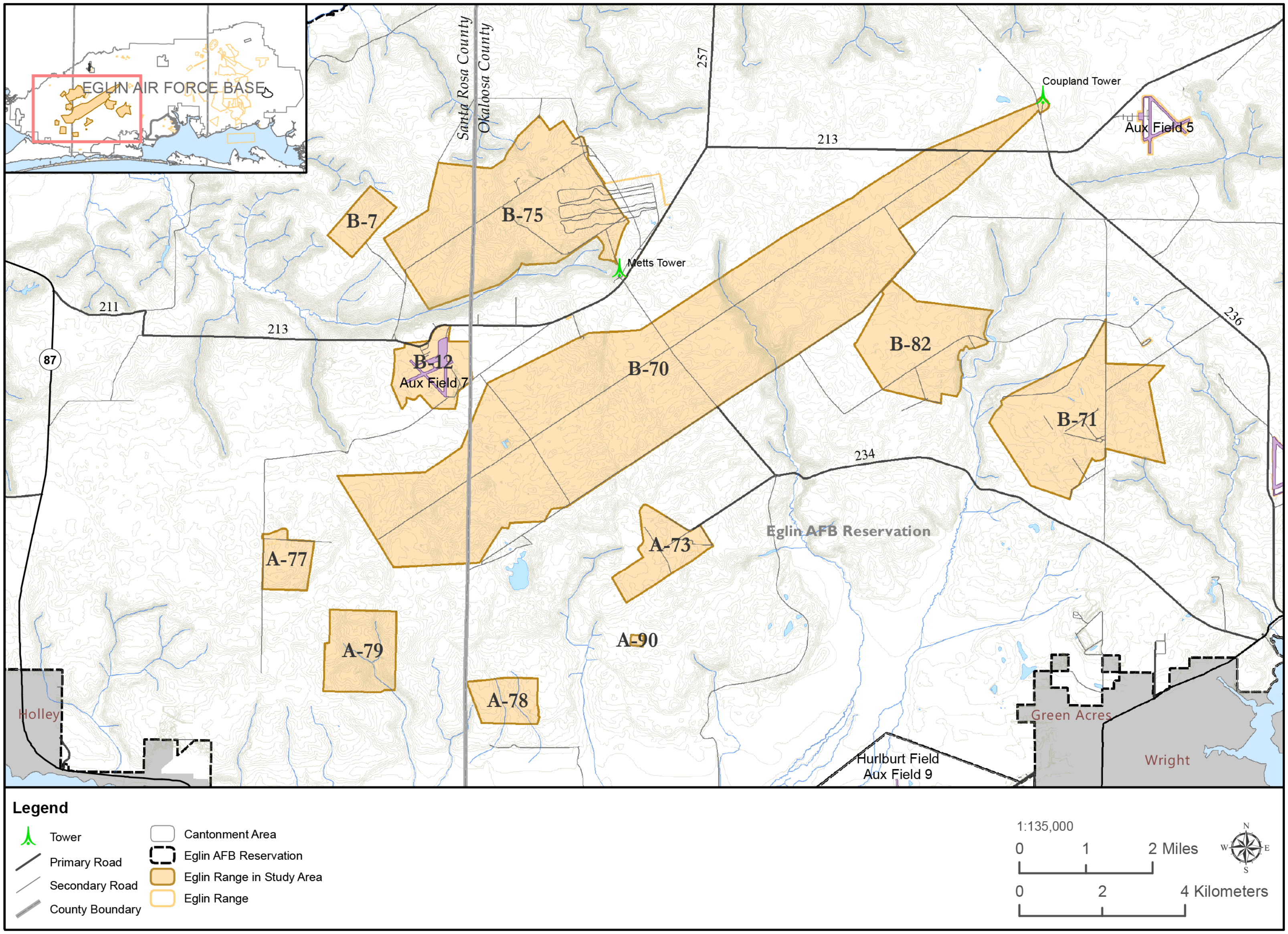

2 **Figure 1-2. Eglin Range Study Area**

1.3 NEED FOR THE ACTION

Environmental analysis is needed to account for potential mission- and environment-related changes to test areas/test sites, conditions, and missions that have occurred since completion of prior Range EAs (REAs). Analysis of an authorized level of activity streamlines priority mission processes and ensures that environmental impacts and compliance with environmental regulations are fully considered.

The history of NEPA compliance for some of the test areas/test sites addressed in this EA dates back to the 1990s, and most of the test area/test site REAs have been updated within the last 10 to 15 years (Table 1-1). In keeping with their intended purpose, and following their completion, the REAs supported and continue to support numerous categorical exclusions (i.e., no EA required) for individual actions.

Table 1-1. Eglin A and B Ranges NEPA Compliance History

Location	Title	Date of Most Recent REA or Update
TA A-73	Air and Ground Gunnery: TAs A-73, A-77, A-78, A-79, B-7, and B-75 Final REA	June 2013
TA A-77		
TA A-78		
TA A-79		
TA A-90	Final Environmental Assessment Construction and Operation of a New Small Arms Range Eglin Air Force Base, Florida	September 2019
TA B-7	Air and Ground Gunnery: TAs A-73, A-77, A-78, A-79, B-7, and B-75 Final REA	June 2013
TA B-12	TA B-12, Final Environmental Baseline Document, Revision 1	April 2006
TA B-70	TA B-70, Final REA, Revision 1	June 2009
TA B-71	TAs B-71 and B-82, Final REA, Revision 1	October 2010
TA B-75	Air and Ground Gunnery: TAs A-73, A-77, A-78, A-79, B-7, and B-75 Final REA	June 2013
TA B-82	TAs B-71 and B-82, Final REA, Revision 1	October 2010

NEPA = National Environmental Policy Act; REA = Range Environmental Assessment; TA = Test Area

1.4 INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

1.4.1 Biological Resources

Per the requirements of Section 7 of the Endangered Species Act (ESA) and implementing regulations (50 Code of Federal Regulations [CFR] Part 402), findings of effect and requests for concurrence were submitted to the US Fish and Wildlife Service (USFWS). Consultation with the USFWS was completed on TBA.

1.4.2 Cultural Resources

In March 2024, Eglin AFB published a memorandum for record from the Eglin AFB Installation Tribal Liaison Officer regarding the history of consultation with six tribes, current initiatives, and the government-to-government tribal consultation with regard to traditional cultural places

(TCPs) and sacred sites at the base. In 2021, Eglin AFB completed a comprehensive Section 106 Programmatic Agreement (PA) with the State Historic Preservation Officer and the Advisory Council on Historic Preservation, in coordination with the tribal groups. Eglin AFB and the tribes recognize that previously unknown TCPs could be identified in the future as more information becomes available. However, each tribe has stated that they are unaware of any TCPs or sacred sites currently located on Eglin AFB lands and prefer not to be consulted regarding each specific project whose impacts have been previously assessed and/or proposed for construction in areas already surveyed and determined to be low risk for TCPs or sacred sites.

1.4.3 Coastal Zone Management Act

Copies of the Draft Final EA and a Coastal Zone Management Act (CZMA) determination were provided to the Florida State Clearinghouse for review, comment, and concurrence. The State of Florida cited no objections to the project (Appendix E, Federal Agency Coastal Zone Management Act Consistency Determination). All substantive agency comments received during consultations and agency review periods for the Draft Final EA have been incorporated into the Final EA.

1.5 PUBLIC PARTICIPATION

A Notice of Availability for public review of the Draft EA was published in the *Northwest Florida Daily News*, and the Draft EA was made available for public review online at https://www.eglin.af.mil/About-Us/EglinDocuments/ from July 8, 2025, until August 8, 2025. Local libraries have internet access and librarians to assist in accessing online documents. The public comment period closed on August 9, 2025, and [TBD] comments were received.

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2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 PROPOSED ACTION ALTERNATIVE

This chapter describes how the DAF would implement the Proposed Action, which is to continue mission access and scheduling, ensure environmental compliance, and conduct NEPA-required analysis. In this EA, two options for meeting the purpose and need for the Proposed Action are presented: the No Action Alternative and Alternative 1. The No Action Alternative is a continuation of current activity levels at test areas/test sites previously analyzed under NEPA. Alternative 1 consists of all activities included in the No Action Alternative, two new radar systems at Test Area (TA) A-73, and future construction, demolition, improvement, and maintenance activities that may occur at all test areas/test sites evaluated in this EA.

2.2 NO ACTION ALTERNATIVE

2.2.1 Testing and Training Description

Testing and training descriptions for TAs A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82 are provided below.

2.2.1.1 TA A-73

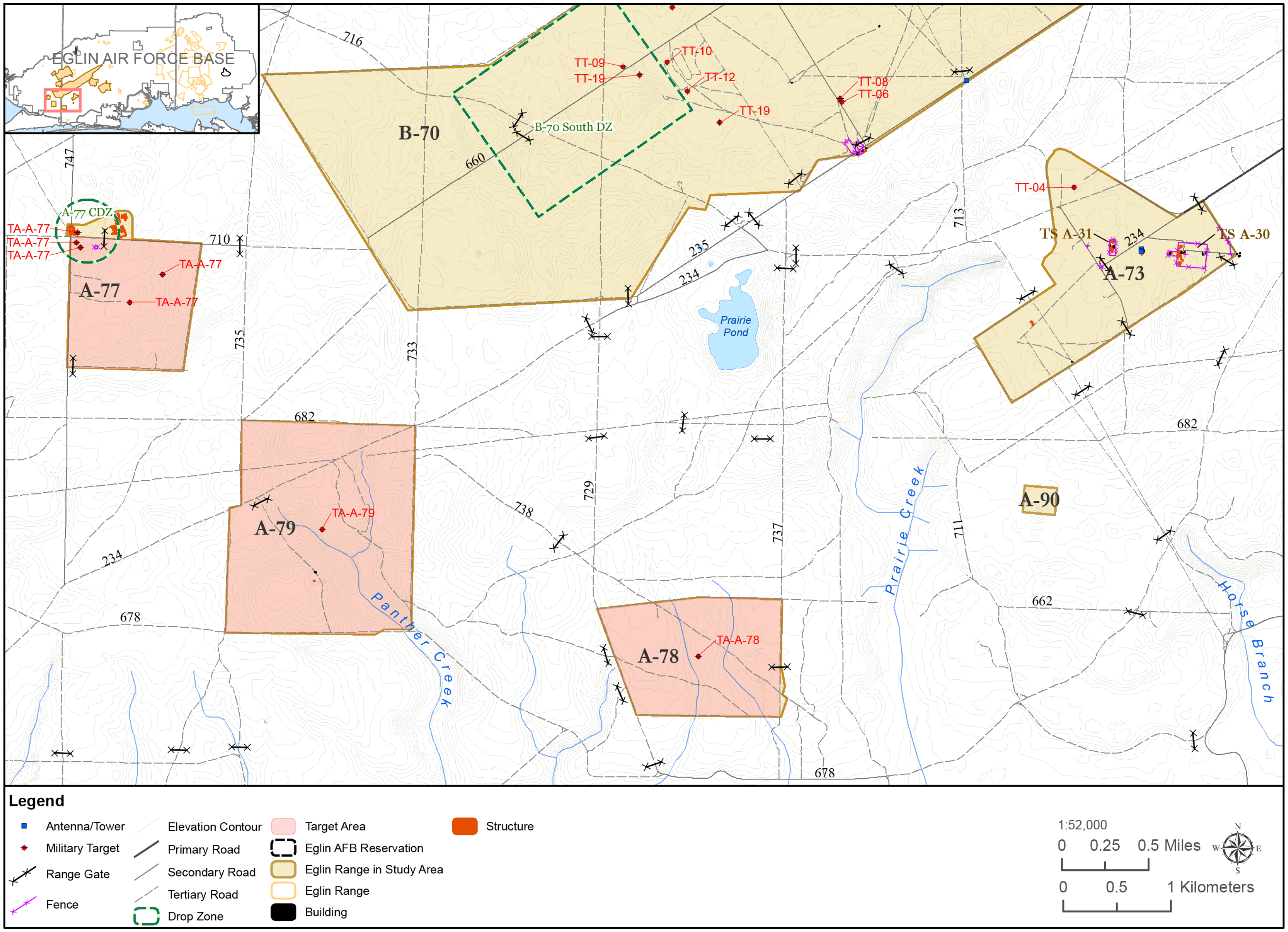
TA A-73 is a test site located approximately 12 miles west of Eglin Main Base (Figure 2-1). Ground training is limited to the westernmost portion of the area on a non-interference basis with radar operations.

The nearly 611-acre area is used for test support systems for ground and flight tests at Test Site (TS) A-30 and TS A-31. TS A-30 and TS A-31 are improved, fenced compounds with permanent concrete pads for locating multiple radar systems, gravel parking areas, and several instrumentation and workbench trailers. There is a security guard station and several towers and facilities located on the test area (Eglin AFB Manual [EAFBMAN] 13-212).

2.2.1.2 TA A-77

TA A-77 is an active target area primarily used as an air-to-ground and surface-to-surface tactical training area for AFSOC personnel and shown in Figure 2-1.

There are two simulated villages to train in combat techniques. The Special Operations Forces (SOF) uses the test area for surface tactical maneuver, direct action, combat medical, intelligence, surveillance, reconnaissance, counter-improvised explosive device, and weapons live-fire training including use of small arms, mortars, and rockets. Other infrastructure on TA A-77 includes a paved helicopter landing zone (HLZ), a drop zone (DZ), limited to only Simulated Airdrop Training Bundles, and a network of roads (EAFBMAN 13-212).



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2 **Figure 2-1. TAs A-73, A-77, A-78, A-79, and A-90**

2.2.1.3 TA A-78

TA A-78 is an active training range primarily used for AFSOC personnel for tactical air-to-ground training in gunnery, bombing, and rocket delivery as well as for ground forces training. The 408-acre cleared area is located approximately 6 miles northwest of Hurlburt Field (Figure 2-1). The test area includes an unscored (i.e., where performance is not measured or evaluated as part of a formal assessment) tactical air-to ground and surface-to-surface live-fire target area and a separate non-lethal ammunition training area (i.e., a training area designed to simulate realistic scenarios using non-lethal ammunition to reduce the chance of serious injuries). The live-fire dedicated impact is approximately 0.6 square miles. AFSOC has constructed simulated village training facility in the southeast portion of the test range which is used by SOF for a variety of activities including surface tactical maneuvers, direct action, combat medical, intelligence, surveillance, reconnaissance, counter-improvised explosive device, Call for Fire, and weapons live-fire training (i.e., small arms, mortars, and rockets). Other infrastructure includes an HLZ, earthen berm small arms firing line with a 25-foot by 135-foot level top surface, and wooded dismounted maneuver area (EAFBMAN 13-212).

2.2.1.4 TA A-79

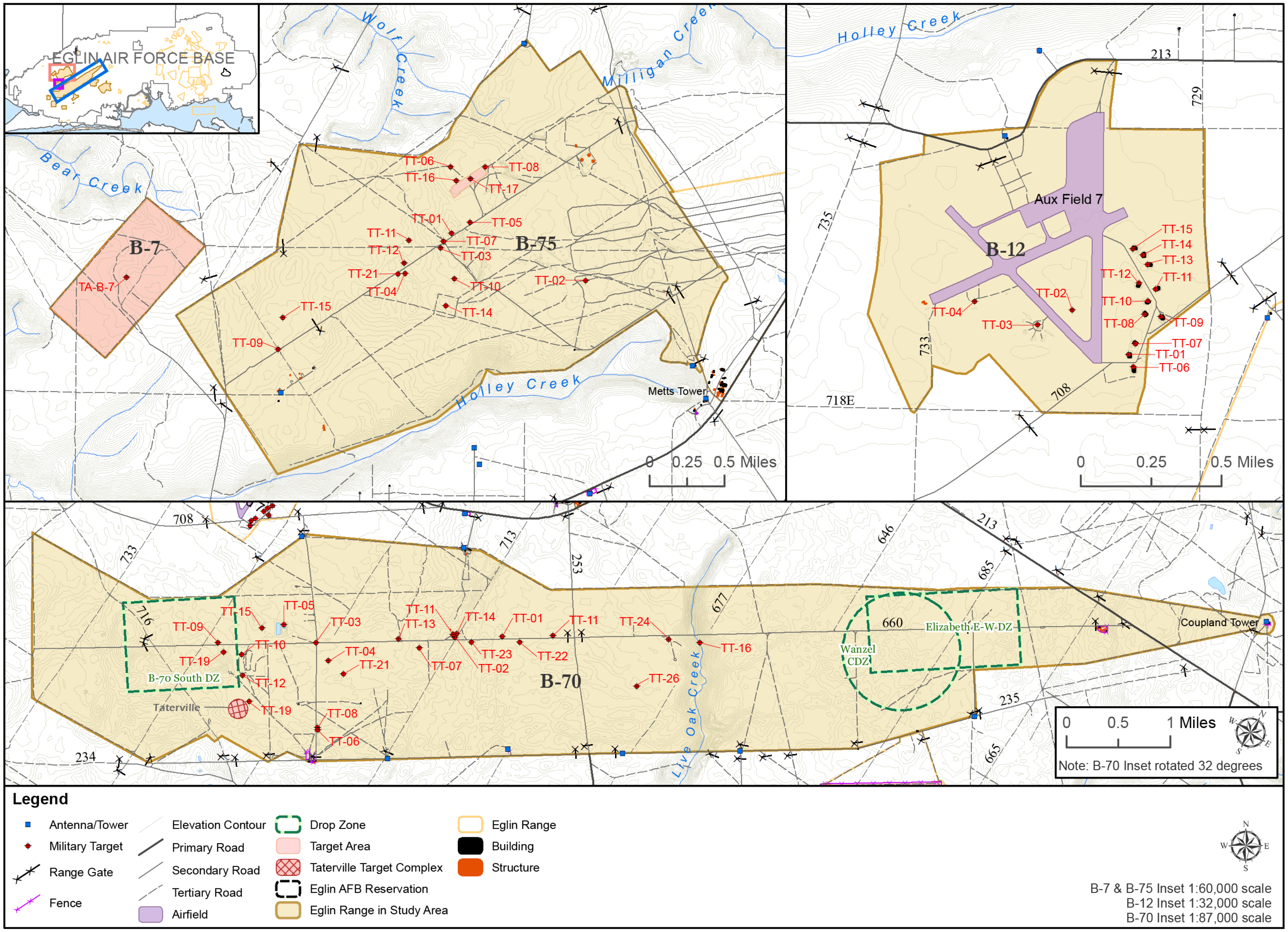
TA A-79 is an inactive test area closed to all mission activity. The area was once designated as an impact area for side-firing weapon systems but is now a clay/sand borrow pit (EAFBMAN 13-212). It was also previously used as an air-to-water target area when the pond, located on the TA, was filled. The test area is located 7 miles northwest of Hurlburt Field (Figure 2-1). Only mission-essential personnel are allowed within the TA A-79 range due to the potential for unexploded ordnance (UXO).

2.2.1.5 TA A-90

TA A-90 is a maneuver-fire small arms range (SAR) located approximately 4.5 miles northwest of Hurlburt Field (Figure 2-1). The test area measures approximately 28 acres consisting of level, cleared, and lightly vegetated ground. There is a cleared administrative area measuring 100 meters long by 250 meters wide located to the rear east of the maneuver area. The east end of the administrative area contains a portable environmental protection shelter, three shade structures, one compacted aggregate vehicle parking area, two entry-control point range gates, and safety signs. At the west end of the maneuver area is a 10-meter by 250-meter earthen backstop berm. There is no electrical, instrumentation, communications, or targets on the range. Range users must provide communication devices to maintain radio and cellular telephone contact with the Joint Test and Training Operations Control Center (JTTOCC). Users of the range must also provide appropriate small arms targets (EAFBMAN 13-212).

2.2.1.6 TA B-7

TA B-7 is an active test range characterized as a sparsely wooded area approximately 1 mile long by 0.5-mile wide and used for side-firing weapon systems tactical air-to-ground training primarily by AC-130s. The test area is adjacent to the northwest corner of TA B-75 and is located approximately 18 miles northwest of Eglin Main Base (Figure 2-2). The test area has no infrastructure; however, various targets are located on the range and subject to frequent relocation.



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2 **Figure 2-2. TAs B-7, B-12, B-70, and B-75**

There is a dedicated impact area located on the range where dud-producing munitions are authorized. Range Safety determines the size of munitions that can be expended on TA B-7 on a case-by-case basis. A 5,000-foot hazard area surrounds the perimeter of the dedicated impact area. Only mission-essential personnel are allowed in the hazard area (EAFBMAN 13-212).

2.2.1.7 TA B-12

TA B-12, also known as Field 7 or Epler Field, is an active test range primarily used for precision-guided munitions engagements, static testing of munitions, ground forces tactical training, aircraft assault landings, unmanned aerial system operations, and simulated chemical/biological agent testing. The size of munitions that may be expended on the range are set by Range Safety on a case-by-case basis. The test area is located approximately 15 miles northwest of Eglin Main Base (Figure 2-2).

TA B-12 used to be an auxiliary field. Most of the original infrastructure no longer remains on the test area with the exception of the runways. There are three runways located on the test area including one open runway and two closed runways. Infrastructure located on TA B-12 includes aircraft shelters, two reinforced concrete shelters, five simulated shelters, and a water tower (EAFBMAN 13-212).

2.2.1.8 TA B-70

TA B-70 is an active test range used to support air-to-ground, ground-to-air, air-to-air, and various ground tests. The test range is approximately 13 miles long and averages 1.25 miles wide, making it the second largest test area on the Eglin Range Complex. The test area provides more than 16 square miles of continuous land. TA B-70 is located approximately 15 miles northwest of Eglin Main Base (Figure 2-2).

TA B-70 is best known as the only overland supersonic range in the United States east of the Mississippi River. TA B-70 supports a variety of testing and training activities that include air-to-surface bombing and missiles; surface-to-surface cruise missiles; ground training and paratroops; shallow-water pond detonations; electronic countermeasures including release of chaff and flares; air-to-surface weapons testing during supersonic flight; and drone take-offs and landings. Items ranging from small submunitions up to 5,000-pound bomb can be tested on TA B-70.

Various test infrastructure, instrumentation, and target areas are located throughout the range and include one control tower, one shallow-water mine pond, a tower structure for elevating targets for Man-Portable Air Defense Systems missions, and multiple target areas and targets. There are also several radar systems located on TS B-10 on the northeast corner of TA B-70 (EAFBMAN 13-212).

2.2.1.9 TA B-71

TA B-71 is an active multipurpose ground test range used to support static ground tests such as arena testing (i.e., a test designed to assess the explosive effects of a munition in a controlled environment) and fast cook-offs (i.e., test simulating a munition’s reaction to a fire to assess its safety and stability). The test area is located approximately 8 miles west of Eglin Main Base (Figure 2-3). The dominant feature of the test area is Test Target (TT)-1, a gridded asphalt area used to test submunitions or bomblets. A railroad track, approximately 1.5 miles long, is located near the southeast border of the test area. Infrastructure available on TA B-71 supports the different types of testing activities performed within the test area (EAFBMAN 13-212).

2.2.1.10 TA B-75

TA B-75 is an active multipurpose range that regularly supports both testing and training activities. The area is a cleared, roughly rectangular 3,593-acre tract with more than 5 square miles of continuous test area lands located approximately 15 miles from Eglin Main Base (Figure 2-2). TA B-75 is capable of supporting air-to-ground, ground-to-air, air-to-air, as well as ground-to-ground tests and training missions. Air-to-ground tests include bombing, rocketry, runway penetration, and missiles.

Targeting systems may be stationary or remote-controlled vehicles. Ground-to-air and air-to-air tests include missiles against stationary and remotely piloted vehicles. Ground-to-ground tests include guns and missiles targeting stationary and remote-controlled moving targets. The majority of munitions expended on the range are inert or training rounds and range from small arms to 500-pound bombs.

TA B-75 is configured with various concrete, asphalt, and clay pads for static ground-to-ground firing and detonations. A tank gun range and small arms target complex is operated and maintained by the Alabama Army National Guard for annual training. It consists of a number of fixed and moving pop-up targets for gunnery training (EAFBMAN 13-212).

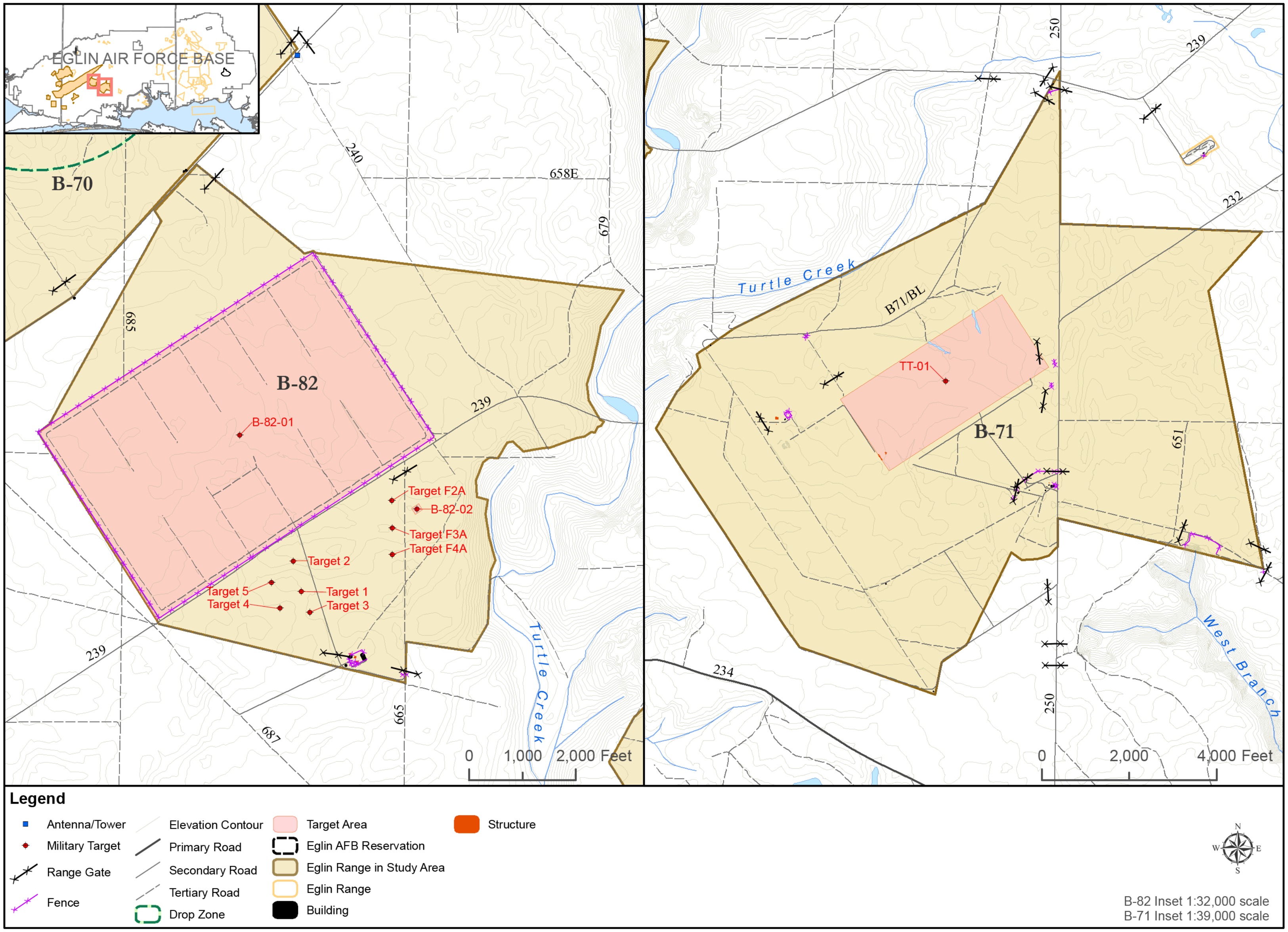
2.2.1.11 TA B-82

TA B-82 is an active general-purpose air-to-ground test range used to support test activities. Test activities include aerial delivery of conventional munitions and submunitions for patterns from dispensers, function rates, and terminal angle and terminal velocity. Other uses include static tests of munitions, long delay function characteristics, for ground-based air gun launching of submunitions to simulate the terminal portion of the flightpath and to collect impact and function data. The test range is located approximately 9 miles west of Eglin Main Base and is about 0.5 miles northwest of TA B-71 (Figure 2-3). Range Road 239 runs across the test area in a northeast-southwest direction and Range Road 665 runs across the test area in a north-south direction.

The dominant features of this test area consist of a fenced target area with a clay center DZ, which can be used for testing, testing with long function time, or testing which requires limited access. The area is considered a hazardous area; therefore, personnel are not authorized to enter the dedicated impact area without an explosive ordnance disposal (EOD) escort. Air-to-ground testing on large multi-level flight targets with long lead construction times are conducted in the area south of the fenced test area. Coordination with Range Safety is mandatory for each munition and dispenser systems (EAFBMAN 13-212).

2.2.1.12 Summary Table of Test Areas Analyzed

Table 2-1 summarizes the instrumentation, targets, and land cover to test areas analyzed in this EA.



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2 **Figure 2-3. TAs B-71 and B-82**

Table 2-1. Summary of Test Areas Analyzed in this Environmental Assessment

Test Area	Description	Targets
A-73 (TSs A-30 and A-31)	***Primary Usage:*** Test Site ***Status:*** Active ***Targets:*** TT-04 ***Land Cover:*** 610.4-acre clearing almost completely surrounded by the Patterson Outstanding Natural Area/Significant Botanical Site, one of the largest areas of old-growth longleaf pine trees in the southeast. Primary soil type is the Lakeland Sand soil series.	TT-04
A-77	***Primary Usage:*** A/G and S/S Tactical Training Area ***Status:*** Active ***Targets:*** Tactical targets (i.e., armored/unarmored vehicles, tanks, artillery guns, and personnel silhouettes) are distributed throughout the impact areas, both Main and UJCAS. ***Land Cover:*** 370-acre clearing completely surrounded by the TA A-77 Outstanding Natural Area, which includes some of the highest-quality sandhills on Eglin and two high-quality steephead streams. Primary soil type is the Lakeland Sand soil series.	Multiple tactical targets (i.e., armored/unarmored vehicles, tanks, artillery guns, and personnel silhouettes) are distributed throughout the area.
A-78	***Primary Usage:*** A/G and S/S Tactical Training Area ***Status:*** Active ***Targets:*** Tactical targets (i.e., armored/unarmored vehicles, tanks, artillery guns, and personnel silhouettes) are distributed throughout the impact areas and subject to frequent relocation, reconstruction, and refresh. Buildings in the simulated village, HLZ, personnel vehicles and other items outside the dedicated impact areas are not targets. ***Land Cover:*** 408-acre clearing surrounded by dense woods. Primary soil type is the Lakeland Sand soil series.	Tactical targets (i.e., armored/unarmored vehicles, tanks, artillery guns, and personnel silhouettes)
A-79	***Primary Usage:*** Closed to all mission activity. No longer a mission supporting range. Site is now a clay/sand borrow pit. ***Status:*** Closed ***Targets:*** None ***Land Cover:*** TA A-79 is almost completely surrounded by the Prairie Creek Outstanding Natural Area. Primary soil type is the Lakeland Sand soil series.	None
A-90	***Primary Usage:*** Maneuver-Fire Small Arms Range ***Status:*** TBD ***Targets:*** None. Range users must provide appropriate small arms targets. ***Land Cover:*** 28-acre cleared area	None
B-7	***Primary Usage:*** Side-Firing Weapons Tactical Training Range. ***Communications:*** Permission to go hot is obtained from the JTTOCC. If radio contact is lost after firing has commenced aircraft will cease fire and will not resume until communications are reestablished. ***Targets:*** Various targets are located on the range and are subject to frequent relocation. ***Land Cover:*** A 1-mile-long by 0.5-mile-wide sparsely wooded area. Primary soil type is the Lakeland Sand soil series.	Various targets are located on the range and are subject to frequent relocation.
B-12	***Primary Usage:*** Precision-guided munitions engagements, tactical training area, and UAV operations. ***Status:*** Active. ***Targets:*** Multiple bunker/aircraft shelter TTs.	TT-01 TTs Aircraft Shelter Complex, Hangar No. 1 (Epler Field), TT-02, TT-03 SAM Site No. 2, Fixed, Elevation 145.25 feet MSL, Top of Mound (Epler Field),

Table 2-1. Summary of Test Areas Analyzed in this Environmental Assessment

Test Area	Description	Targets
	Land Cover: The terrain at TA B-12 is relatively flat and the soils are sandy. The vegetation is primarily groundcover with small pines and turkey oaks on the surrounding areas. The groundcover, except for the runways, consists of predominantly grasses, eastern bracken fern and gopher apple. No streams flow through the range although Holly Creek flows adjacent to the western border.	TT-04, TT-06, TT-07, TT-08, TT-09, TT-10, TT-11, TT-12, TT-13, TT-14, TT-15
B-70	***Primary Usage:*** Open Air Bomb, Gun, and Rocket TA; Shallow-Water Mine Test Pond. ***Status:*** Active. ***Targets:*** Several target configurations throughout the range and special targets (billboards, vehicles, containers, etc.) can be provided. Target arrays for tests include stationary vehicle arrays, remote-controlled vehicles, bridges, bunkers, simulated buildings, and general-purpose targets. ***Land Cover:*** The Lakeland Sand soil series is the primary soil type for TA B-70. There is one stream on TA B-70, Live Oak Creek, which flows in a north-south direction across the center portion of TA B-70 and one natural and semi-permanent pond, Bull Pond.	TT-01, TT-02, TT-03, TT-04, TT-05, TT-06, TT-07, TT-08, TT-09, TT-10, TT-11, TT-12, TT-13, TT-14, TT-15, TT-16, TT-19, TT-19* (B-70 South DZ), TT-21, TT-22, TT-23, TT-24, TT-26
B-71	***Primary Usage:*** Multipurpose Ground Test. ***Status:*** Active. ***Targets:*** A six degree of freedom motion platform table is located on the west end of the asphalt grid that has been used for simulating ship motion. There are several pans installed on the pad for fast cook-off testing. ***Land Cover:*** There are no natural surface waters (i.e., creeks, streams, or ponds) directly on this TA. The soils of this test area are sandy, well drained, and yellowish-brown in color. The terrain is uneven, varying from 100 to 170 feet above sea level with most of the area at approximately 125 feet elevation. The vegetation on TA B-71 is primarily grasses with mixed shrubs.	TT-01: gridded asphalt area 2,000 feet by 4,500 feet
B-75	***Primary Usage:*** Multipurpose range used for A/G, G/A, A/A, and G/G tests. ***Status:*** Active. ***Targets:*** Targets may be of the stationary type, or remote-controlled moving vehicles. G/A and A/A tests include missiles against remotely piloted vehicles. G/G tests include guns and missiles against stationary and remote-controlled moving targets. A target complex including stationary, moving, and pop-up targets operated and maintained by the Alabama Army National Guard. The test range is configured with various concrete, asphalt, and clay pads for static firings and detonations, including a 300-foot radius clay pad for static arena tests. ***Land Cover:*** Cleared rectangular area 3.5 by 1.5 miles. Primary soil type is the Lakeland Sand soil series.	TT-01: Billboard target, TT-02, TT-03: Rocket target, TT-04, TT-05, TT-06, TT-07: Clay cross, TT-08, TT-09: Clay cross, TT-10, TT-11, TT-12, TT-14, TT-15, TT-16, TT-17: Runway target, TT-21: single-room concrete buildings

Table 2-1. Summary of Test Areas Analyzed in this Environmental Assessment

Test Area	Description	Targets
B-82	***Primary Usage:*** General-purpose A/G test range. ***Status:*** Active. ***Targets:*** Multiple. ***Land Cover:*** Consists of a target area with a clay target area. The clay/sand center DZ was once coated with a spray-on bituminous surface, but the surface is now primarily sand with scattered shrubs. The terrain is reasonably flat with an average elevation of 175 feet. The soils on TA B-82 are of the Lakeland Association series. The vegetation consists of pines, turkey oaks, and live oaks. The groundcover is predominantly grasses, eastern bracken fern, and gopher apple. Turtle Creek is adjacent to the southeastern border of the TA.	Target 1, Target 2, Target 3, Target 4, Target 5, Target B-82-01, Target B-82-02, Target F3A, Target F4A

Source: (DAF, 2006; DAF, 2007a); EAFBMAN 13-212)

A/A = air-to-air; A/G = air-to-ground; DZ = drop zone; EAFBMAN = Eglin Air Force Base Manual; EOD = explosive ordnance disposal; G/A = ground-to-air; G/G = ground-to-ground; HLZ = helicopter landing zone; JTTOCC = Joint Test and Training Operations Control Center; MSL = mean sea level; No. = Number; S/S = surface-to-surface; SAM = System to Air; TA = Test Area; TBD = to be determined; TS = Test Site; TT = Test Target; UAV = unmanned aerial vehicle; UJCAS = Urban Joint Close Air Support

2.2.2 Test Areas/Test Sites Expenditures

Table 2-2 lists expenditures by category and represents the maximum annual amount expended from Fiscal Year (FY) 2018 to FY 2023.

Table 2-2. Maximum Annual Expenditures for TAs A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Test Area	Large Ordnance Example: MK-66 Bomb		Large Cartridge (Gunnery/ Artillery) Example: 105-mm Round		Medium Cartridge Example: 40-mm Round		Small Cartridge (Small Arms) Example: 7.62-mm Round		Explosives/Pyrotechnics/Smokes/Flares (Number of Expenditures or Detonations)					Miscellaneous Explosive Components	
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	A/G	Mines	Grenade	Sims	C-4[1]	Rocket/ Missile	Smoke/ Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator
A-73[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A-77	-	52	101	9,459	3,554	62,962	102,630	97,708	-	9	10	-	110	20	-
A-78	-	12	1	8,462	5,717	59,161	102,699	72,261	-	-	12	-	1,514	28	-
A-79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A-90[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-7	-	1	-	4,649	900	38,279	13,600	13,616	-	-	-	-	1	-	-
B-12	-	-	-	-	-	-	-	115,325	-	58	777	-	-	-	493

Table 2-2. Maximum Annual Expenditures for TAs A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Test Area	Large Ordnance Example: MK-66 Bomb		Large Cartridge (Gunnery/ Artillery) Example: 105-mm Round		Medium Cartridge Example: 40-mm Round		Small Cartridge (Small Arms) Example: 7.62-mm Round		Explosives/Pyrotechnics/Smokes/Flares (Number of Expenditures or Detonations)					Miscellaneous Explosive Components	
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	A/G	Mines	Grenade	Sims	C-4[1]	Rocket/ Missile	Smoke/ Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator
B-70	5	130	55	80	-	96	-	2,961,140	189	-	9,500	12	90	568	3,004
B-71	2	-	23	-	-	-	-	-	-	16	-	27	1	-	609
B-75	-	-	-	70	5,241	154	623,140	19,947	-	2,252	-	4,479	-	12	31
B-82	-	18	-	-	-	-	-	-	-	-	-	320	-	-	1,484

- = no data/not applicable; A/G=air-to-ground; FY = Fiscal Year; Gnd = ground; mm = millimeter; SAR = small arms range; Sims = simulators; TA = Test Area

Notes:

1. Numbers represent the maximum annual number of charges detonated recorded between Calendar Year 2018 and Calendar Year 2023. Explosive materials other than C-4, such as 2,4,6-trinitrotoluene and Composition B, may also be used. The net explosive weight of each detonation may range from less than 1 pound to 40 pounds.
2. The SAR at TA A-73 has been dismantled, which is why there are no recorded expenditures.
3. TA A-90 is not active yet and, therefore, has no recorded expenditure data for FY 2018 to 2023. However, the range has been previously analyzed for up to 500,000 rounds of small arms ammunition in the 2019 *Final Environmental Assessment Construction and Operation of a New Small Arms Range* (USACE, 2019).

2.2.3 Range Clearance and Maintenance

Range clearance and road maintenance activities ensure continued access and use of the ETTC. This section discusses the types of road maintenance actions on test areas/test sites and the general frequency with which the DAF implements these maintenance actions.

Test area/test site maintenance involves a number of different activities, which together maintain the physical infrastructure of the ETTC and ensure range sustainment. Maintenance actions include routine clearance activities (retrieval and disposal) of UXO and range debris, target management, vegetation management, and maintenance of range access/control infrastructure.

2.2.3.1 UXO and Routine Range Clearance

Routine range clearance of designated active test and training areas ensures continued operational range use by removing range residue and UXO associated with past and current operations. Range clearance includes removal or disposal of surface material, including ordnance items, inert ordnance debris, ammunition, and other range debris resulting from testing and training missions. As needed, EOD personnel clear targets prior to and following a mission, and clear test areas/test sites of UXO or other expended items that may contain explosive material. Routine range clearance is conducted in accordance with Air Force Manual (AFMAN) 13-212, *Range Planning and Operations*. EOD personnel and/or UXO qualified contractor personnel ensure targets are safe from explosive hazards prior to moving or processing them for disposal in accordance with established DAF procedures. Range clearance methods are described in the *Comprehensive Range Plan, UXO/Range Debris Component Plan* (DAF, 2019a). Most UXO items are located on the ground surface. However, some items require subsurface recovery or destruction in place. These actions typically occur only when construction activities are planned and result in soil disturbance. Due to UXO concerns, vehicles and personnel rarely leave existing roads and areas that previously have been cleared.

2.2.3.2 Range Debris

Range debris includes non-munitions items such as concrete, lumber, or metals. As these materials may still have been in contact with explosive materials, they are first determined to be safe from explosives before disposal. Responsibilities for the proper management of potentially explosive materials are described in DoD Instruction 4140.62, *Material Potentially Presenting an Explosive Hazard*. Range debris is disposed in accordance with the Defense Logistics Agency (DLA) directives and a Memorandum of Agreement with the DLA, through commercial sales, or through the Qualified Recycling Program (AFMAN 13-212). Debris removal methods are not specified, but it is assumed that a variety of methods could be employed as necessary, including hand removal and use of hand tools or motorized equipment. In some cases, heavy equipment could be required. There would be potential for relatively minor soil disturbance associated with some removal activities.

2.2.3.3 Target Management and Training Asset Maintenance

Target repair, replacement, and construction involve activities such as the placement of shipping containers and sanitized target vehicles and basic construction and welding using concrete blocks, wood, and sheet metal. The quantities of materials used in repairs are determined by range maintenance contracts. Target maintenance may also include painting and welding support for targets. When welding is necessary, a portable electrical generator/welding unit would typically be utilized. Forklifts, loaders, tractors, and other heavy equipment are used during target maintenance. Training assets include areas such as DZs and landing zones. Maintenance of unpaved training assets consists mostly of mowing but can also include some grading.

2.2.3.4 Range Vegetation Control

Vegetation is controlled on test areas/test sites to keep the ranges clear, maintain line-of-sight at applicable locations, and to manage the potential for mission-related wildfire. The method and frequency of control may vary for each test area/test site and can include mowing or bush hogging, herbicide application, tree removal, and prescribed burning. Prescribed burning is managed by the Air Force Civil Engineer Center (AFCEC), Environmental Operations Division (Air Force Wildland Fire Center) and follows a burn plan in coordination with the Range Configuration Control Committee (AFMAN 13-212). Tree removal is conducted as necessary in coordination with the 796th Civil Engineer Squadron/Range Pavement Group and 96th Civil Engineer Group/Environmental Assets (96 CEG/CEIEA) Natural Resources Office (Eglin's Natural Resources Office).

2.2.3.5 Range Roads

The Maintenance of Land Test and Training Areas Program (MLTTAP) classifies Eglin AFB range roads according to usage and maintenance requirements into the categories of primary, secondary, and tertiary. Primary roads are numbered and are essential for range access. They can be either paved or dirt, are used daily, and are maintained to support travel by a standard two-wheel drive passenger vehicle. Dirt primary roads are maintained approximately every 2 to 6 weeks to ensure good travel conditions. Secondary roads, which are maintained every 1 to 6 months, are used less frequently than primary roads and are necessary for range operations but not necessarily range access. Tertiary roads are numbered roads that are not required for range access or operation. These roads, which may require four-wheel drive, are not maintained on a regular schedule. Lastly, there are unofficial range roads that may not appear on maps. Unofficial range roads are used for such things as firebreaks or timber harvesting and are not maintained to any standard or schedule (EAFBMAN 13-212).

Typical maintenance activities on paved roads are patching potholes and replacing damaged sections of asphalt using a dump truck, paver, and roller. Unpaved roads are vulnerable to erosion from vehicles and natural weathering processes. Typical maintenance activities on unpaved roads consist of grading, resurfacing, filling holes, and repairing washouts. Such maintenance work often requires the use of heavy equipment such as motor graders, pavers, rollers, dump trucks, and bulldozers. More intensive and frequent maintenance is usually necessary for sloped areas and stream crossings to keep them usable and to prevent negative environmental impact. Culvert maintenance, repair, and replacement are conducted at stream crossings as necessary.

2.3 ALTERNATIVE 1 (CURRENT PLUS FUTURE)

2.3.1 Testing and Training Description under Alternative 1

In addition to activities described under Section 2.2.1 (Testing and Training Description) under the No Action Alternative, this section describes testing and training under Alternative 1, which would include two new radar systems (TA A-73), and future construction, demolition, improvement, and maintenance activities that may occur at all test areas/tests evaluated in this EA.

2.3.1.1 TA A-73

Two new test sites have been created within TA A-73 for radars. The previous radar at TA A-73 is no longer being used. Because TA A-73 no longer has a SAR, there are no expenditures at TA A-73 (see Table 2-2). The radar is addressed in the Electromagnetic Radiation EA (EMR EA) (DAF, 2017a), and the new sites will be addressed in a future iteration of the EMR EA.

2.3.2 Test Areas/Test Sites and Road Maintenance

Test area and road maintenance under Alternative 1 would be the same as for the No Action Alternative. Maintenance actions would potentially include routine retrieval and disposal of UXO and range debris, clearance activities, target management, vegetation management, and maintenance of range access/control infrastructure.

2.3.3 New Construction

There are no major construction projects planned for the test areas addressed in this EA. It is anticipated that there could be occasional minor construction, either facility, target structure, or land clearing under Alternative 1.

2.3.3.1 Typical Minor Construction

In addition to specific planned actions discussed in this section, Alternative 1 includes typical minor future construction, demolition, renovation, and facility modifications that could potentially occur within the A and B Ranges over the next 7 years. These activities would be located within existing range profiles, and all management actions described in this EA would be followed (refer to the *Management Actions* subsection of each respective resource section). Individual projects would generally be under 2 acres and presumed to include impervious surface additions. These types of actions would be reviewed for environmental concerns through the Environmental Impact Analysis Process (EIAP) using Air Force Form (AF Form) 813 (Request for Environmental Impact Analysis). Under this EA, the total area of disturbance authorized over the 7-year period would not exceed 250 acres, which is approximately 0.05 percent of the Eglin AFB land area.

2.4 ALTERNATIVES ELIMINATED

Historically, REAs have often used a surge scenario as an alternative basis, which means establishing some new major percent increase in the number of test events or expendables. Because no stakeholders indicated a desire to increase capacity of testing or training missions for this EA, this type of alternative was not carried forward.

2.5 PERMITS, LICENSES, AND OTHER AUTHORIZATIONS

To minimize impacts, the following permits, licenses, and other authorizations would be required:

- A CZMA Consistency Determination (Appendix E, Federal Agency Coastal Zone Management Act Consistency Determination) would be required.
- Activities would comply with Clean Water Act Section 404 (*Permits for Dredged or Fill Material*), Florida Administrative Code (FAC) Chapter 62-302 (*Surface Water Quality Standards*), and FAC Chapter 62-312 (*Dredge and Fill Activities*), and all required permits would be obtained. Activities would be conducted in accordance with any permit requirements (e.g., Environmental Resource Permit, Erosion and Sediment Control Plan requirements, National Pollutant Discharge Elimination System (NPDES) permit, stormwater pollution prevention plan).
- All actions with the potential to impact floodplains or wetlands would undergo evaluation on a case-by-case basis through the EIAP (AF Form 813 [*Request for Environmental Impact Analysis*] process) to obtain a Finding of No Practicable Alternative.
- Land-clearance, construction, or renovation activities on structures would require adherence to current regulations, including an NPDES permit to any proposed ground disturbance over 1 acre.
- A Section 10 permit may be required for construction over, under, or in a water of the United States.

2.6 COMPARISON OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Table 2-3 summarizes potential impacts to resources of the affected environment.

Table 2-3. Summary of Impacts by Alternative

Resource	No Action Alternative	Alternative 1
Air Quality	Air emissions would remain consistent with existing baseline conditions from ongoing munitions use and minor construction/maintenance activities. Emissions associated with munitions, ordnance, other detonations, and maintenance activities would be only a very small fraction (less than 1%) of those in the region of influence under existing conditions. Similarly, the amount of pollutants and greenhouse gases emitted would be less than 1% of those in the region of influence. There would be no significant impacts related to air quality under the No Action Alternative.	Air emissions would increase slightly due to the actions proposed under Alternative 1. Potential impacts on air quality would be similar to those of the No Action Alternative. Emissions would be less than 1% of those of the region of influence under existing conditions. Although these actions would result in a slight increase in emissions, the levels are not expected to approach or exceed applicable air quality standards, and no significant air quality impacts are anticipated.
Biological Resources	Biological resources, including protected species, could potentially be affected by direct strikes, habitat alteration, noise and other disturbance, and the introduction or spread of invasive species. Target locations generally consist of cleared areas or areas of maintained vegetation, and the potential for direct strike of wildlife or sensitive habitats by ammunition, ordnance, and electromagnetic radiation (radar) is small. Vehicles and other equipment are unlikely to strike wildlife and would generally not be operated in sensitive habitats. Mission-generated wildfires would impact a small number of animals relative to population numbers and could result in potentially adverse or beneficial habitat impacts. Munitions, C-4 explosives, pyrotechnics, and other explosive components are generally used in areas of exposed soil or maintained vegetation, which provide little habitat value for most species. Substantial effects related to erosion would not be expected. Deposition of metals, explosives, explosives by-products, and chemical and biological simulants would probably have little overall potential to degrade soil and water quality to a level that would adversely impact organisms, with the exception of heavily used target areas. Such areas likely support comparatively low wildlife occurrence. Wildlife would likely hear and potentially react to impulsive sounds produced during testing and training activities. Some species display tolerance or habituation to noise levels on Eglin. Wildlife could be struck during maintenance activities, but many animals would likely be aware of such activities and would move from the affected area. Similarly, many individuals would likely move away from affected areas during herbicide application. Injury or mortality could potentially occur from prescribed fires but would likely affect a relatively small number of animals. Noise and general disturbance could cause wildlife to leave or avoid certain areas, but such impacts would generally be intermittent and short term in duration. Prescribed fire, herbicide application, tree removal, and mowing and bush hogging would represent ongoing habitat alteration. Some maintenance activities could	Potential impacts on biological resources resulting from range clearance and maintenance activities would the same as those described for the No Action Alternative. Minor construction, demolition, renovation, facility modification, and land clearing would potentially result in direct strikes, habitat loss and alteration, and noise and other disturbance. A relatively small number of animals would likely be affected, and habitat impacts would not result in detectable population-level effects to any species. The effects of radar use at TA A-73 would be like those described for similar activities under the No Action Alternative and would not likely result in population-levels effects on wildlife, including protected species.

Table 2-3. Summary of Impacts by Alternative

Resource	No Action Alternative	Alternative 1
	result in erosion. The potential for introducing or spreading invasive plant species would be reduced by management practices. Herbicide use would occur in accordance with Eglin requirements. Although there would be adverse impacts to biological resources, with implementation of management practices, significant impacts would not be expected as a result of testing and training activities or maintenance activities.	
Cultural Resources	No additional impacts would occur as a result of the No Action Alternative beyond the impacts already occurring in Range A and Range B. NRHP eligible or potentially eligible cultural resources are required to be avoided per the ICRMP. NRHP-eligible or potentially eligible buildings are required to be maintained in order for the structure to continue to be eligible for NRHP status. Therefore, no NRHP-eligible or potentially eligible site or building is expected to be degraded. Potential degradation of cultural resources is only anticipated in locations without cultural surveys. Range activities in some of these areas may be too unsafe due to UXO to perform additional cultural surveys.	All the impacts identified in the No Action Alternative would occur under Alternative 1.
Geology and Soils	There would be no significant impacts associated with geology and soils under the No Action Alternative. Management of soils and surface vegetation, clearing and construction on test areas within the study area would continue to be conducted in accordance with all applicable environmental compliance regulations and Eglin environmental management plans. Management restrictions would ensure that any additional ground-disturbing activities would follow BMPs and current regulations. Test area and road maintenance activities would follow management practices regarding erosion prevention.	There would be no significant impacts associated with soils and erosion under Alternative 1. Potential impacts related to testing/training and maintenance would remain the same as described for the No Action Alternative. Management practices regarding surface vegetation, clearing and construction would continue to be implemented as required based upon the proposed activity.
Hazardous Materials and Waste	There would be no significant impacts associated with hazardous materials/waste and debris under the No Action Alternative. Management of hazardous materials/waste and debris on test areas within the study area would continue to be conducted in accordance with all applicable environmental compliance regulations and Eglin environmental management plans. Management restrictions would ensure that no ground-disturbing activities occur in Environmental Restoration Program or Legacy Debris Pit sites, and test/training areas would continue to be policed and debris removed. Test area and road maintenance activities would follow management practices regarding transport, storage, use, and disposal of hazardous materials and waste.	There would be no significant impacts associated with hazardous materials/waste and debris under Alternative 1. Potential impacts related to testing/training and maintenance would remain the same as described for the No Action Alternative. Management practices regarding transport, storage, use, and disposal of hazardous materials/waste would continue to be implemented. Debris generated by construction and disposal activities would be managed and disposed of in accordance with applicable solid waste regulations and guidance.

Table 2-3. Summary of Impacts by Alternative

Resource	No Action Alternative	Alternative 1
Noise	Activity levels and associated noise levels would not change. There would be no additional noise impacts.	Noise generated during construction and maintenance activities would be temporary, lasting only for the duration of the project, and localized to the vicinity of construction activity. Off-installation sensitive locations would not be affected. Time-averaged noise levels at off-installation sensitive locations would not change relative to levels associated with ongoing testing and training. Noise impacts would not be significant.
Safety	Controlled access of test areas/sites and surrounding areas would minimize the potential for direct impacts resulting from munitions, electromagnetic radiation, and UXO. Eglin has extensive expertise in managing wildfires that could be caused by range activities. Vegetation maintenance would decrease the potential for wildlife/aircraft strikes. Test area/site maintenance, road maintenance, debris removal, and UXO removal would result in increased safety. No significant health and safety risks have been identified that would result in disproportionate environmental health or safety risks to children and elderly populations.	Impacts related to safety would be the same as those described for the No Action Alternative.
Water Resources	Adverse impacts to water resources may include sedimentation, contamination, and hydrologic alteration from mission expenditures and improper/inadequate maintenance, primarily at stream crossings. Implementation of permit requirements and management actions would minimize the potential for such impacts. Although there could be adverse impacts, overall effects to water resources would not be significant. (See Table 3-55 in Section 3.9.1 (Water Resources, Affected Environment) for a list of potentially affected water resources at Eglin A and B Ranges.)	Potential impacts resulting from mission expenditures and maintenance would be like those of the No Action Alternative. The addition of activities at TA A-73 would not substantially change the overall potential for impacts, particularly with implementation of management actions. Land clearing and construction activities would follow permit requirements and management actions for erosion control, so impacts would be minimal. Although there could be adverse impacts to water resources in some locations, impacts to water resources would not be significant. (See Table 3-55 in Section 3.9.1 (Water Resources, Affected Environment) for a list of potentially affected water resources at Eglin A and B Ranges.)

% = percent; BMP = best management practice; ICRMP = Integrated Cultural Resources Management Plan; mm = millimeter; NRHP = National Register of Historic Places; TA = Test Area; UXO = unexploded ordnance

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

Tables provided in the Environmental Consequences section for each resource section provide a summary of potential effects resulting from proposed future actions at each test area. The symbols in the tables reflect the degree of effect without consideration of any mitigations outside those required by law as a result of regulatory permits that would be required as part of an alternative.

- "0" – The number 0 indicates activities may result in some beneficial or adverse environmental consequences, but the overall effect is one that can be termed neither beneficial nor adverse. These are impacts that are typically of a low intensity, such that they are imperceptible regardless of context or duration. Such impacts, whether beneficial or otherwise, are recoverable over the short term without mitigation and result in no overall perceptible change to the resource.
- "-" – A dash indicates there are potential adverse environmental consequences or burdens on the resource or that issues with the resource have been identified. Adverse impacts generally result in detriment or degradation of the impacted resource, the degree or level of impact directly related to the context, intensity, and duration of the impact. These are typically insignificant impacts, which are typically short- to medium-term impacts under any context or intensity. Beneficial impacts that are not significant in nature may include restoration of small pockets of wetlands. Adverse, but not significant, impacts are typically recoverable over the short-to-medium term, with mitigations required to minimize level of impact or potential for impact; the extent of mitigation is dependent on the identified context and intensity of the impact.
- "+" – A plus sign indicates unavoidable adverse environmental impact. Significant adverse impacts' physical aspects are easily perceptible and typically endure over the medium-to-long term, with a regional context and a high intensity; however, significant impacts can occur potentially over the short term under any context, given a high intensity. Significant adverse impacts are typically not recoverable over the short term and require long-term recovery processes with extensive mitigation.
- Split boxes – Split boxes represent a designation between two categories above. Some of the impacts would fall into one category, with others in a different category. Therefore, it is not certain what the overall impact to the resource would be.

3.1.1 Resources Not Carried Forward for Detailed Analysis

Table 3-1 details those resources that were not carried for forward for detailed analysis.

Table 3-1. Resources Eliminated from Detailed Analysis

Resource	Reason For Dismissal
Land Use	The Proposed Action would occur within the existing test areas/test sites and would not affect land use designations.
Socioeconomics	There would be no change to personnel associated with the Proposed Action that would impact population, economic activity (employment and income), housing, education, or public services. Eglin AFB would continue to be an important economic contributor to the region.
Utilities/Infrastructure	The Proposed Action would not disrupt or improve the existing level(s) of service and change demand and/or degrade the existing utilities/infrastructure systems.
Transportation	The level of service of public roadways would not be affected, and marked increases in the number of vehicles are not anticipated.
Visual/Aesthetics	None of the actions described in this EA would result in a change to the landscape visible to the public.

AFB = Air Force Base; EA = Environmental Assessment

3.1.2 Past, Present, Reasonably Foreseeable Future Actions

Chapter 3 (Affected Environment and Environmental Consequences) considers the environmental impact of the Proposed Action and alternatives. The cumulative environmental impact of the proposed training, testing, maintenance, and construction activities, when added to other reasonably foreseeable future actions. Since the Proposed Action would occur on Eglin AFB, the focus of the analysis is other reasonably foreseeable future projects and missions on Eglin AFB.

3.1.2.1 Past and Present Actions

Test and training activities have historically occurred on an ongoing basis throughout Eglin AFB, including test areas, estuarine and riverine areas, and the interstitial area. Ground movement, air to ground and ground-to-ground ordnance use, and other activities involving detonations and ground disturbance have occurred regularly, although the tempo and specific types of activities have changed according to prevailing requirements. Ongoing test and training activities, construction and demolition (C&D) projects, and natural resources management activities may potentially affect the resources discussed in this EA. In addition, past and current road, crossing, and training asset maintenance practices may impact multiple resources.

Military operations have been conducted at Eglin AFB for more than 80 years. Previous and ongoing military operations include a wide range of testing and training activities that are conducted on and over Eglin's land and water ranges, which encompass approximately 130,000 square miles of airspace and more than 50 test areas/test sites.

One of the primary actions associated with Eglin's mission has been the addition of 59 F-35 aircraft to the base's aircraft inventory (DAF, 2008b; DAF, 2014a). The aircraft were beddown as a result of a 2005 Base Realignment and Closure decision. Although 24 US Marine Corps and US Navy versions of the F-35s have been relocated to other installations in 2014 and 2019, respectively, environmental analysis is currently being conducted for potential replacement of these aircraft with DAF versions.

F-22 and T-38 aircraft associated with the F-22 Formal Training Unit, which is normally based at Tyndall AFB, were temporarily relocated to Eglin AFB in 2018 due to hurricane damage (DAF, 2019b). The last of Tyndall's F-22 fleet left Eglin AFB in 2023.

Previously, 18 C-146A aircraft were beddown at Duke Field to support special operations activities. Ongoing activities associated with air and ground gunnery missions, including crossing terrain on foot and in vehicles and small arms use, are described in the *Air and Ground Gunnery: Test Areas A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* (DAF, 2013a).

The various testing and training operations conducted on and over Eglin's land and water ranges will continue in the foreseeable future. Future operations will change as needed in line with changes in weapon technology, warfighting tactics, and the DOD mission requirements.

Various projects involving C&D activities, such as improvements to existing on-base facilities, roads, and utility systems, and construction of new infrastructure, have been conducted as needed to support Eglin's mission. Examples include construction of facilities to support the F 35 aircraft beddown at Eglin AFB and C-146A aircraft at Duke Field, placement of an on-base solar array farm at Eglin AFB (DAF, 2015), and recently completed and ongoing construction of new military housing at Eglin AFB as part of the DAF's military housing privatization initiative.

Natural resources management activities are conducted on the Eglin AFB military complex, including the interstitial area, in accordance with the base's Integrated Natural Resources Management Plan (INRMP) (Eglin AFB, 2022) and component plans. The INRMP provides guidance for wildlife, fire, and forest management activities that are intended to sustain and restore aquatic and terrestrial ecosystems and associated wildlife on and near the installation. The INRMP guides management actions related to fish and wildlife (including protected species), outdoor recreation, water resources, and wetlands, among other resources. Some management actions, such as prescribed fire, wildfire suppression, and erosion control efforts, may affect resources addressed in this EA.

3.1.2.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions that could affect existing resources on the Eglin Reservation include additional aircraft, infrastructure projects, and major maintenance activities. An estimated 12 aircraft could be based at Eglin AFB to provide dedicated adversary air operations and improve the quality of training and readiness of pilots of the 33rd Fighter Wing (DAF, 2019b). Infrastructure improvements will likely continue in support of Eglin's mission. Potential representative projects include repair of a railway spur that extends onto the Eglin Reservation, construction of facilities to support the Aviation Foreign Internal Defense program at Duke Field (DAF, 2020a).

Future major maintenance actions associated with roads, road crossings, bridge and culvert repair/replacement, road closure/decommissioning, and training asset maintenance could be undertaken. These types of activities would be outside the scope of the routine maintenance activities described in Chapter 2 (Alternatives Including the Proposed Action) of this EA. Such activities may potentially affect the same environmental resources affected by the Proposed Action and would require evaluation in separate NEPA documentation.

3.2 AIR QUALITY

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the affected air basin, and the prevailing meteorological conditions. Pollutants such as ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, and particulate matter (PM), are considered criteria air pollutants for which an ambient air quality standard has been set.

The applicable standards for criteria pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare. Based on measured ambient air pollutant concentrations, the US Environmental Protection Agency (USEPA) designates whether areas of the United States meet the NAAQS. Those areas demonstrating compliance with the NAAQS are considered attainment areas, while those areas not in compliance are known as nonattainment areas. Nonattainment areas that have attained the NAAQS are designated as maintenance areas.

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates Earth's temperature. Common GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride, sulfur hexafluoride (SF_6), and water vapor. Cumulative GHG emissions from all sources, worldwide, can increase heat in the atmosphere, which has the potential to impact average global temperatures. Currently, there are no standards like the NAAQS for GHGs.

3.2.1 Affected Environment

Air emissions resulting from implementation of the Proposed Action would primarily affect air quality within the region of influence (ROI), which encompasses Okaloosa, Walton, and Santa Rosa Counties. USEPA designates this ROI as an attainment area for all criteria pollutants under the NAAQS, meaning the region meets or exceeds the air quality standards set to protect human health and the environment.

An air emissions inventory qualitatively and quantitatively describes the amount of emissions from a facility or within an area. Emissions inventories are designed to locate pollution sources, define the type and size of the sources, characterize emissions from each source, and estimate total mass emissions generated over a period of time, generally a year. Inventory data establish relative contributions to air pollution concerns by classifying sources and determining the adequacy, as well as the necessity, of air regulations.

This section provides a baseline emissions inventory for the ROI and an overview of testing and training activities at various test areas that contribute to localized air quality impacts. These test areas support a range of activities, such as radar testing, live-fire training, and aircraft operations, which generate emissions specific to the type and intensity of the activities conducted. Detailed descriptions of these test areas are included below to supplement the baseline analysis.

Table 3-2 presents USEPA's 2020 National Emissions Inventory data for Okaloosa, Walton and Santa Rosa Counties (USEPA, 2025). The county data include emissions 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 whose emissions are too small to track individually, such as a home or small office building or a diffuse stationary source, such as wildfires or agricultural tilling. Mobile sources are any kind of vehicle or equipment with a gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and nonroad. On-road mobile sources consist of 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.

Table 3-2 Baseline Air Pollutant Emissions for Okaloosa, Walton, and Santa Rosa Counties

County	Emissions (tpy)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOCs	CO_2e
Okaloosa County	65,698	3,844	6,887	4,642	416	42,198	2,152,249
Santa Rosa County	58,066	4,906	6,222	4,141	1,223	41,002	3,145,657
Walton County	44,620	2,843	5,689	3,241	281	37,232	1,370,245
Total Region of Influence	168,385	11,593	18,799	12,023	1,920	120,433	6,668,151

Source: (USEPA, 2025)
CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; SO_x = sulfur oxides; tpy = tons per year; VOC = volatile organic compound

The six primary GHGs are CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. Only emissions of CO_2, CH_4, and N_2O are considered in this EA; the other constituents do not apply. 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 Earth's surface. The GWP rating system is standardized to CO_2, which has a value of one. To simplify GHG analyses, total GHG emissions from a source are often expressed as carbon dioxide equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single combined emissions rate representing all GHGs.

3.2.1.1 Air Quality in the Vicinity of Test Areas

The affected environment includes several test areas where emissions from testing and training activities influence local air quality. These test areas are subject to emissions regulations under the NAAQS and contribute to localized and regional air quality conditions. Detailed descriptions of the test areas and their emissions sources are provided below.

3.2.1.1.1 TA A-73

TA A-73 is a test site that includes infrastructure such as test towers and security facilities. Emissions may result from radar equipment operation, vehicle use, and maintenance activities.

3.2.1.1.2 TA A-77

TA A-77 supports air-to-ground and surface-to-surface tactical training, including live-fire training in urban simulated villages. Activities contributing to air emissions include weapons firing, vehicle use, and construction of training infrastructure.

3.2.1.1.3 TA A-78

TA A-78 is used for air-to-ground tactical training and includes live-fire impact areas and a simulated village. Air quality impacts may stem from weapons firing, tactical vehicle maneuvers, and small arms training.

3.2.1.1.4 TA A-79

TA A-79 is inactive and closed to mission activity, reducing the likelihood of substantial emissions. Historical use as an air-to-water target area and the potential for UXOs are noted, but current emissions are limited.

3.2.1.1.5 TA A-90

TA A-90 serves as a SAR with no permanent electrical or communications infrastructure. Emissions may result from small arms firing and vehicle operations supporting training activities.

3.2.1.1.6 TA B-7

TA B-7 supports air-to-ground training by AC-130 aircraft with a dedicated impact area for side-firing weapon systems. Emissions are primarily from aircraft operations and weapons firing.

3.2.1.1.7 TA B-12

TA B-12, known as Field 7, is used for precision-guided munitions testing, ground tactical training, and aircraft operations. Air emissions occur from aircraft, vehicles, and munitions testing.

3.2.1.1.8 TAs B-70, B-71, B-75, and B-82

These areas support similar training and testing activities involving aircraft operations, weapons firing, and ground tactical maneuvers. Emissions are expected to be comparable to those that occur at other active test areas.

3.2.2 Environmental Consequences

The air quality analysis estimated the magnitude of emissions that would result from the project alternatives. Version 5.0.23a of the DAF Air Conformity Applicability Model (ACAM) was used to estimate air emissions that would be generated by maintenance, construction, and/or operational activities (Solutio Environmental, 2022). The analysis also used emissions factors developed by USEPA to estimate emissions from proposed munitions usage by aircraft.

The analysis of criteria pollutant impacts from aircraft operations is limited to operations that would occur within the lowest part of the atmosphere known as the mixing layer, because this is where the release of aircraft emissions would affect ground-level pollutant concentrations. In general, aircraft emissions released above the mixing layer would not appreciably affect ground-level air quality. In accordance with the General Conformity Regulation (40 CFR Part 93 Subpart B), where the applicable State Implementation Plan or Transportation Implementation Plan does not specify a mixing height, the federal agency can use 3,000 feet above ground level (AGL) as a default mixing height. Since the State Implementation Plan for the locations of proposed activities does not specify a mixing height, the analysis used 3,000 feet AGL as a default mixing height. No increases in aircraft operations are expected for the airspaces. As a result, these areas were not considered in the air quality analysis (although potential noise impacts associated with ongoing activities in these areas were evaluated separately in the project noise analysis).

To estimate total GHG emissions that would occur from the project alternatives, the analysis included aircraft operations within the immediate Eglin AFB ROI, plus aircraft sorties between Eglin AFB and affected airspaces and training areas, and operations within these areas, regardless of aircraft altitude.

The air quality analysis estimated the effects of the proposed activities by comparing the increase in annual criteria pollutant emissions to applicable General Conformity Regulation de minimis thresholds within affected nonattainment/maintenance areas or insignificance indicators for attainment areas (AFCEC/CZTQ, 2023). The ROI currently attains all NAAQS, and the insignificance indicator used to evaluate actions in such areas is the USEPA Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year (tpy) of a criteria pollutant besides lead. The insignificance indicator for lead in this area is 25 tpy. The insignificance indicators do not denote a significant impact; however, they do provide a threshold to identify actions that have insignificant impacts to air quality. Any action with net emissions below the insignificance indicators is considered so insignificant that the action would not cause or contribute to an exceedance of any NAAQS.

Regarding effects from proposed GHG emissions, the analysis used the PSD threshold for GHGs of 75,000 tpy of CO_2e(or 68,039 metric tpy) as an indicator or threshold of insignificance for NEPA air quality impacts. A source this large would trigger major source PSD permitting requirements for GHGs, assuming the source first triggered PSD permitting for another regulated pollutant. Actions with a net change in GHG (CO_2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis.

3.2.2.1 No Action Alternative

3.2.2.1.1 TAs A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Due to the nature of air emissions, which are dispersed by wind patterns, and the subsequent regional nature of potential air quality impacts, air emissions impact analysis was conducted on a regional basis encompassing all of the test areas/test sites considered under the Proposed Action. This represents a more realistic scenario than analyzing each area separately, as emissions from all of the areas would be potentially combined and dispersed within the ROI during the course of operations.

Emissions associated with munitions, ordnance, and other detonations were calculated for the ROI using emissions factors from USEPA's *AP-42: Compilation of Air Emissions Factors from Stationary Sources*, Chapter 15 (Ordnance Detonation) (USEPA, 2024).

Emissions associated with maintenance, including test area/site maintenance, road maintenance, vegetation control, and other periodic activities/operations, were estimated using Version 5.0.23a of the DAF ACAM (Solutio Environmental, 2022). Activity data developed for this project were used as inputs to ACAM. Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the applicant, relevant experience with similar projects when specifics were not known, and ACAM defaults.

Because it is not known how many miles of road or how much area on the test areas/sites would require maintenance in a given year, and because these quantities are likely to vary year to year, assumptions for emissions calculations were made based on routine maintenance requirements. For grading, it was assumed that 10 miles of unpaved roads, at a width of 12 to 15 feet, would be graded annually, totaling approximately 792,000 square feet. For paving, it was assumed that 5 percent of paved road surfaces, or 31,680 square feet, would be patched or resurfaced annually. These activities are assumed to occur intermittently throughout the year. Material assumptions include 370 cubic yards of material hauled on site and 37 cubic yards hauled off site for grading and paving operations. Annual emissions were based on grading 792,000 square feet and paving 31,680 square feet per year.

Table 3-3 presents the annual emissions estimated for the No Action Alternative. These data show that emissions from the alternative would not exceed any insignificance indicator threshold. Therefore, activities under the No Action Alternative would not result in significant air quality impacts. Activities from the No Action Alternative have been ongoing for years, and its emissions contribute to the existing air quality of the ROI, which has remained in attainment for all criteria pollutants.

Table 3-3 Annual Emissions – No Action Alternative

Source	Annual Emissions (tpy)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOCs	CO_2e
Munitions	6.86	0.63	3.47	6.47	0.00	0.00	82.40
Maintenance	6.18	5.32	94.77	0.20	0.01	0.62	1,366
Total Annual Emissions	13.04	5.95	98.24	6.67	0.01	0.62	1,448
Insignificance Indicator	250	250	250	250	250	250	68,039
Exceed Threshold Indicator?	No	No	No	No	No	No	No

Source: (USEPA, 2025)

< = less than; CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; SO_x = sulfur oxides; tpy = tons per year; VOC = volatile organic compound

Note: Total lead (Pb) emissions would be < 0.001 tpy, substantially less than the insignificance indicator of 25 tpy.

3.2.2.2 Alternative 1 (Current Plus Future)

3.2.2.2.1 TAs A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Consistent with the approach described under the No Action Alternative, the air emissions impact analysis for Alternative 1 was conducted on a regional basis. This approach considers all test areas under the Proposed Action as one, reflecting a more realistic scenario than analyzing each area individually. By accounting for the potential combination and dispersion of emissions within the ROI, this method provides a comprehensive assessment of air quality impacts.

Under Alternative 1, emissions would result from munitions expenditures, construction, and maintenance activities. These activities have been analyzed to assess potential impacts on air quality within the regional ROI. Table 3-4 summarizes the annual emissions of criteria pollutants and GHGs (GHGs, presented as CO_2e) associated with the activities under Alternative 1.

Table 3-4. Alternative 1 Emissions (Current Plus Future)

Source	Annual Emissions (tpy)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOCs	CO_2e
Munitions	6.87	0.63	3.47	6.47	0.00	0.00	82.4
Construction/Maintenance	10.9	8.69	204	0.31	0.02	1.29	2,298
Total Annual Emissions	17.77	9.32	207	6.78	0.02	1.29	2,380
Insignificance Indicator	250	250	250	250	250	250	68,039
Exceed Threshold Indicator?	No	No	No	No	No	No	No

Source: (USEPA, 2025)

< = less than; CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; SO_x = sulfur oxides; tpy = tons per year; VOC = volatile organic compound

Note: Total lead (Pb) emissions would be < 0.001 tpy, substantially less than the insignificance indicator of 25 tpy.

The table includes emissions from the No Action Alternative in addition to the emissions specific to Alternative 1.

Emissions associated with munitions, ordnance, and other detonations were calculated using emissions factors from the *USEPA's AP-42: Compilation of Air Emissions Factors,* Chapter 15, Ordnance Detonation (USEPA, 2024), and are presented in the table under the category "Munitions."

Additionally, construction emissions under Alternative 1 include the installation of two new radar systems at TA A-73 and future projects, such as minor construction, demolition, renovations, and maintenance activities across the A and B Ranges. The EA allows for a maximum disturbance of up to 250 acres (10,890,000 square feet) over a 7-year period. These activities were assumed to include site grading, demolition, trenching, building construction, architectural coating, and paving. To evaluate annual impacts, the total projected activity was distributed evenly across the 7 years, and emissions were modeled accordingly. Emissions from construction and maintenance activities were modeled using Version 5.0.23a of the DAF ACAM (Solutio Environmental, 2022) and are presented in the table under "Construction/Maintenance."

Fugitive dust emissions (PM with a diameter of 10 microns or less [PM_{10}] and PM with a diameter of 2.5 microns or less [$PM_{2.5}$]) due to the operation of equipment and vehicles on bare soils would be reduced through the implementation of best management practices (BMPs), such as watering disturbed areas. The analysis assumed that this dust suppression BMP would reduce fugitive dust emissions by 50 percent from uncontrolled levels (Countess Environmental, 2006). Construction emissions would be geographically dispersed and would primarily occur in phases over the 7-year period, further reducing their annual impact.

Table 3-4 provides a comprehensive summary of annual emissions, including those associated with munitions use, construction, and maintenance activities under Alternative 1. The data indicate that emissions would remain below all insignificance indicator thresholds. Therefore, activities under Alternative 1 are not anticipated to result in significant air quality impacts.

3.2.2.3 Cumulative Effects

The Proposed Action (Alternative 1) would not have significant adverse cumulative impacts on air quality. Air emissions under the No Action Alternative are part of the existing air quality conditions. Air emissions associated with munitions expenditures, land and road maintenance and construction/demolition under Alternative 1 would be temporary, localized, and minor. Air emissions from infrastructure projects at Eglin AFB and in the surrounding area would result in intermittent and negligible emissions, and substantial increases in future mission-related air emissions are not expected. Therefore, the combination of air emissions from ongoing testing and training activities, Alternative 1, and unrelated regional actions is not expected to result in violations of any federal, state, or local air quality regulation, or otherwise significantly impact air quality.

3.2.2.4 Management Actions

To minimize potential air quality impacts associated with construction, munitions use, and maintenance activities under Alternative 1, the following BMPs and management measures will be implemented. These measures are designed to ensure compliance with applicable air quality regulations and to reduce emissions of criteria pollutants, hazardous air pollutants, and fugitive dust.

3.2.2.4.1 Construction and Demolition Activities

- Limit equipment idling times to reduce fuel consumption and associated emissions of carbon monoxide, nitrogen oxides, and PM_{10} and $PM_{2.5}$.
- Apply water or dust suppressants to disturbed soil surfaces, unpaved roads, and material stockpiles to minimize fugitive dust generation.
- Cover or securely contain materials transported in open-bed trucks to prevent the release of PM during transit.
- Conduct regular maintenance of construction equipment to ensure proper operation and minimize emissions of pollutants.
- Schedule C&D activities to avoid peak traffic times, reducing cumulative emissions in areas near sensitive receptors.

3.2.2.4.2 Range and Road Maintenance Activities

- Employ dust suppression methods, such as watering, applying chemical stabilizers, or using surface treatments, during vegetation clearing, road grading, and paving operations.
- Conduct routine equipment inspections and maintenance to prevent excessive emissions from poorly functioning machinery.
- Use low-emission or alternative-fuel vehicles and equipment where feasible to further reduce emissions.

3.2.2.4.3 Operational Activities

- Schedule training missions to avoid overlapping with other emissions-generating activities, thereby minimizing cumulative air quality impacts.
- Monitor operational emissions from training missions to ensure compliance with applicable air quality standards. Adjust operational schedules or implement additional mitigation measures if monitoring identifies potential exceedances.
- Implement operational BMPs to reduce fuel consumption and associated emissions during training missions.

3.2.2.4.4 Munitions Use

- Conduct environmental monitoring near areas with high munitions activity to identify potential air quality impacts from explosives residue, including potential releases of particulates and hazardous air pollutants.
- Use alternative or reduced-emission munitions, where feasible, to limit air quality impacts during training activities.

3.2.2.4.5 Monitoring and Compliance

The implementation of BMPs and management actions will be monitored and documented throughout all project phases to ensure compliance with air quality regulations and permits. Monitoring activities will include the following:

- **Construction Phase**: Regular inspections of construction sites to verify the use of BMPs, such as dust suppression, equipment maintenance, and covered material transport. Reports will document compliance with air quality management plans.
- **Operational Phase:** Emissions from training activities will be monitored, and operations will be adjusted as needed to ensure compliance with NAAQS. Cumulative emissions impacts will be evaluated periodically to identify any necessary changes to operational procedures.
- **Range and Road Maintenance**: Routine inspections will ensure the use of dust suppression and properly maintained equipment. Monitoring records will be maintained to demonstrate compliance with air quality standards.

If unanticipated air quality impacts are identified during project implementation, corrective actions will be taken to minimize emissions and ensure compliance with all applicable federal, state, and local air quality regulations.

3.3 BIOLOGICAL RESOURCES

Biological resources refer to the vegetation, wildlife, sensitive habitats, protected species, and invasive species that occur within the ROI. The ROI consists of the area within test area and test site boundaries, as well as adjacent areas supporting biological resources that could be affected by the activities identified in Chapter 2 (Alternatives Including the Proposed Action). For example, wildlife located near, but outside, a test area boundary could be affected by noise or other disturbance during testing or training activities.

Sensitive habitats consist of rare vegetation communities, wetlands and aquatic habitats (riparian areas and floodplains), and habitats for rare species. Protected species are those species protected by federal or state law, including threatened and endangered species and migratory birds. In general, migratory birds are defined as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. In the regulatory context of the Migratory Bird Treaty Act, a migratory bird belongs to a family or group of species for which the United States has signed migratory bird treaties with certain other nations (USFWS, 2020a). Migratory birds include most wild birds in the United States except the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), feral pigeons, and resident game birds (e.g., quail species).

Under the federal ESA, an endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Although federal candidate species and state-listed species have no protection under the ESA, they are given consideration during project planning. For example, the DAF has committed to voluntary conservation and management actions for the state-listed gopher tortoise (*Gopherus polyphemus*), as described in the Gopher Tortoise Programmatic Conference Opinion (USFWS, 2020b). All federally listed species that occur in Florida are included on Florida's list as federally designated "endangered" or federally designated "threatened" species. Species that are not federally listed but are at risk of extinction in Florida are called "state-designated threatened" species. One exception is the alligator snapping turtle (*Macrochelys temminckii*), which has been proposed for federal listing under the ESA and is designated as a state species of special concern (FWC, 2022).

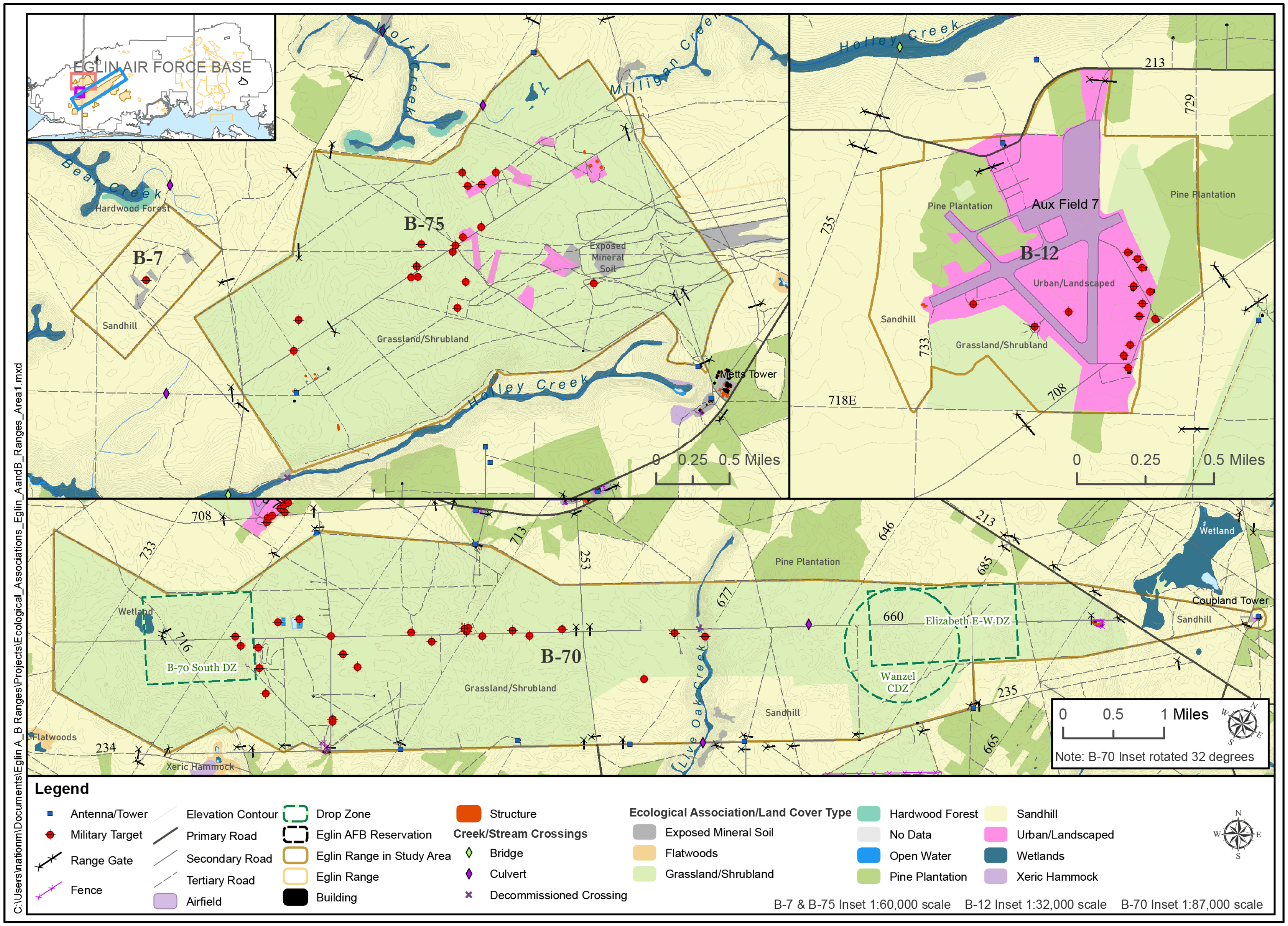
Invasive nonnative species are species that are not native to an ecosystem and that are likely to cause environmental or economic harm or that may harm human health.

3.3.1 Affected Environment

A summary of the biological resources that occur within the ROI is provided in this section. Detailed descriptions of vegetation communities, sensitive habitats, protected species, and invasive species are provided in Appendix A (Eglin A and B Ranges Biological Resources), the Eglin AFB INRMP and associated component plans (Eglin AFB, 2022), and the Florida Natural Areas Inventory (FNAI) *Guide to the Natural Communities of Florida* (FNAI, 2010).

Ecological Associations

Four broad ecological associations, which are defined by similarities of plants, animals, and geophysical characteristics, exist on Eglin AFB: sandhills, flatwoods, wetlands/riparian, and barrier island. Of these four ecosystem types, all except barrier island occur in portions of the ROI Figure 3-1 to Figure 3-3. Note that the wetland category on the figures includes various types of wetlands such as marshes, swamps, emergent vegetation wetlands, mixed forest wetland, and wet prairie, among others. Similarly, the flatwoods category includes mesic flatwood, scrubby flatwood, and wet flatwood. Pine plantation, artificially maintained open grasslands/shrublands, and urban/landscaped areas are also present. Descriptions of the primary ecological associations are provided in Appendix A (Eglin A and B Ranges Biological Resources).



1
2 **Figure 3-1. Ecological Associations on and Adjacent to TAs B-7, B-12, B-70, and B-75**

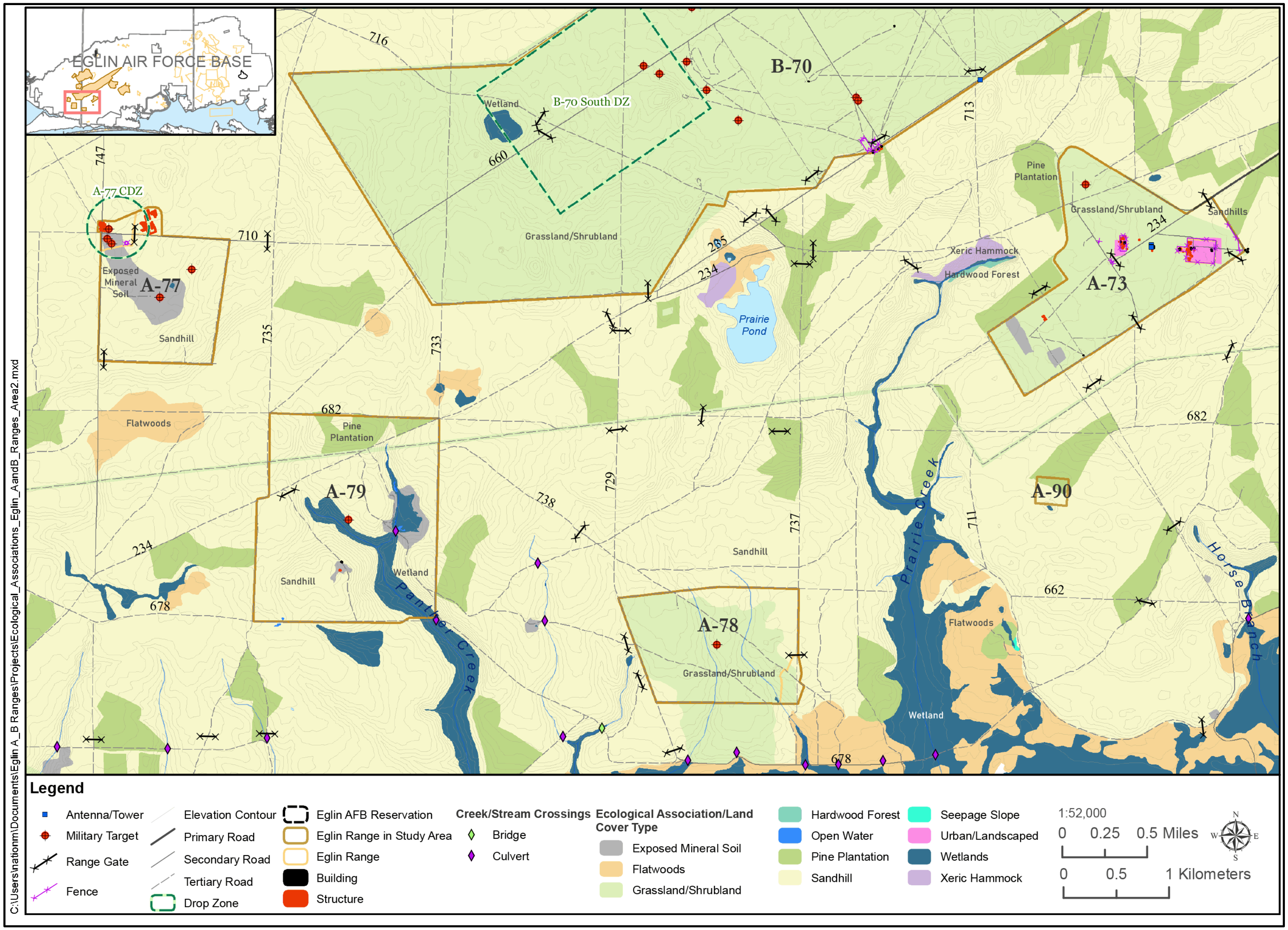
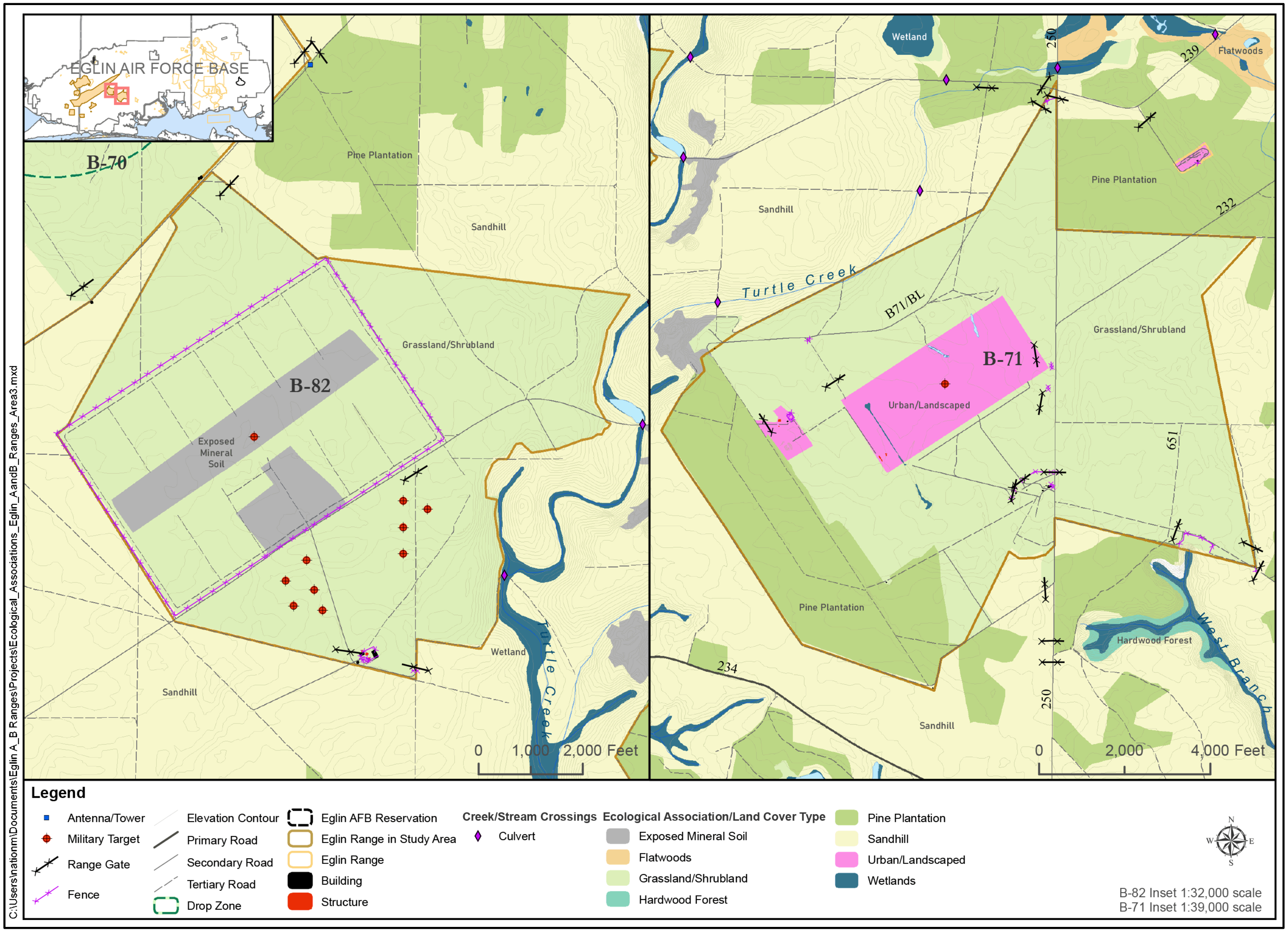


Figure 3-2. Ecological Associations on and Adjacent to TAs A-73, A-77, A-78, A-79, and A-90

1



2 **Figure 3-3. Ecological Associations on and Adjacent to TAs B-71 and B-82**

Vegetation and Wildlife

A wide variety of plant and wildlife species are associated with the various habitats on Eglin AFB. Representative plant and animal species commonly found within sandhills, flatwoods, wetlands/riparian, and open grasslands/shrublands habitats are listed in Table 3-5. The list is not a comprehensive inventory but is provided as a summary reference.

Table 3-5. Representative Plant and Animals Species of Eglin Air Force Base by Ecological Association

Plants		Animals	
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Sandhills			
Longleaf pine	*Pinus palustris*	Cottontail rabbit	*Sylvilagus floridanus*
Turkey oak	*Quercus laevis*	Bobwhite quail	*Colinus virginianus*
Blackjack oak	*Q. marilandica*	Great horned owl	*Bubo virginianus*
Bluejack oak	*Q. incana*	Gopher tortoise	*Gopherus polyphemus*
Wiregrass	*Aristida stricta*	Pocket gopher	*Geomys pinetus*
Saw palmetto	*Serenoa repens*	Diamondback rattlesnake	*Crotalus adamanteus*
Bracken fern	*Pteridium aquilinum*	Six-lined racerunner	*Aspidoscelis sexlineata*
Yaupon	*Ilex vomitoria*	Least shrew	*Cryptodus parva*
Gallberry	*Ilex glabra*	Raccoon	*Procyon lotor*
Pine-woods bluestem	*Andropogon arctatus*	White-tailed deer	*Castor canadensis*
Flatwoods			
Longleaf pine	*Pinus palustris*	Wood duck	*Aix sponsa*
Saw palmetto	*Serona repens*	Red-winged blackbird	*Agelaius phoenicius*
St. John's wort	*Hypericum brachyphyllum*	Cottonmouth water moccasin	*Agkistridon piscivorus*
Slash pine	*Pinus elliottii*	River otter	*Lutra canadensis*
Black titi	*Cliftonia monophylla*	American beaver	*Castor canadensis*
Milkweed	*Asclepias* spp.	Florida black bear	*Ursus americanus floridanus*
Pitcher plant	*Sarracenia* spp.	Gray fox	*Urocyon cinereoargenteus*
Wetland and Riparian Areas (freshwater)			
Yellow water-lily	*Nymphaea* spp.	Raccoon	*Procyon lotor*
Saw grass	*Cladium jamaicensis*	Florida black bear	*Ursus americanus floridanus*
Cattail	*Typha domingensis*	Sherman's fox squirrel	*Sciuris niger shermani*
Phragmites	*Phragmites australis*	American alligator	*Alligator mississippiensis*
White cedar	*Chamaecyparis thyoides*	Pine barrens tree frog	*Hyla andersonii*
Water tupelo	*Nyssa biflora*	Five-lined skink	*Plestiodon fasciatus*
Pitcher plant	*Sarracenis purpurea*	Green anole	*Anolis carolinensis*
Red titi	*Cyrilla racemiflora*	Garter snake	*Thamnophis sirtalis*
Tulip poplar	*Liriodendrom tulipifera*	Indigo snake	*Drymarchon couperi*
Sweet bay magnolia	*Magnolia virginiana*	American beaver	*Castor canadensis*
Red bay	*Persea borbonia*	Northern parula	*Setophaga americana*
Open Grasslands/Shrublands			
Switchgrass	*Panicum virgatum*	Red-shouldered hawk	*Buteo lineatus*
Broomsedge	*Andropogon virginicus*	Southeastern American kestrel	*Falco sparverius paulus*
Big bluestem	*Schizachyrium* spp.	Flycatcher	*Tyrannidae* spp.
Yellow Indiangrass	*Sorghastrum* spp.	Cotton mouse	*Peromyscus gossypinus*
Purple lovegrass	*Eragrostis spectabilis*	Slender glass lizard	*Ophisaurus attenuatus*

spp. = species

Sensitive Habitats

Sensitive habitats occurring in the ROI include areas designated by the FNAI program, streams, wetlands, and floodplains. FNAI surveys at Eglin AFB identified numerous areas distinguished by the uniqueness of the community, ecological condition, species diversity, and presence of rare species. These areas are called High Quality Natural Communities (HQNCs). FNAI also identified Significant Botanical Sites, which are habitats that support rare plants. On a larger scale, FNAI identified landscapes containing complexes of HQNCs and rare species, which are called Outstanding Natural Areas (ONAs). These landscapes contain the highest-quality natural communities on the installation.

Surface water occurrence on Eglin AFB is extensive and includes a substantial stream network. Streams may function as habitat, drinking water sources, and foraging areas for a variety of wildlife. Wetlands are productive ecosystems that provide food and shelter for many different plant and animal species. Floodplains are lowland areas adjacent to surface water bodies that are periodically covered by water during flooding events. Floodplains, which often contain riparian vegetation, are biologically unique and diverse ecosystems that may support a rich diversity of aquatic and terrestrial species. The locations of sensitive habitats throughout the ROI are shown in Figure 3-4 to Figure 3-6.

Protected Species

ESA-listed species that occur in the ROI consist of the reticulated flatwoods salamander (*Ambystoma bishopi*), red-cockaded woodpecker (RCW) (*Dryobates borealis*), and eastern indigo snake (*Drymarchon corais couperi*). In 2022, the USFWS determined that the eastern distinct population segment of the gopher tortoise (*Gopherus polyphemus*) is not warranted for listing under the ESA. However, the gopher tortoise remains a state-designated threatened species, and the DAF will continue to implement voluntary conservation and management actions for the species, as described in the *Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). The Okaloosa darter (*Etheostoma okaloosae*) was removed from the federal list of endangered and threatened species in 2023 due to recovery but remains a state-designated threatened species. Eglin AFB will continue to implement management practices contained in the Okaloosa darter *Post-Delisting Monitoring Plan* (USFWS, 2022a).

The alligator snapping turtle (*Macrochelys temminckii*), tricolored bat (*Perimyotis subflavus*), and monarch butterfly (*Danaus plexippus*) were proposed for ESA listing in 2001, 2022, and 2024, respectively. Other federally protected species in the ROI include numerous migratory bird species. State-protected wildlife consists of the Florida pine snake (*Pituophis melanoleucus mugitus*), southeastern American kestrel (*Falco sparverius paulus*), little blue heron (*Egretta caerulea*), and Florida burrowing owl (*Athene cunicularia floridana*). Over 50 state-protected plant species are thought to occur or potentially occur on Eglin AFB seasonally or year-round; refer to the INRMP threatened and endangered species component plan (Eglin AFB, 2020a) for a current list. The regulatory status of protected animal species is provided in Table 3-6, and species/species group summary descriptions are provided following the table. Detailed descriptions are provided in Appendix A (Eglin A and B Ranges Biological Resources). The locations of protected species in the ROI, for which geospatial data are available, are shown in Figure 3-4 to Figure 3-6. While the location of some protected species or habitat components is relatively fixed (e.g., RCW cavity trees), habitat for other species such as the eastern indigo snake and migratory birds is widespread, and these species could occur in many areas of the ROI.

Table 3-6. Protected Species With Known or Potential Occurrence in the Region of Influence

Common Name	Scientific Name	Status
Reticulated flatwoods salamander	*Ambystoma bishopi*	FE
Red-cockaded woodpecker	*Dryobates borealis*	FT
Eastern indigo snake	*Drymarchon corais couperi*	FT
Tricolored bat	*Perimyotis subflavus*	PFE
Alligator snapping turtle	*Macrochelys temminckii*	PFT
Monarch butterfly	*Danaus plexippus*	PFT
Okaloosa darter	*Etheostoma okaloosae*	ST
Gopher tortoise	*Gopherus polyphemus*	ST
Florida pine snake	*Pituophis melanoleucus mugitus*	ST
Southeastern American kestrel	*Falco sparverius paulus*	ST
Little blue heron	*Egretta caerulea*	ST
Florida burrowing owl	*Athene cunicularia floridana*	ST
Migratory birds	Multiple species	MBTA

FE = federally endangered; FT = federally threatened; MBTA = Migratory Bird Treaty Act; PFE = proposed as federally endangered; PFT = proposed as federally threatened; ST = state threatened

Reticulated Flatwoods Salamander. The reticulated flatwoods salamander, federally listed as an endangered species, occurs in open, moderately wet pine woodlands that are maintained by frequent fires and that contain shallow, ephemeral wetland ponds. Flatwoods salamanders migrate to these wetlands from October to December to breed. During the non-breeding season, individuals may disperse long distances to upland sites. The primary threat to the flatwoods salamander is habitat loss and alteration. On Eglin AFB, the core habitat areas are the Eastbay Flatwoods and Oglesby/Alligator Creek, and Eglin's primary goal is to maintain and recover populations within these areas. Accordingly, Eglin prepared a Conservation Plan (Eglin AFB, 2017) for the flatwoods salamander as part of an ESA Section 7(a)(1) agreement (USFWS, 2017). The agreement documents voluntary planning and management that Eglin will undertake within the Escribano Point Water Management Area. Eglin implements a 1,500-foot buffer area from the edge of ponds in the Eastbay Flatwoods and Oglesby/Alligator Creek geographic areas, within which ground-disturbing activities are restricted.

Red-Cockaded Woodpecker. The RCW is federally listed as a threatened species. The USFWS reclassified (downlisted) the RCW from endangered to threatened in October 2024 (89 *Federal Register* 85294). RCWs inhabit pine forests in the southeastern United States, from North Carolina to eastern Texas. The RCW excavates cavities primarily in live longleaf pine trees that are at least 85 years old. The greatest threat to the RCW is habitat loss and fragmentation.

Eastern Indigo Snake. The eastern indigo snake, federally listed as a threatened species, is the largest nonvenomous snake in North America. Indigo snakes frequently utilize gopher tortoise burrows and the burrows of other species for overwintering. The snake often occurs in flatwoods, hammocks, stream bottoms, riparian thickets, and high ground with well-drained, sandy soils. The indigo snake could occur anywhere on the Eglin Range because it uses such a wide variety of habitats. However, the species is extremely uncommon.

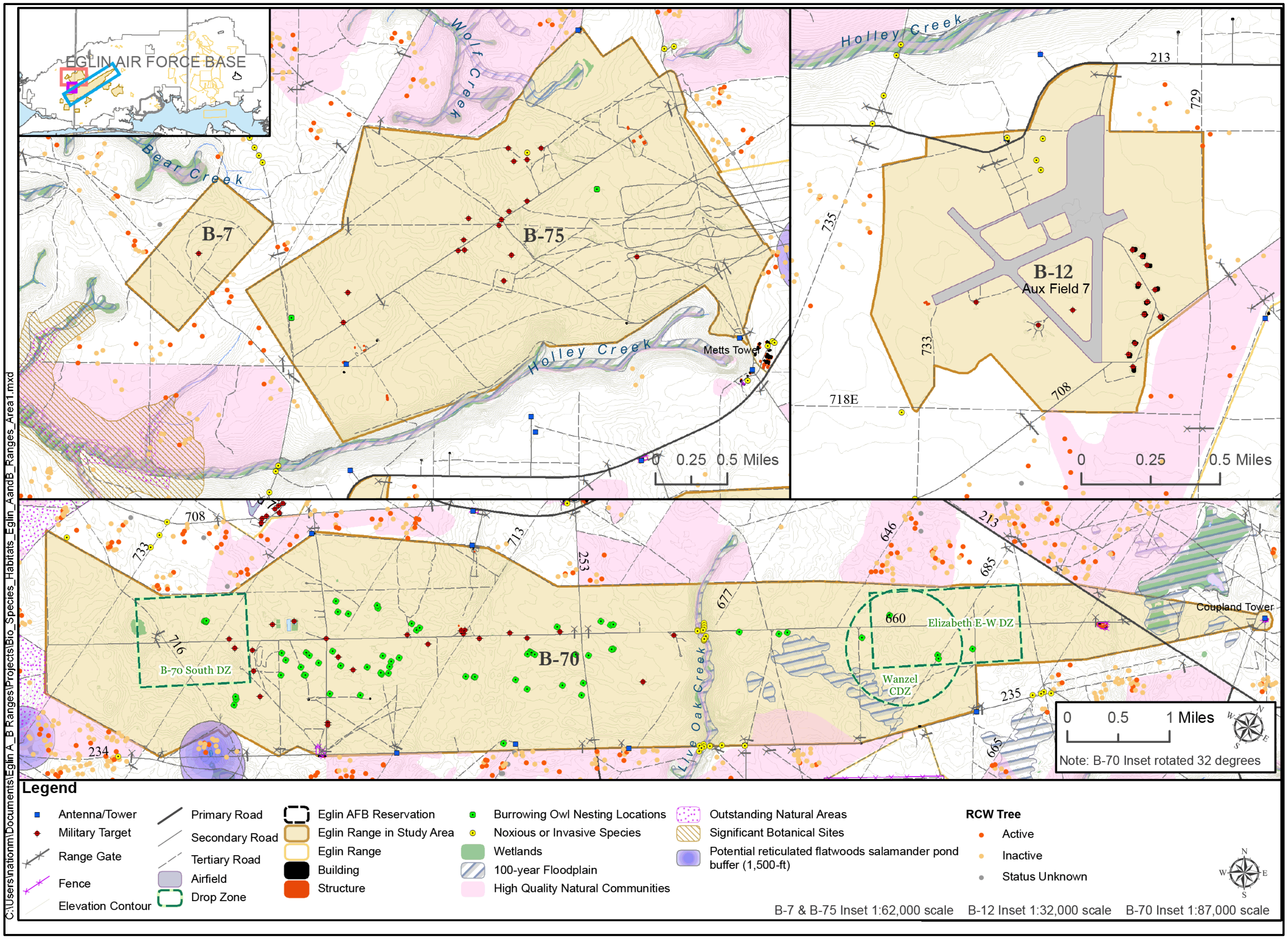


Figure 3-4. Sensitive Habitats, Protected Species, and Invasive Plant Species on TAs B-7, B-12, B-70, and B-75

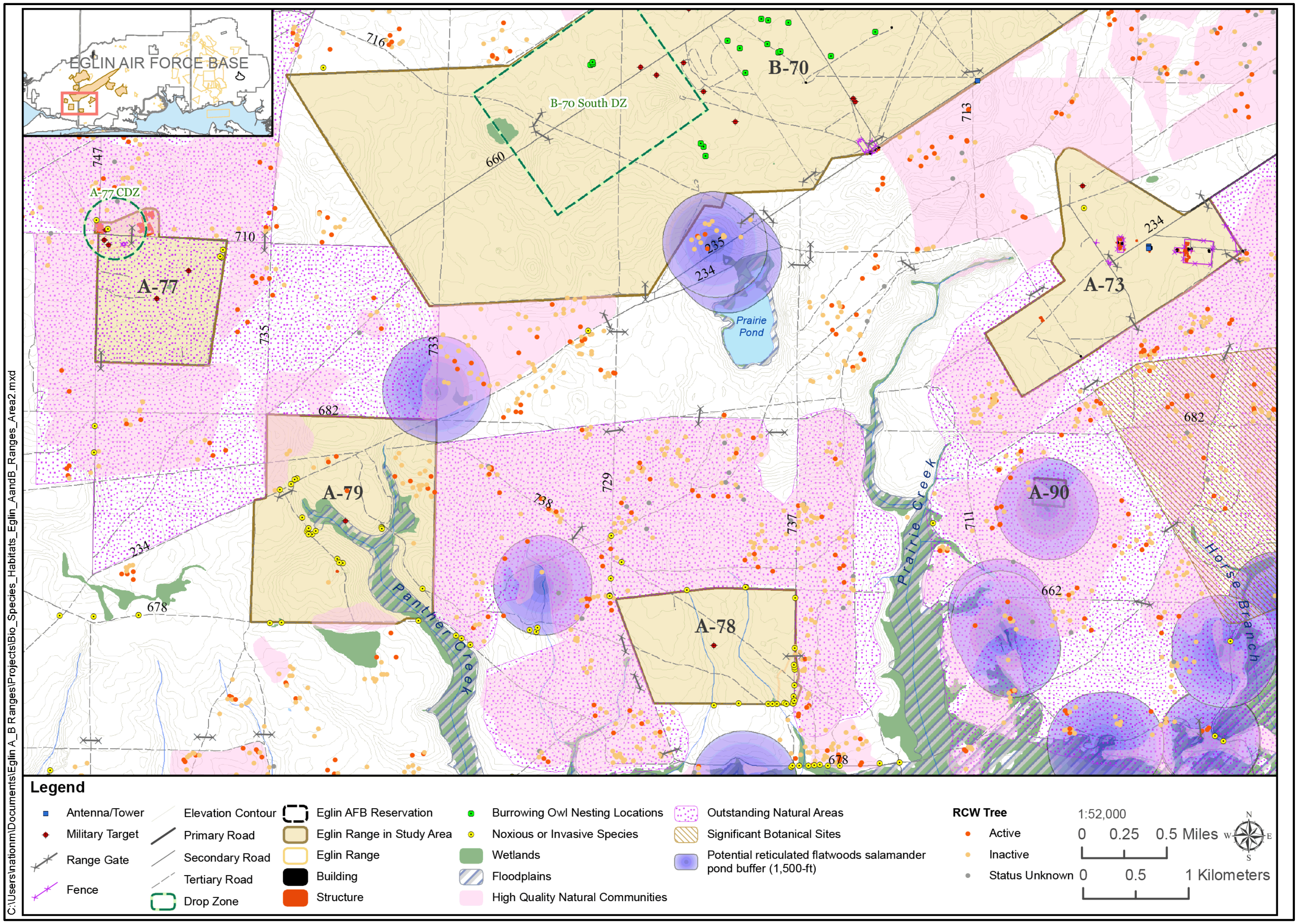


Figure 3-5. Sensitive Habitats, Protected Species, and Invasive Plant Species on TAs A-73, A-77, A-78, A-79, and A-90

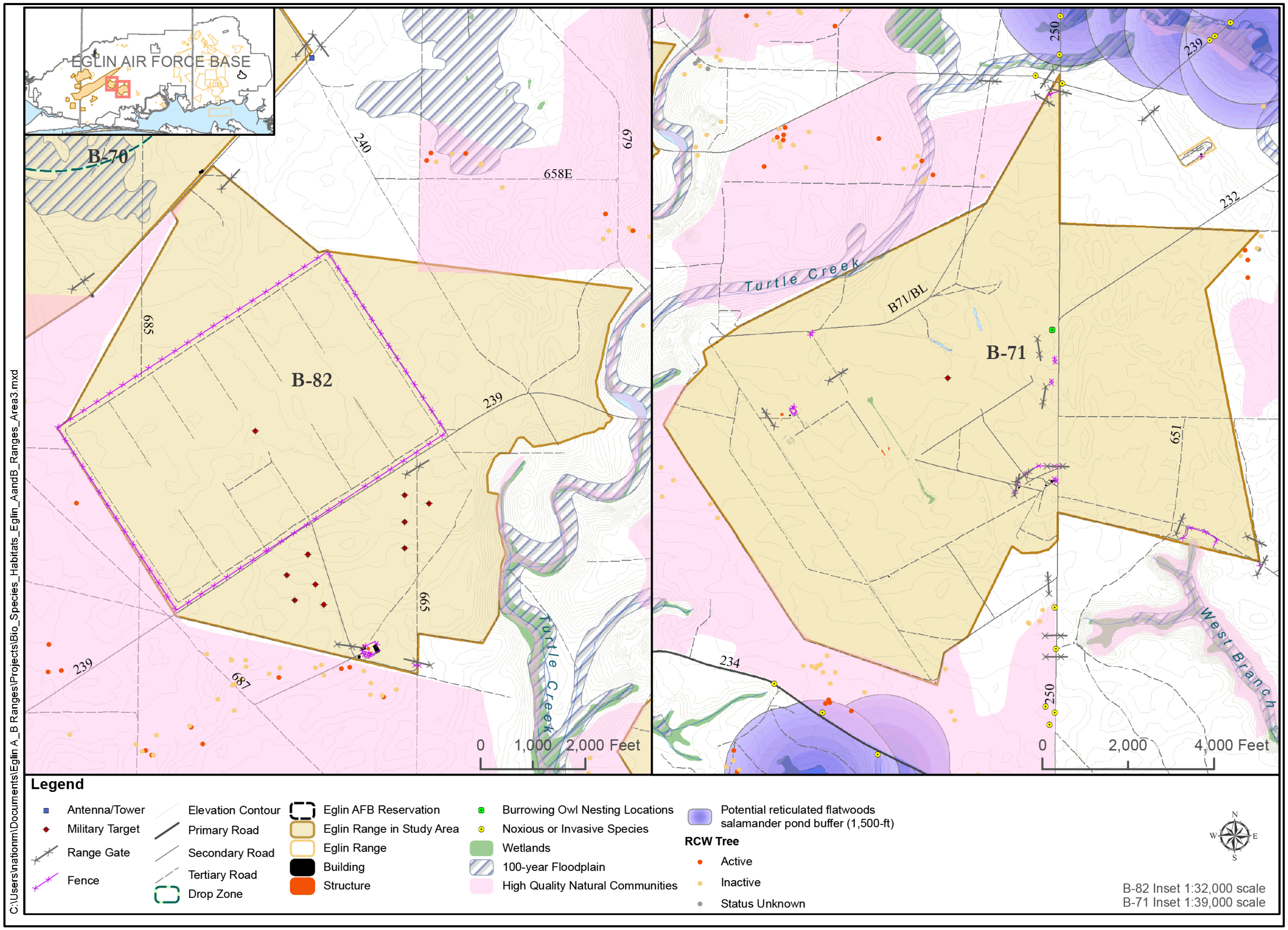


Figure 3-6. Sensitive Habitats, Protected Species, and Invasive Plant Species on TAs B-71 and B-82

Tricolored Bat. The tricolored bat was proposed for listing as endangered under the ESA in 2022 (87 *Federal Register* 56381). During winter, individuals hibernate mostly in caves and mines. During spring, summer, and fall, tricolored bats occur in wooded areas where they roost primarily in trees, although they may also use structures such as buildings and bridges. Tricolored bats feed between dusk and dawn near trees, along waterways, and in riparian habitat. The greatest threats to the species are white-nose syndrome and mortality associated with wind energy turbine strikes.

Alligator Snapping Turtle. The alligator snapping turtle was proposed for listing as threatened under the ESA (with a Section 4(d) rule) in 2021 (86 *Federal Register* 62434). These turtles may occur in rivers, lakes, backwater swamps, and brackish water systems. Individuals may use seepage streams on Eglin AFB (FWC, 2011). Primary threats to this species are harvest, fishing bycatch, hook ingestion, habitat alteration, and nest predation (USFWS, 2023).

Monarch Butterfly. The USFWS proposed to list the monarch butterfly (*Danaus plexippus*) as threatened under the ESA (with a Section 4(d) rule) in 2024 (89 *Federal Register* 100662). The eastern North America population migrates annually between Canada and overwintering sites in central Mexico (USFWS, 2022b). Occurrence in the ROI extends from about March to November. Adults feed on a variety of blooming nectar resources. Primary threats to the species are habitat loss and insecticide exposure.

Okaloosa Darter. The state-designated threatened Okaloosa darter, which was removed from the federal list of endangered and threatened species in 2023 due to recovery, is a small fish that inhabits streams fed by groundwater seepage. This species is found only in the tributaries and main channels of the following creeks, which drain into two bayous of Choctawhatchee Bay: Toms, Turkey, Mill, Swift, Turkey-Bolton (also known as East Turkey), and Rocky Creeks. Most darter habitat occurs within the Eglin AFB boundary (FWC, 2023a). Darters are usually found in and around root masses of streamside vegetation and woody debris. Primary threats are hydrologic alteration, siltation, and temperature alteration from roads, culverts, clay pits, and beaver dams.

Gopher Tortoise. The state-designated threatened gopher tortoise is found primarily within the sandhills and open grassland ecological associations on the Eglin Range, where it excavates a tunnel-like burrow for shelter from predators, fire, and temperature extremes. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Gopher tortoise burrows serve as important habitat for many other species, including the federally listed eastern indigo snake. In 2022, the USFWS determined that the eastern distinct population segment of the species (which includes tortoises on Eglin AFB) is not warranted for listing under the ESA. All DoD entities, including the DAF, signed a Candidate Conservation Agreement with the USFWS in 2008 (updated in 2012). This agreement defines what each agency will voluntarily do to conserve the gopher tortoise and its habitat. In 2020, the USFWS issued a Conference Opinion, which identifies conservation measures related to activities conducted on Eglin AFB (USFWS, 2020b).

Florida Pine Snake. The state-designated threatened Florida pine snake, one of the largest snakes in eastern North America, occurs throughout most of the state (FWC, 2023b). The species inhabits areas with well-drained sandy soils and a moderate to open canopy, including sandhills, former sandhill areas, pine scrub, and scrubby flatwoods (FNAI, 2001).

Southeastern American Kestrel. The state-designated threatened southeastern American kestrel's habitat in Florida includes open woodlands, sandhills, fire-maintained savannah pine habitats, and riparian areas. Kestrels prefer open or partly open sandhill habitat. On Eglin, kestrels frequently use cleared test areas for foraging. Kestrels nest in cavities that have been excavated in large trees, including longleaf pines, by woodpeckers or squirrels. Nest boxes are also used, although individuals were found to primarily use natural large secondary cavities for nesting on Eglin AFB (Blanc & Walters, 2008).

Little Blue Heron. The state-designated threatened little blue heron is a small wading bird that occupies fresh, salt, and brackish water environments in Florida including swamps, estuaries, ponds, lakes, and rivers. Breeding and nesting occur in colonies near freshwater and marine-estuarine habitats. The little blue heron has the potential to occur in riparian habitats of the ROI.

Florida Burrowing Owl. The state-designated threatened Florida burrowing owl occurs in open habitats that generally do not contain trees. The species is found mostly on the ground, using burrows for roosting during winter and for raising young during the breeding season (April/May to July/August). Burrowing owls have been observed on some Eglin test areas, primarily TA B-70. Habitat is incidentally maintained by range maintenance and mowing, prescribed fire and wildfire, and herbicide application.

Migratory Birds. Migratory birds occur in the ROI, although Eglin is not considered an important stopover area or concentration site for neotropical migratory species (birds that winter in the Caribbean and South and Central America and migrate to more temperate regions during summer) in the spring or fall (Tucker et al., 1996). Breeding neotropical migrants at Eglin are primarily found in riparian, hammock, and barrier island areas, which serve as temporary habitat. A total of 39 migratory bird species potentially occurring on Eglin were identified in an EA prepared for activities conducted at certain test areas (DAF, 2017b). The USFWS Information for Planning and Consultation website lists 50 migratory bird species that may potentially occur in the vicinity of Eglin AFB (USFWS, 2024), although some types of birds (e.g., shorebirds and seabirds) would not typically be expected on the test areas or test sites of the ROI.

Invasive Species

Invasive species may compete with and displace native species, degrade habitats, and alter natural processes such as fire or wetlands hydrology. Eglin's Natural Resources Office staff conduct surveys, Geographic Information System mapping, and monitoring of invasive vegetation. The Florida Invasive Species Council has developed a ranking system for invasive nonnative plants based on their degree of impacts on natural areas. Category I species are defined as those species that are altering native plant communities in Florida, while Category II species have increased in abundance or frequency but have not altered native plant communities. A total of 25 Category I species and 12 Category II species have been documented on Eglin AFB (Eglin AFB, 2022). The most problematic of these species are Chinese tallow (popcorn tree) (*Triadica sebifera*), cogon grass (*Imperata cylindrica*), Japanese climbing fern (*Lygodium japonicum*), Chinese privet/hedge (*Ligustrum sinense*), and torpedo grass (*Panicum repens*). Treatment methods for invasive plant species are described in the Eglin AFB INRMP *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and include measures such as hand removal, herbicide application, prescribed fire, and removal of seed-producing plants, among others. Eglin Natural Resources Office staff also conduct control efforts for feral hogs (*Sus scrofa*), feral cats (*Felis cattus*), coyotes (*Canis latrans*), red fox (*Vulpes vulpes*), and numerous nonnative insects. The locations of invasive plants in the ROI, for which geospatial data are available, are shown in Figure 3-4 to Figure 3-6.

3.3.1.1 TA A-73

TA A-73 consists mostly of open grassland/shrubland, which is interspersed with developed sites, exposed soil, and a small area of sandhill habitat. Therefore, the site probably provides limited wildlife habitat value. Developed areas include two fenced compounds, concrete pads, and roads. Adjacent habitats consist of sandhill and pine plantation. Typical wildlife and plant species potentially present in grassland/shrubland and sandhill habitats are listed in Table 3-5.

Sensitive habitats do not occur within the TA A-73 boundary. However, FNAI-designated HQNC and ONA areas occur adjacent to the site and a significant botanical site occurs about 0.25 mile to the south. The test area is nearly surrounded by the Patterson ONA, which is one of the largest areas of old-growth longleaf pine in the southeast.

Federally protected species and ESA-proposed species that potentially occur within or near TA A-73 include the RCW, eastern indigo snake, tricolored bat, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, and southeastern American kestrel. One state-protected plant species, Curtiss' sandgrass (*Calamovilfa curtissii*), has been identified as having potential occurrence on the test area (DAF, 2013a), although comprehensive plant surveys have not been conducted on the Eglin Range and the presence of additional species is presumably possible.

RCW cavity trees do not occur within the TA A-73 boundary, but active and inactive trees are present near the northern, southern, and western boundaries. Migratory birds could potentially be present in areas with suitable habitat, particularly the sandhill and pine plantation habitats adjacent to the test area. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other varied habitats on or near the test area. Tricolored bats could potentially roost and forage in the adjacent pine forest. Monarch butterflies could feed or deposit eggs on suitable plants located on and near the test area, although flowering plants are likely limited on the site because of test area maintenance.

The Florida pine snake and southeastern American kestrel may utilize the sandhill habitat on and around TA A-73. Kestrels could also use the large open grassland/shrubland area for hunting. Invasive plants have been documented on the northern part of the test area.

3.3.1.2 TA A-77

TA A-77 is classified primarily as sandhill but also contains a relatively large total area of exposed soil and less than one acre of wetland habitat. The surrounding area consists mostly of sandhill, with flatwoods and pine plantation located within about 0.25 mile to 0.5 mile to the south and east. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

In addition to the small wetland, other sensitive habitats on TA A-77 consist of a small HQNC area, and a designated ONA that covers the entire test area. HQNC and ONA areas, which contain high-quality stands of old-growth longleaf pine, surround the site.

Federally protected species and ESA-proposed species that potentially occur within or near TA A-77 include the RCW, eastern indigo snake, tricolored bat, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, and southeastern American kestrel. One state-protected plant species, Curtiss' sandgrass (*Calamovilfa curtissii*), has been identified as having potential occurrence on the test area (DAF, 2013a), although the presence of additional plant species is presumably possible.

RCW cavity trees do not occur within the TA A-77 boundary, but active and inactive trees are present near all test area boundaries. Migratory birds could potentially be present in sandhill, flatwoods, wetland, and pine plantation habitats on and adjacent to the test area. The sandhills on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in forested areas, while monarch butterflies could feed or deposit eggs on suitable plants located on and near the test area.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA A-77. Kestrels could also use open, maintained areas for hunting. Invasive plants have been documented on the northern part of the test area.

3.3.1.3 TA A-78

TA A-78 is classified primarily as grassland/shrubland, with a relatively small area of sandhills and less than one acre of wetland habitat. Trees are generally sparsely distributed on the site. The adjacent area is sandhill and grassland/shrubland, with flatwoods and wetlands near the test area to the south. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats on TA A-78 consist of two unnamed streams and a small wetland area, but HQNC areas and the Prairie Creek ONA border the northern, eastern, and western boundaries. The Prairie Creek ONA contains some of the highest-quality sandhills on Eglin, including many old-growth longleaf pines. Additional wetland habitat occurs near the southeastern test area corner.

Federally protected species and ESA-proposed species that potentially occur within or near TA A-78 include the reticulated flatwoods salamander, RCW, eastern indigo snake, tricolored bat, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, and little blue heron. The state-protected southern three-awn grass (*Aristida simpliciflora*), pineland hoary-pea (*Tephrosia mohrii*), and Florida wild indigo (*Baptisia calycosa*) have been identified as having potential occurrence on the test area (DAF, 2013a), although the presence of additional plant species is presumably possible.

Reticulated flatwoods salamander ponds and buffer areas do not occur within the TA A-78 boundary, but buffer areas occur within about 0.25 mile to the northwest and south. RCW cavity trees do not occur on the test area but are located very near the northern, eastern, and western boundaries. Migratory birds could potentially be present in sandhill, flatwoods, and wetland habitats on and near the test area. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage along streams and in forested areas, while monarch butterflies could feed or deposit eggs on suitable plants located on and near the test area.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA A-78. Kestrels could also use the large grassland/shrubland area for hunting. Little blue herons could occur at wetlands on and near the test area. Invasive plants have been documented at numerous areas along the TA A-78 boundary.

3.3.1.4 TA A-79

TA A-79 consists mostly of sandhill habitat, with relatively large areas of wetlands and pine plantation also present. Smaller areas of exposed soil, grassland/shrubland, and open water also occur on the site. TA A-79 no longer supports test or training activities and is more densely forested than most other test areas in the ROI. The adjacent area consists mostly of sandhill interspersed with wetland, pine plantation, and flatwoods habitats. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats on TA A-79 consist of open water (Panther Creek, its tributaries, and a pond), wetlands, floodplains, and HQNC areas. Wetlands and floodplains are associated with Panther Creek and its tributaries. These habitats also occur adjacent to the test area. Additionally, ONAs border the site to the north, northwest, and east. The ONAs contain high-quality stands of old-growth longleaf pine.

Federally protected species and ESA-proposed species that potentially occur within or near TA A-79 include the reticulated flatwoods salamander, RCW, eastern indigo snake, tricolored bat, alligator snapping turtle, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, and little blue heron. The state-protected Curtiss' sandgrass and Florida wild indigo have been identified as having potential occurrence on the test area (DAF, 2013a), although the presence of additional plant species is presumably possible.

A reticulated flatwoods salamander buffer areas intersects the northeast corner of TA A-79, and an additional buffer area occurs less than 0.5 mile to the east. Numerous RCW active and inactive cavity trees occur on and near the test area. Migratory birds could potentially be present in sandhill, flatwoods, pine plantation, and wetland habitats on and near the test area. The sandhills on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in forested areas, while monarch butterflies could feed or deposit eggs on suitable plants located on and near the test area. Alligator snapping turtles may occur in the wetlands on and near TA A-79.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA A-79. Kestrels could also forage in open areas that occur within the pine habitat. Little blue herons could use streams, ponds, wetlands, and floodplains on and near the test area. Invasive plants have been documented at numerous areas along roads within TA A-79.

3.3.1.5 TA A-90

TA A-90 consists of a mix of sandhill and pine plantation habitat. These two habitat types, along with a small wetland area, occur adjacent to the test area. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types. Developed areas are currently not present at the site but are planned in the future. Most of the test area is an HQNC area, and the entire site is an ONA. These sensitive habitats also occur adjacent to the test area. A significant botanical site occurs about one-half mile to the east.

Federally protected species and ESA-proposed species that potentially occur within or near TA A-90 include the reticulated flatwoods salamander, RCW, eastern indigo snake, tricolored bat, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, and southeastern American kestrel. The presence of state-protected plants is unknown but possible on TA A-90.

All of TA A-90 occurs with a reticulated flatwoods salamander pond buffer area, and an additional buffer area occurs less than 0.5 mile to the east. Inactive RCW cavity trees occur along the western test area boundary, and additional active and inactive cavity trees are located less than 0.5 mile to the north, east, and west. Migratory birds could potentially be present in sandhill, pine plantation, and wetland habitats on and near the test area. The sandhills on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in forested areas, while monarch butterflies could feed or deposit eggs on suitable plants located on and near the test area.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA A-90. Kestrels could also forage in open areas that occur within the sandhills matrix. Invasive plants are not known to occur at the site.

3.3.1.6 TA B-7

TA B-7 consists of sandhill habitat interspersed with exposed soil that is mostly associated with targets and roads. Habitat adjacent to the test area is mostly sandhill, with small wetland and hardwood forest areas located north and west of the site. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitats.

Sensitive habitats are not present within the TA B-7 boundary. HQNC areas occur less than 0.5 mile north and south of the test area, and a significant botanical site occurs about 0.3 mile to the south. Bear Creek, Fishtrap Branch (a tributary of Holley Creek), and wetlands and floodplains associated with these streams occur less than 0.25 mile to the north and west, respectively. The headwater slopes of Bear Creek, which are particularly steep, occur in the northern portion of the test area.

Federally protected species and ESA-proposed species that potentially occur within or near TA B-7 include the RCW, eastern indigo snake, tricolored bat, alligator snapping turtle, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, and little blue heron. The state-protected Baltzell’s sedge (*Carex baltzellii*) has been identified as having potential occurrence on the test area (DAF, 2013a), although the presence of additional plant species is presumably possible.

Numerous RCW active and inactive cavity trees are located adjacent to the test area. Migratory birds could potentially be present in sandhill, wetland, and hardwood forest habitats on and near the test area. The sandhills on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage along streams and in forested areas adjacent to the test area, while monarch butterflies could feed or deposit eggs on suitable plants located on and near the site. The alligator snapping turtle may occur in the wetlands and floodplains near TA B-7.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA B-7. Kestrels could forage in open vegetated areas. Little blue herons could use streams, wetlands, and floodplains near the test area. Invasive plants are not known to occur at the site.

3.3.1.7 TA B-12

The largest land category on TA B-12 is urban/landscaped, which is primarily associated with airfield pavement and roads, although some areas between and adjacent to runways contain trees and sparse vegetation. The remainder of the test area consists of pine plantation, sandhill, and open grassland/shrubland habitat. The surrounding area consists of sandhill, pine plantation, and grassland/shrubland. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats do not occur within the TA B-12 boundary. Holley Creek and associated wetlands and floodplains occur about 0.25 mile north of the test area. HQNC areas are adjacent to the southeastern portion of the site and also occur along and north of Holley Creek. A significant botanical site is located about 0.5 mile northwest of the test area.

Federally protected species and ESA-proposed species that potentially occur within or near TA B-12 include the RCW, eastern indigo snake, tricolored bat, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, and southeastern American kestrel. The state-protected Florida wild indigo and Baltzell's sedge have been identified as having potential occurrence on or near the test area (DAF, 2006), although the presence of additional plant species is presumably possible.

RCW cavity trees do not occur on TA B-12 but are located near the northeastern, eastern, southern, and western boundaries. Migratory birds could potentially be present in sandhill and pine plantation habitats on and near the test area. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in plantation and forested areas, while monarch butterflies could feed or deposit eggs on suitable plants located on and near the site.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA B-12. Kestrels could also use grassland/shrubland areas for foraging. Invasive plants are not known to occur on the test area.

3.3.1.8 TA B-70

TA B-70 consists mostly of grassland/shrubland, with a substantial amount of sandhill also present. About 49 acres of wetland habitat occurs on the test area, mostly in the eastern portion. Other habitat types present in relatively small areas include mixed forest, exposed soil, open water, urban/landscaped, and pine plantation. Ecological associations around the test area consist mostly of sandhill and pine plantation, with a moderately large wetland area adjacent to the northeastern boundary. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats occurring within and near TA B-70 consist of FNAI-designated areas, streams, wetlands, and floodplains. HQNCs border many portions of TA B-70 and extend into the southeastern portion of the test area. HQNC is also associated with Live Oak Creek. An ONA occurs adjacent to the western boundary. This ONA contains some of the highest-quality sandhills on Eglin AFB, along with two high-quality steephead streams. Surface waters on the test area consist of Live Oak Creek and Bull Pond. Wetlands occur in association with these water features and also in the easternmost portion of the test area. Floodplains occur adjacent to Live Oak Creek and in several other areas in the eastern half of the site.

Federally protected species and ESA-proposed species that potentially occur within or near TA B-70 include the reticulated flatwoods salamander, RCW, eastern indigo snake, tricolored bat, alligator snapping turtle, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, little blue heron, Florida burrowing owl, and Okaloosa darter. The state-protected Curtiss' sandgrass, pineland hoary-pea, and Florida wild indigo have been identified as having potential occurrence on or near the test area (DAF, 2009), although the presence of additional plant species is presumably possible.

Reticulated flatwoods salamander pond buffers extend into the southwestern portion of TA B-70. An additional pond buffer occurs outside but near the southwestern boundary. Numerous active and inactive RCW cavity trees occur adjacent to the test area boundary. Migratory birds could potentially be present in sandhill, wetland, and pine plantation habitats on and near the test area. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in forested and riparian areas on and near the site, while the alligator snapping turtle could occur in wetland and floodplain areas. Monarch butterflies could feed or deposit eggs on suitable plants in the ROI.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA B-70. Kestrels could also use grassland/shrubland areas for foraging. The little blue heron could potentially occur in riparian, wetland, and floodplain habitat. Burrowing owls have been documented at numerous maintained locations on the test area. An Okaloosa darter stream (Turkey Creek) is located about 1.1 miles from the nearest point of the TA B-70 boundary. Invasive plants occur along Live Oak Creek and a road at the southern test area boundary.

3.3.1.9 TA B-71

Most of TA B-71 consists of grassland/shrubland, with a substantial amount of pine plantation and urban/landscaped land type also present. Relatively small areas of exposed soil and sandhill and wetland habitat also occur. Overall, the site probably provides limited wildlife habitat value. Ecological associations around the test area consist mostly of sandhill and pine plantation, with additional areas of hardwood forest, flatwoods, and wetlands. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats occurring within and near TA B-71 consist of FNAI-designated areas, streams, wetlands, and floodplains. HQNCs occur around much of TA B-71 and extend into the southeastern portion of the test area. Turtle Creek and West Branch occur north and south of the site, respectively. Floodplains associated with Turtle Creek and wetlands associated with both streams extend into the test area for a small distance. Small wetland areas occur near the western part of the asphalt grid. Two unnamed ponds and drainages occur in the northern part of the site but have no associated wetlands or floodplains.

Federally protected species and ESA-proposed species that potentially occur within or near TA B-71 include the reticulated flatwoods salamander, RCW, eastern indigo snake, tricolored bat, alligator snapping turtle, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, little blue heron, Florida burrowing owl, and Okaloosa darter. State-protected plants have not been documented on TA B-71 but are known to occur near the site, including Florida wild indigo, pineland hoary-pea, Baltzell's sedge, Arkansas oak, Panhandle meadowbeauty (*Rhexia salicifolia*), sweet pitcher plant (*Sarracenia rubra*), and spoonleaf sundew (*Drosera intermedia*) (DAF, 2010a), although the presence of additional plant species is presumably possible.

Reticulated flatwoods salamander pond buffers occur near the southern TA B-71 boundary and within 0.5 mile of the northeastern boundary. Active and inactive RCW cavity trees occur near the test area boundary. Migratory birds could potentially be present in sandhill, pine plantation, hardwood forest, flatwoods, and wetland habitats on and near the test area. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in forested and riparian areas on and near the site, while the alligator snapping turtle could occur in wetland and floodplain areas. Monarch butterflies could feed or deposit eggs on suitable plants in the ROI.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA B-71. Kestrels could also use grassland/shrubland areas for foraging. The little blue heron could potentially occur in riparian, wetland, and floodplain habitat. The burrowing owl has been documented on the test area. An Okaloosa darter stream (Turkey Creek) is located about 2 miles from the nearest point of the TA B-71 boundary. Invasive plants are not known to occur at TA B-71.

3.3.1.10 TA B-75

TA B-75 consists mostly of grassland/shrubland, with a relatively large total area of urban/landscaped and sandhill also present. Smaller areas of exposed soil occur in various areas, and a small wetland area is located near the northern boundary. Overall, the site probably provides limited wildlife habitat value. Sandhills comprise most of the area surrounding the site, but relatively small areas of pine plantation, wetland, hardwood forest, and xeric hammock are also present. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats occurring within and near TA B-75 consist of FNAI-designated areas, streams, wetlands, and floodplains. HQNCs occur adjacent to or very near the northern, southern, and western boundaries. A significant botanical site and ONA are located about 0.8 mile west of the test area. An unnamed, seasonal tributary of Wolf Creek with its wetlands and floodplains lies in the northern portion of the site. The slopes of a steephead stream connected to Holley Creek extend into the southern part of the site. Other wetlands and floodplains outside but near TA B-75 are associated with this tributary and with Wolf Creek (north), a tributary of Milligan Creek (northeast), and Holley Creek (south).

Federally protected species and ESA-proposed species that potentially occur within or near TA B-75 include the reticulated flatwoods salamander, RCW, eastern indigo snake, tricolored bat, alligator snapping turtle, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, little blue heron, and Florida burrowing owl. The state-protected Florida wild indigo, pineland hoary-pea, Baltzell's sedge, Curtiss' sandgrass, and Arkansas oak (*Quercus arkansana*) have been documented on or near the test area (DAF, 2010b), although the presence of additional plant species is presumably possible.

A reticulated flatwoods salamander pond buffer extends to nearly the eastern TA B-75 boundary. Numerous active and inactive RCW cavity trees occur adjacent to the test area boundary. Migratory birds could potentially be present in various habitat types on and near the test area, including sandhill pine plantation, wetland, hardwood forest, and hammock. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage in forested and riparian areas on and near the site, while the alligator snapping turtle could occur in wetland and floodplain areas. Monarch butterflies could feed or deposit eggs on suitable plants in the ROI.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA B-75. Kestrels could also use grassland/shrubland and other open areas for foraging. The little blue heron could potentially occur in riparian, wetland, and floodplain habitat. Burrowing owls have been documented on the test area. Invasive plants have been documented at one location on the site.

3.3.1.11 TA B-82

Most of TA B-82 consists of grassland/shrubland, with a moderate amount of exposed soil and small total area of sandhill. Therefore, the site probably provides limited wildlife habitat value. Ecological associations around the test area consist mostly of sandhill and pine plantation, with additional wetlands areas. Typical wildlife and plant species, such as those listed in Table 3-5, are likely present in these habitat types.

Sensitive habitats occurring within and near TA B-82 consist of FNAI-designated areas, streams, wetlands, and floodplains. HQNCs occur around much of TA B-82 and extend into a small portion of the test area. Turtle Creek and associated wetlands border the test area to the east. Floodplains also occur along this stream and extend into TA B-82. Floodplains also occur near the northwestern boundary and within 0.5 mile to the north.

Federally protected species and ESA-proposed species that potentially occur within or near TA B-82 include the RCW, eastern indigo snake, tricolored bat, alligator snapping turtle, monarch butterfly, and migratory birds. State-protected animal species consist of the gopher tortoise, Florida pine snake, southeastern American kestrel, little blue heron, and Okaloosa darter. State-protected plants have not been documented on TA B-82 but Florida wild indigo, pineland hoary-pea, spoonleaf sundew, and sweet pitcher plant are known to occur near the site (DAF, 2010a).

Active and inactive RCW cavity trees occur north-northeast and south-southwest of the TA B-82 boundary. Migratory birds could potentially be present in sandhill, pine plantation, and wetland habitats on and near the test area. The sandhills and open grassland/shrubland on and around the site are potential gopher tortoise habitat. The eastern indigo snake could occur in areas where gopher tortoise burrows are present and in other habitats on or near the test area. Tricolored bats could roost and forage along streams and in forested and riparian areas on and near the site, while the alligator snapping turtle could occur in wetland and floodplain areas. Monarch butterflies could feed or deposit eggs on suitable plants in the ROI.

The Florida pine snake and southeastern American kestrel may utilize sandhill habitat on and around TA B-82. Kestrels could also use grassland/shrubland areas for foraging. The little blue heron could potentially occur in riparian, wetland, and floodplain habitat. An Okaloosa darter stream (Turkey Creek) is located about 2.2 miles from the nearest point of the TA B-82 boundary. Invasive plants are not known to occur at TA B-82.

3.3.1.12 Summary of Potentially Affected Resources

Table 3-7 provides a summary of potentially affected biological resources associated with the applicable test areas.

Table 3-7. Summary of Potentially Affected Biological Resources on or Near Eglin A and B Ranges

Test Area	Vegetation/Ecological Association	Sensitive Habitats	Federally Protected Species				Invasive Species Known	ESA Section 7 Consultation Potentially Required
			Reticulated Flatwoods Salamander	Red-Cockaded Woodpecker	Eastern Indigo Snake	Migratory Birds		
A-73	Grassland/Shrubland: 556 acres Urban/Landscaped: 24 acres Sandhill: 16 acres Exposed Soil: 15 acres Pine Plantation: 0.2 acre	HQNC SBS ONA		x	x	x	Yes	Yes
A-77	Sandhill: 296 acres Exposed Soil: 73 acres Wetlands: 0.5 acre	HQNC[1] ONA[1] Wetland[1]		x	x	x	Yes	Yes
A-78	Grassland/Shrubland: 322 acres Sandhill: 86 acres Wetlands: 0.3 acre	HQNC ONA Stream/Riparian[1] Wetland[1]	x	x	x	x	Yes	Yes
A-79	Sandhill: 618 acres Wetlands: 93 acres Pine Plantation: 51 acres Exposed Soil: 25 acres Grassland/Shrubland: 16 acres Open Water: 1 acre	HQNC[1] ONA Stream/Riparian[1] Wetland[1] Floodplain[1]	x	x	x	x	Yes	Yes
A-90	Sandhill: 12 acres Pine Plantation: 7 acres	HQNC[1] SBS ONA[1]	x	x	x	x	No	Yes
B-7	Sandhill: 305 acres Exposed Soil: 12 acres	HQNC Stream/Riparian Wetland Floodplain		x	x	x	No	Yes
B-12	Urban/Landscaped: 299 acres Pine Plantation: 137 acres Sandhill: 136 acres Grassland/Shrubland: 112 acres	HQNC		x	x	x	Yes	Yes
B-70	Grassland/Shrubland: 9,289 acres Sandhill: 1,384 acres Wetlands: 49 acres Mixed Forest (Wetland and Flatwoods): 31 acres	HQNC[1] ONA Stream/Riparian[1] Wetland[1] Floodplain[1]	x	x	x	x	Yes	Yes

Table 3-7. Summary of Potentially Affected Biological Resources on or Near Eglin A and B Ranges

Test Area	Vegetation/Ecological Association	Sensitive Habitats	Federally Protected Species				Invasive Species Known	ESA Section 7 Consultation Potentially Required
			Reticulated Flatwoods Salamander	Red-Cockaded Woodpecker	Eastern Indigo Snake	Migratory Birds		
	Exposed Soil: 15 acres Open Water: 12 acres Urban/Landscaped: 3 acres Pine Plantation: 1 acre							
B-71	Grassland/Shrubland: 1,616 acres Pine Plantation: 442 acres Urban/Landscaped: 224 acres Sandhill: 15 acres Wetlands: 3 acres Exposed Soil: 0.2 acre	HQNC[1] Stream/Riparian[1] Wetland[1] Floodplain[1]	x	x	x	x	No	Yes
B-75	Grassland/Shrubland: 3,395 Urban/Landscaped: 80 acres Sandhill: 79 acres Exposed Soil: 33 acres Wetlands: 8 acres	HQNC SBS ONA Stream/Riparian[1] Wetland[1] Floodplain[1]	x	x	x	x	Yes	Yes
B-82	Grassland/Shrubland: 1,267 acres Exposed Soil: 156 acres Sandhill: 14 acres	HQNC[1] Stream/Riparian Wetland Floodplain[1]		x	x	x	No	Yes

ESA = Endangered Species Act; HQNC = High Quality Natural Community; ONA = Outstanding Natural Area; SBS = significant botanical site
Note:
1. Resource occurs within the test area boundary.

3.3.2 Environmental Consequences

This section provides an assessment of potential impacts on biological resources that could result from the proposed alternatives. Impacts are evaluated according to type, context, intensity, and duration, as well as regulatory requirements and the management practices identified in Section 3.3.2.4 (Management Actions). Together, these attributes define the potential significance of the impacts. Impacts may be direct, indirect, or, if combined with other actions, cumulative.

The level of impact associated with biological resources and the impact's potential significance is determined by considering how Proposed Action effectors could interact with biological resources in terms of context, intensity, and duration.

Context for biological resources may be:

- Localized, with impacts to individuals; or
- Regional, with population-level impacts.

Intensity can be either adverse or beneficial, and may be:

- Neutral, with no perceptible change in the resource category
- Low, with no management requirements needed, and unavoidable adverse impacts recoverable through natural processes
- Medium, with potential need for management requirements to avoid adverse impacts, and unavoidable adverse impacts likely recoverable with BMPs and management requirements
- High, with management requirements necessary to minimize or avoid adverse impacts, and unavoidable adverse effects that may not be recoverable

Duration may be:

- Short term, with an effect that would likely last for a few days to weeks
- Medium term, with an effect that would likely last for a few months to a year
- Long term, with an effect that would likely endure for the life of the action

Table 3-8 identifies the potential for significant impacts to biological resources for various combinations of context, intensity, and duration.

Table 3-8. Significance Determination Matrix

Significance Potential	Context, Intensity, and Duration Combinations and Effects
No adverse impacts or negligible adverse impacts	Neutral or low intensity, local or regional context, of any duration • No or minor effects on vegetation communities or ecological associations • No effects on the health or size of sensitive habitats • No or minor potential for mortality, injury, or harassment of wildlife, including protected species • Eradication or decline of an invasive species; no or minor potential to introduce or spread invasive species
Impacts are adverse but insignificant	Medium intensity, local or regional context, of any duration • Potential for moderate effects on vegetation communities or ecological associations; preventable or recoverable with management practices • Minor effects on sensitive habitats; preventable or recoverable with management practices

Table 3-8. Significance Determination Matrix

Significance Potential	Context, Intensity, and Duration Combinations and Effects
	• Potential for mortality, injury, or harassment of wildlife; effects not detectable at the population level • Potential for take of protected species by mortality, injury, or harassment; impacts can be minimized or avoided with management practices; take permits may be obtained • Potential for introduction or spread of invasive species; can likely be prevented with management practices
Impacts are adverse and potentially significant	High intensity, local or regional context, of any duration • Substantial effects on vegetation communities or ecological associations; likely to result in population or health decline of plants or animals • Substantive, measurable degradation of sensitive habitats; likely to result in population or health decline of plants or animals • Potential for mortality, injury, or harassment of wildlife; effects detectable at the population level • Potential for take of protected species by mortality, injury, or harassment, at a level that may cause jeopardy consideration or more stringent terms and conditions (federally listed species) • Potential for large areas of new invasive species that cannot be controlled without long-term intervention • Impacts may be reduced to "insignificant" through management requirements or separation of effects and receptors

Impact assessment considers implementation of management practices to avoid or minimize potentially adverse impacts. Potential impacts to biological resources are considered in the context of impact categories, which consist of direct strikes, habitat alteration, noise and other harassment, and introduction or spread of invasive species. Brief summaries of these impact categories are provided below; detailed descriptions are provided in Appendix A (Eglin A and B Ranges Biological Resources). Discussion of impact categories in the context of individual test areas and test sites is provided in the No Action Alternative and Alternative 1 subsections. Table 3-9, Table 3-10, and Table 3-11 show the potential impacts for the No Action Alternative and Alternative 1.

Direct Strike

Direct strike refers to a physical strike or other direct impact on an organism resulting from testing, training, or maintenance activities. Direct strike impacts to wildlife and vegetation could result from expendables (e.g., ordnance, small arms ammunition, medium- and large-caliber rounds, explosives, and pyrotechnics), foot traffic (trampling), operation of vehicles or other equipment (crushing or direct strike), direct exposure to fires, and exposure to electromagnetic radiation (EMR) (e.g., lasers and radar).

Habitat Alteration

Habitat alterations are described as physical damage or disruptions that may alter or degrade terrestrial or aquatic habitats. A habitat refers to the ecologic (i.e., the relationship between living organisms and their environment) and geomorphologic (i.e., the origin and development of landforms) components that support organisms, such as vegetation, soil, topography, and water. Degradation of unique and diverse habitats may impact sensitive species. Examples of habitat alteration include damage or destruction of vegetation; soil erosion; sedimentation of aquatic habitats; wildfires; deposition or dispersal of materials such as metals, explosives, explosives by-products, obscurant smoke, petroleum-based products, and herbicides and other substances onto the ground, into water resources, or into the air; and habitat fragmentation. Habitat alteration can contribute to displacement, stress, injury, or mortality to the plants and animals that are supported by those habitats.

Noise and Other Disturbance

Wildlife may be impacted by noise and general disturbance resulting from testing, training, and maintenance activities. Visual or auditory detection of human presence and general activity may startle or disturb wildlife, potentially resulting in stress or behavioral reactions such as avoiding or fleeing an affected area. Individuals could retreat to shelter, or temporarily leave an area of high activity level. These reactions could interrupt other activities (feeding, resting, etc.) and would require energy expenditure. In addition to effects due to human presence and general disturbance, wildlife may be impacted by noise resulting from use of items such as small arms blanks and live rounds, air-to-surface gunnery rounds, and C-4 explosive, as well as detonation of energetics in various other expendables such as bombs and pyrotechnics. Potential stress and behavioral reactions would be similar to those described above for general disturbance, but could be more pronounced due to the loudness and impulsive nature of the noise. In addition, detonation noise may potentially cause hearing impairment.

Invasive Species

Invasive species may compete with and possibly displace native species. They may also degrade protected species habitat and alter natural processes such as fire or wetland hydrology. Invasive species may colonize recently disturbed areas, and therefore, ground movements and other ground-disturbing activities may allow such species to spread. Wildfire may create conditions favorable to invasive species, which may colonize burned areas and become established before native vegetation. Conversely, invasive species that are not fire-tolerant may be killed in wildfires, thereby benefitting the health of native ecosystems. Prescribed fires generally help to control invasive plants. Seeds and rhizomes of invasive species may be accidentally transported to new areas by vehicles, bush hogging equipment, or other equipment, and may be present in fill and landscaping materials. To reduce the potential for spreading invasive species, military vehicles and equipment would be cleaned before and after use in accordance with Armed Forces Pest Management Board Technical Guide Number (No.) 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

3.3.2.1 No Action Alternative

3.3.2.1.1 TA A-73

Testing and Training

Direct Strike

Small arms and simulated munitions, “simunitions,” were previously used at TA A-73, but these items are no longer used at the site. Under the No Action Alternative, vehicle strikes would be possible but very unlikely because operators would typically be able to see and avoid wildlife, and because vehicles are primarily kept on established roads. In addition, general disturbance associated with setup of testing and training events could cause animals to leave an affected area, further reducing the potential for strikes. Limited off-road vehicle operation would also decrease the potential to impact the state-protected Curtiss' sandgrass.

As discussed in Appendix A (Eglin A and B Ranges Biological Resources), radar sites are located in developed/maintained areas that provide little quality wildlife habitat, are higher than the tree lines of adjacent forested areas, and have safety features to prevent radar beams from accidentally contacting vegetation, animals on the ground, and tree-dwelling animals and nests. Due to the rapid decrease of radiation levels with distance, ground- and tree-dwelling wildlife would not likely be exposed to radiation levels associated with adverse effects. Birds, bats, and insects, including protected species, may potentially fly through the path of a radar beam. Due to the volume of space occupied by a radar beam, the probability of an animal flying within a hazard area is low. The potential for prolonged exposure is extremely low due to the movement of the animal. If an animal flies or hovers directly within the path of a beam close to the source, thermal stress would likely trigger it to fly in another direction, and any associated impact would be short term.

Habitat Alteration

Small arms testing and training, as well as plastic explosives use, would only occur in a containment area constructed for these activities (DAF, 2013a). Therefore, there would be minimal ground disturbance and associated potential to cause erosion on the test area overall. Based on the lack of use to date, deposit of metal and chemical constituents at levels that would adversely affect wildlife would not be expected. Vehicles would primarily be operated on established roads, and ground disturbance from personnel would be negligible.

Noise and Other Disturbance

Impulsive noise would potentially be produced on TA A-73 by small arms fire and use of plastic explosives. Wildlife, including protected species, on and adjacent to the test area could react to the noise (e.g., stress and temporary behavioral responses). Hearing damage could also occur in animals very near the source. The containment area consists mostly of cleared and grassland/shrubland areas, which is generally not considered high-quality habitat. However, species such as the gopher tortoise, eastern indigo snake, tricolored bat, monarch butterfly, Florida pine snake, southeastern American kestrel, and migratory birds could transit the site or occur nearby. RCW cavity trees are present near the test area boundary. Based on the lack of activities to date, small arms and explosives use would probably be infrequent. There would likely be no detectable effects on populations of any species. In general, many wildlife species on Eglin seem to be tolerant of noise associated with military missions. Non-impulsive noise and general disturbance associated with vehicles and human presence would cause negligible impacts on wildlife overall.

Invasive Species

Invasive plant species have been documented on TA A-73. Ground-disturbing activities may potentially facilitate the spread of invasive vegetation, although substantial ground disturbance would not be expected. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and*

Nuisance Native Wildlife (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA A-73.

Range Clearance and Maintenance

Wildlife, including protected species, could potentially be affected by range clearance and maintenance activities. Individuals could be physically impacted during mowing/bush hogging and by vehicles or other equipment during activities such as debris removal and road maintenance. Many animals would likely be aware of such activities and would move from the affected area before being struck. Similarly, many individuals would likely move away from affected areas during herbicide application, which would decrease the potential for direct impacts from equipment and direct herbicide exposure. Injury or mortality could potentially occur from prescribed fires originating on other test areas, as activities on TA A-73 would be unlikely to start fires. In general, physical impacts would be more likely for small and less mobile species. Range personnel would be required to avoid direct impacts to wildlife and would also be instructed to avoid direct impacts to gopher tortoise burrows.

Noise and general disturbance that causes wildlife to leave or avoid an area would potentially result in stress and disruption of important life functions (e.g., feeding, nesting). Such impacts would generally be intermittent and short term in duration.

Prescribed fire, herbicide application, tree removal, and mowing/bush hogging would represent ongoing habitat alteration. Continued maintenance would prevent transition of open grasslands/shrublands habitat to pre-disturbance habitats (sandhill or other associations). Fire and herbicide use would involve vegetation removal and associated loss of shelter, forage, and prey resources, but the effects would be temporary. Some maintenance activities would disturb the soil, which could result in erosion-related impacts to wetlands and surface waters. However, substantial erosion issues are not currently known on TA A-73. The potential for impacts resulting from accidental spills of gasoline, oil, and other petroleum-based products is considered low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB Spill Prevention, Control, and Countermeasure (SPCC) Plan. The potential for introducing or spreading invasive plant species would be reduced by implementing requirements and management practices in the Eglin AFB INRMP *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021), as applicable. Herbicide use would occur in accordance with requirements contained in the *Final Environmental Assessment, Long-Term Vegetation Control for Eglin Air Force Base, Florida* (DAF, 2008a) and associated Biological Assessment (DAF, 2007b).

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts on biological resources would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources, including protected species, would not be expected because of range clearance and maintenance activities on TA A-73.

3.3.2.1.2 TA A-77

Testing and Training

Direct Strike

Wildlife could be physically struck by numerous effectors during testing and training activities on TA A-77, including bombs, missiles, rockets, shrapnel, explosive shock waves, small arms rounds, explosives, personnel, vehicles, and other equipment. Overall, the potential for wildlife to be physically struck would be low. Most bombs, missiles, and other munitions strike their targets or fall close to the targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. The potential for troops to trample wildlife or for vehicles to strike wildlife would be low and there would be no population-level effects. Impacts on state-protected plant species would be possible but effects on overall distribution would not be expected, as few plants have been observed on the test area. Ground activities are typically conducted on established roads, and vehicles must remain on roads without prior approval. Off-road troop movements are of low frequency and intensity.

Based on historical data Appendix A (Eglin A and B Ranges Biological Resources) and the tempo of testing and training activities on TA A-77, the potential for wildfires would be high. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees and trees potentially used by tricolored bats, kestrels, and migratory birds are present near the test area. Eastern indigo snakes, monarch butterflies, gopher tortoises, and Florida pine snakes could also transit the test area. While it is conceivable that a protected species could be physically struck by ordnance, personnel, or vehicles, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations, troop maneuvers, and vehicle operation could impact gopher tortoise burrows. Typically, tortoises would be able to dig out of the sandy test area soils if a burrow entrance collapsed. There is the potential for commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows to be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with Florida Fish and Wildlife Conservation Commission (FWC) protocols. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Numerous activities on TA A-77 involve ground disturbance, which can cause or intensify existing erosion. Ground disturbance caused by bombs, missiles, other munitions, and pyrotechnics can result in soil displacement. Troop movement, vehicle operation, and helicopter rotorwash can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated areas that occur on and near the complex, including HQNC and ONA. Aerial imagery indicates the occurrence of moderate erosion at the air-to-ground impact area and other target areas, but significant erosion issues are not known. Disturbed areas are not located near streams or wetlands.

Expenditure of some items would result in deposition of metals, explosives, explosives by-products, and other materials such as smoke components on TA A-77. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of constituents in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial off-site erosional transport of metals and chemical constituents would not be likely. Chaff and flares would not adversely affect soils on or near the test area. The potential for impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the alligator snapping turtle or little blue heron. Gopher tortoise burrows could be crushed or damaged by air-to-ground and ground-to-ground ordnance, troop maneuvers, and vehicles (particularly tracked vehicles), affecting tortoises and other commensal species such as the indigo snake and pine snake. The probability of ordnance landing close enough to a burrow to cause damage or collapse is considered low because only burrows near targets would typically have the potential to be affected. Vehicles are primarily operated on established roads, which decreases the potential for impacts. Damage due to troop movement on foot is unlikely to be frequent or substantial. Troops would be able to see and avoid burrows in some cases, and any impacts would be less severe than those caused by ordnance or vehicles. In addition, off-road troop movement is relatively low in frequency and intensity. Prior to missions involving extensive off-road activities in the vicinity of gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises and burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis) and survey prior to construction.

Fire is generally beneficial to the longleaf, open grassland, and flatwood communities on Eglin AFB and associated species, RCWs, and gopher tortoises. However, wildfires of high intensity may damage or destroy RCW cavity trees. Catastrophic wildfire is the greatest source of tree mortality in old-growth longleaf pine forest such as the area north of the test area. Firefighting actions are restricted at TA A-77 due to the increased potential for UXO, which reduces the ability of firefighters to protect RCW cavity trees (DAF, 2013a). Firefighting activities in such no-suppression areas is typically limited to block and burn techniques. As a result of previous consultation under Section 7 of the ESA, Eglin's Natural Resources Office prioritizes most no-suppression areas for annual prescribed burning. Conditions of the consultation include a specified burn interval, cavity tree preparation prior to burning, and replacing cavity trees damaged by fire with an artificial cavity. These actions substantially reduce the potential for impacts on RCW cavity trees as well as other protected species.

Noise and Other Disturbance

Impulsive noise would be produced on TA A-77 by airborne gunnery, the impact of gunnery rounds, bombs, missiles, rockets, explosives, and small arms fire. Wildlife on and adjacent to the test area, including protected species, could hear and react to the sounds (e.g., stress and temporary behavioral reactions). Hearing damage could also occur in animals near a loud, impulsive noise source. Some activities may produce noise levels above 140 decibels (dB), which is considered the threshold at which damage to human hearing can occur and has been used as the level above which physical injury may potentially occur in wildlife as well. Previous analysis concluded that under the worst-case scenario of 25-pound rockets fired at targets closest to RCW trees on TA A-77 and A-78, a total combined 22 RCW cavity trees would be exposed to this noise level (DAF, 2013a). RCW population effects have not been observed on Eglin AFB near test areas supporting gunnery operations versus areas without gunnery operations. RCWs on Eglin AFB have demonstrated adaptability to noise and probably have become habituated to munitions noise at least to some extent, and continue to nest successfully in close proximity to the test areas. Although other suitable habitat is available on Eglin, RCWs have continued to nest and forage at and near TA A-77. Quality habitat appears to outweigh any negative influences associated with munitions noise. Based on continued occurrence, it is plausible that other wildlife on or near the test area, including protected species, are also tolerant of the noise. Although a startle response or other effect would be likely in wildlife, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance would be caused by activities including ground maneuvers and vehicle operation. Disturbance from ground-based activities would likely be greatest during activities at the training villages. However, overall, noise and disturbance levels would be low compared to munitions use, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced on the test area, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area temporarily or long term. In some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have been documented on and adjacent to portions of TA A-77. Ground-disturbing activities may potentially facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA A-77.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA A-77.

3.3.2.1.3 TA A-78

Testing and Training

Direct Strike

Wildlife could be physically struck by numerous effectors during testing and training activities on TA A-78, including bombs, missiles, rockets, shrapnel, explosive shock waves, small arms rounds, explosives, personnel, vehicles, and other equipment. As discussed for TA A-77, the overall potential for wildlife to be physically struck would be low. Most bombs, missiles, and other munitions strike their targets or fall close to the targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. The potential for troops to trample wildlife or for vehicles to strike wildlife would be low and there would be no population-level effects. Impacts on state-protected plant species would be possible but effects on overall distribution would not be expected, as few plants have been observed on the test area.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) and the tempo of testing and training activities on TA A-78, the potential for wildfires would be high. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees are present near the test area, and trees potentially used by tricolored bats, kestrels, and migratory birds are present on and near the test area. Eastern indigo snakes, monarch butterflies, gopher tortoises, and Florida pine snakes could also transit the test area. As discussed for TA A-77, while it is conceivable that a protected species could be physically struck by ordnance, personnel, or vehicles, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations, troop maneuvers, and vehicle operation could impact gopher tortoise burrows. Typically, tortoises would be able to dig out of collapsed burrows. There is potential for commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows to be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. If necessary, tortoises would be relocated in accordance with FWC protocols. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Numerous activities on TA A-78 involve ground disturbance, which can cause or intensify existing erosion. Ground disturbance caused by bombs, missiles, other munitions, and pyrotechnics can result in soil displacement. Troop movement, vehicle operation, and helicopter rotorwash can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated areas that occur on and near the complex, including HQNC and ONA. Some disturbed areas, such as the clay-surfaced HLZ and target areas, are located near the two stream channels identified by geospatial data. However, aerial imagery does not indicate the occurrence of substantial erosion at the test area.

Expenditure of some items would result in deposition of metals, explosives, explosives by-products, and other materials such as smoke components on TA A-78. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of constituents in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial off-site erosional transport of metals and chemical constituents would not be likely. Chaff and flares would not adversely affect soils on or near the test area. The potential for impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the reticulated flatwoods salamander, alligator snapping turtle, or little blue heron. Eglin restricts the release of chemicals or metals within a 1,500-foot buffer around flatwoods salamander habitat. Gopher tortoise burrows could be crushed or damaged by air-to-ground and ground-to-ground ordnance, troop maneuvers, and vehicles, affecting tortoises and other commensal species such as the indigo snake and pine snake. The probability of ordnance landing close enough to a burrow to cause damage or collapse is considered low because only burrows near targets would typically have the potential to be affected. Vehicles are primarily operated on established roads, which decreases the potential for impacts. Damage due to troop movement on foot is unlikely to be frequent or substantial. Troops would be able to see and avoid burrows in some cases, and any impacts would be less severe than those caused by ordnance or vehicles. In addition, off-road troop movement is relatively low in frequency and intensity on most portions of the test area. Prior to missions involving extensive off-road activities in the vicinity of gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises and burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis) and survey prior to construction.

Fire is generally beneficial to the longleaf, open grassland, and flatwood communities on Eglin AFB and associated species, RCWs and gopher tortoises. However, wildfires of high intensity may damage or destroy RCW cavity trees. Catastrophic wildfire is the greatest source of tree mortality in old-growth longleaf pine forest such as the area north of the test area. Firefighting actions are restricted at TA A-78 due to the increased potential for UXO, which reduces the ability of firefighters to protect RCW cavity trees (DAF, 2013a). Firefighting activities in such no-suppression areas is typically limited to block and burn techniques. As a result of previous consultation under Section 7 of the ESA, Eglin's Natural Resources Office prioritizes most no-suppression areas for annual prescribed burning. Conditions of the consultation include a specified burn interval, cavity tree preparation prior to burning, and replacing cavity trees damaged by fire with an artificial cavity. These actions substantially reduce the potential for impacts on RCW cavity trees as well as other protected species.

Noise and Other Disturbance

Impulsive noise would be produced on TA A-78 by airborne gunnery, the impact of gunnery rounds, bombs, missiles, rockets, explosives, and small arms fire. Wildlife on and adjacent to the test area, including protected species, could hear and react to the sounds (e.g., stress and temporary behavioral reactions). Hearing damage could also occur in animals near a loud, impulsive noise source. Some activities may produce noise levels above 140 dB, which is considered the threshold at which damage to human hearing can occur and has been used as the level above which physical injury may potentially occur in wildlife as well. Previous analysis concluded that under the worst-case scenario of 25-pound rockets fired at targets closest to RCW trees on TA A-77 and A-78, a total combined 22 RCW cavity trees would be exposed to this noise level (DAF, 2013a). RCW population effects have not been observed on Eglin AFB near test areas supporting gunnery operations versus areas without gunnery operations. RCWs on Eglin AFB have demonstrated adaptability to noise and probably have become habituated to munitions noise at least to some extent, and continue to nest successfully near the test areas. Although other suitable habitat is available on Eglin, RCWs have continued to nest and forage at and near TA A-78. Quality habitat appears to outweigh any negative influences associated with munitions noise. Based on continued occurrence, it is plausible that other wildlife on or near the test area, including protected species, are also tolerant of the noise. Although a startle response or other effect would be likely in wildlife, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance would be caused by activities including ground maneuvers and vehicle operation. Disturbance from ground-based activities would likely be greatest during activities at the simulated village and small arms firing area. However, overall, noise and disturbance levels would be low compared to munitions use, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise and disturbance on the test area, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area temporarily or long term. In some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have been documented at numerous locations along the boundary of TA A-78. Ground-disturbing activities may potentially facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA A-78.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA A-78.

3.3.2.1.4 TA A-79

Under the No Action Alternative, mission activities would not be conducted at TA A-79 and there would be no impacts on biological resources from training or testing activities. Potential impacts would be limited to erosion at the clay/sand borrow pit, wildfires started on other test areas, and range clearance and maintenance activities. Aerial imagery indicates a small amount of erosion at the borrow pit, but there does not appear to be substantial movement of sediments offsite or toward Panther Creek or associated wetlands and floodplains. Vehicles used for transport of soil from the borrow pit would remain on roads or within the pit area and would be unlikely to strike or disturb wildlife. Firefighting actions are restricted at TA A-79 due to the increased potential for UXO (DAF, 2013a). As a result of previous consultation under Section 7 of the ESA, Eglin's Natural Resources Office prioritizes most no-suppression areas for annual prescribed burning. Conditions of the consultation include a specified burn interval, cavity tree preparation prior to burning, and replacing cavity trees damaged by fire with an artificial cavity. These actions substantially reduce the potential for impacts on wildlife, including protected species.

Range clearance and maintenance activities are limited on the test area, and potential impacts would be similar to those described for TA A-73. Direct strikes by vehicles or equipment would be unlikely. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA A-79.

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA A-79.

3.3.2.1.5 TA A-90

Testing and Training

Direct Strike

Wildlife could be physically struck by bullets associated with small arms fire, vehicles, and personnel. Although expenditures are not identified for the test area in Table 2-2, up to 500,000 rounds per year were evaluated previously (USACE, 2019). Overall, the potential for wildlife, including protected species, to be physically struck would be low. The cleared, lightly vegetated maneuver area probably supports limited wildlife occurrence. The probability of an animal occurring in the path of a bullet would be low. Most bullets would strike their targets or impact the berms close to the targets. General disturbance could cause animals to leave the maneuver area before firing began. The potential for troops to trample wildlife or for vehicles to strike wildlife would be low and there would be no population-level effects. Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) and the type of training activities on TA A-90, the potential for wildfires would be low. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would further reduce the potential for physical impacts.

Avoidance of active gopher tortoise burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

It is expected that ground disturbance from vehicles and personnel maneuvers would be limited to the designated maneuver area and that the potential for transport of sediments to aquatic habitats and FNAI-designated areas would be very low. Expenditure of small arms rounds some items would result in deposition of metals, explosives, and explosives by-products on TA A-90. As described in (Appendix A, Eglin A and B Ranges Biological Resources), accumulation of constituents in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at heavily used locations (e.g., targets and berms) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial off-site erosional transport of metals and chemical constituents would not be likely. The potential for impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the flatwoods salamander, alligator snapping turtle, or little blue heron. Gopher tortoise burrows could be crushed or damaged by troop maneuvers and vehicles, but it is unlikely that tortoises would construct burrows within the regularly used maneuver area. Troops would be instructed to avoid gopher tortoises and burrows, and not to dig within 25 feet of any burrow.

Noise and Other Disturbance

Impulsive noise would be produced on TA A-90 during small arms fire. Wildlife on and adjacent to the test area, including protected species, could hear and react to the sounds (e.g., stress and temporary behavioral reactions). Hearing damage could also occur in animals near a loud, impulsive noise source. RCW cavity trees are present near the test area. RCWs on Eglin AFB have demonstrated adaptability to noise and probably have become habituated to munitions noise to some extent, and continue to nest successfully in close proximity to the test areas. Quality habitat appears to outweigh any negative influences associated with munitions noise. Based on continued occurrence, it is plausible that other wildlife on or near the test area, including protected species, are also tolerant of the noise. Although a startle response or other effect would be likely in wildlife, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance would be caused by activities including ground maneuvers and vehicle operation. However, overall, noise and disturbance levels would be low compared to munitions use, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced on the test area, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area temporarily or long term. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have not been documented on or near TA A-90. Ground-disturbing activities may potentially introduce invasive vegetation. Activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA A-90.

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA A-90.

3.3.2.1.6 TA B-7

Testing and Training

Direct Strike

Wildlife could be physically struck by numerous effectors during testing and training activities on TA B-7, including bombs, rockets, missiles, and various large, medium, and small-cartridge rounds. Overall, the potential for wildlife to be physically struck would be low. Bombs and other ordnance are directed at targets and generally strike or fall close to the targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. The potential for troops to trample wildlife or for vehicles to strike wildlife would be low and there would be no population-level effects. Impacts on state-protected plant species would be possible but effects on overall distribution would not be expected, as few plants have been observed on the test area.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) and the tempo of activities on TA B-7, the potential for wildfires would be high. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees and trees potentially used by tricolored bats, kestrels, and migratory birds are present near the test area. Eastern indigo snakes, monarch butterflies, gopher tortoises, and Florida pine snakes could also transit the test area. While it is conceivable that a protected species could be physically struck by ordnance, personnel, or vehicles, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations and vehicle operation could impact gopher tortoise burrows. Typically, tortoises would be able to dig out of collapsed burrows. Commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows could be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Ground disturbance caused by ordnance would result in soil displacement, which can cause or intensify existing erosion. Vehicle operation can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated areas that occur near the complex, including HQNC and a significant botanical site. Ground disturbance is evident throughout much of the test area, but significant erosion issues are not known.

Expended items would cause deposition of metals, explosives, and explosives by-products on TA B-7. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of constituents in soils of the test area and surrounding area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at heavily used target areas could be substantially greater. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial off-site erosional transport of metals and chemical constituents would not be likely. The potential for impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the alligator snapping turtle or little blue heron. Gopher tortoise burrows could be crushed or damaged by ordnance and vehicles, affecting tortoises and other commensal species such as the indigo snake and pine snake. The probability of ordnance landing close enough to a burrow to cause damage or collapse is considered low because only burrows near targets would typically have the potential to be affected. Personnel would be instructed to avoid gopher tortoises and burrows.

Fire is generally beneficial to the ecological associations and associated species on Eglin AFB. However, wildfires of high intensity may damage or destroy RCW cavity trees. Catastrophic wildfire is the greatest source of tree mortality in old-growth longleaf pine forest. Firefighting actions are restricted at TA B-7 due to the increased potential for UXO, which reduces the ability of firefighters to protect RCW cavity trees (DAF, 2013a). Firefighting activities in such no-suppression areas is typically limited to block and burn techniques. As a result of previous consultation under Section 7 of the ESA, Eglin's Natural Resources Office prioritizes most no-suppression areas for annual prescribed burning. Conditions of the consultation include a specified burn interval, cavity tree preparation prior to burning, and replacing cavity trees damaged by fire with an artificial cavity. These actions substantially reduce the potential for impacts on RCW cavity trees as well as other protected species.

Noise and Other Disturbance

Impulsive noise would be produced on TA B-7 by airborne gunnery, the impact of gunnery rounds, bombs, missiles, and rockets. Wildlife on and adjacent to the test area, including protected species, could hear and react to the sounds. Hearing damage could also occur in animals near a loud, impulsive noise source. Previous analysis of the largest ordnance used (7-pound gunnery charges), assuming they were used at targets nearest RCW trees, concluded that five RCW cavity trees could be exposed to 140 dB at peak pressure (dBP) noise levels (DAF, 2013a), although it is noted that RCW occurrence in a particular area may shift over time. Use of 7-pound gunnery is frequent on the test area and the noise it produces is repetitious. Based on damage to human hearing, it is assumed that continuous noise at this level may injure the ears of exposed RCWs. RCW population effects have not been observed on Eglin AFB near test areas where loud, frequent impulsive noise is produced. RCWs on the installation have demonstrated adaptability to noise and probably have become habituated to munitions noise at least to some extent, and continue to nest successfully in close proximity to the test areas. Although other suitable habitat is available on Eglin, RCWs have continued to nest and forage at and near TA B-7. Quality habitat appears to outweigh negative influences associated with munitions noise. In contrast to humans, birds can regenerate hair cells even after considerable losses, indicating that birds may be more resilient from hearing damage than humans (Bowles, 1995). Based on continued occurrence, it is plausible that other wildlife on or near the test area, including protected species, are also tolerant of the noise. Although a startle response or other effect would be likely in wildlife, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance would be caused by activities including vehicle operation and personnel activities. However, such disturbance and noise levels would be low compared to ordnance use, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced on the test area, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area temporarily or long term. In some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have not been documented on or adjacent to TA B-7. Ground-disturbing activities may potentially introduce invasive vegetation. Wildfires may have either beneficial or adverse impacts with regard to invasive species. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest

Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of high intensity (7-pound gunnery charges). With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA B-7.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA B-7.

3.3.2.1.7 TA B-12

Testing and Training

Direct Strike

Wildlife could be physically struck by numerous effectors during testing and training activities on TA B-12, including air-to-ground small arms rounds, grenades, unmanned aerial systems, explosive shock waves, vehicles, and troops. Overall, the potential for wildlife to be physically struck would be low. Munitions are directed toward targets and most strike or fall close to the targets. Areas where munitions and other items such as simulators and detonators are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. The potential for troops to trample wildlife or for vehicles to strike wildlife would be low and there would be no population-level effects. Impacts on state-protected plant species would be possible but effects on overall distribution would not be expected, as few plants have been observed on the test area. Ground activities are typically conducted on established roads, and vehicles must remain on roads without prior approval. It would be possible for a bird, bat, or insect to collide with an unmanned aerial system, but the probability would be low.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) the potential for wildfires on TA B-12 would be low. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* would (DAF, 2013b) reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees are present near the test area, and trees potentially used by tricolored bats, kestrels, and migratory birds are present on and near the test area. Eastern indigo snakes, monarch butterflies, gopher tortoises, and Florida pine snakes could also transit the test area. While it is conceivable that a protected species could be physically struck by ordnance, personnel, or vehicles, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations, troop maneuvers, and vehicle operation could impact gopher tortoise burrows. Typically, tortoises would be able to dig out of a collapsed burrow. Commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows could be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Numerous activities on TA B-12 involve ground disturbance, which can cause or intensify existing erosion. Ground disturbance caused by munitions, pyrotechnics, troop movement, and vehicle operation can result in soil displacement. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated areas that occur on and near the complex, including HQNC and a significant botanical site. Significant erosion issues are not known on the test area. Disturbed areas are not located near streams or wetlands.

Expenditure of some items would result in deposition of metals, explosives, explosives by-products, and other materials such as chemical/biological agent simulants on TA B-12. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of metals and explosives in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. The concentrations of simulants deposited onto the ground and migrating to groundwater is unknown but are presumably below levels that would adversely affect wildlife populations. Substantial off-site erosional transport of metals and chemical materials would not be likely. The potential for impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the alligator snapping turtle or little blue heron. Gopher tortoise burrows could be crushed or damaged by ordnance, troop maneuvers, and vehicles, affecting tortoises and other commensal species such as the indigo snake and pine snake. The probability of ordnance landing close enough to a burrow to cause damage or collapse is considered low because only burrows near targets would typically have the potential to be affected. Vehicles are primarily operated on established roads, which decreases the potential for impacts. Damage due to troop movement on foot is unlikely to be frequent or substantial. Troops would be able to see and avoid burrows in some cases, and any impacts would be less severe than those caused by ordnance or vehicles. In addition, off-road troop movement is relatively low in frequency and intensity. Prior to missions involving extensive off-road activities in the vicinity of gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises and burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis) and survey prior to construction.

Noise and Other Disturbance

Impulsive noise would be produced on TA B-12 by airborne gunnery, the impact of gunnery rounds, grenades, simulants, and other explosives. Impulse noise from these sources has the potential to affect the behavior, reproduction, and hearing ability of wildlife on and adjacent to the test area, including protected species. Target areas and other frequently impacted areas are generally not considered high-quality habitat, reducing the number of animals potentially affected. Although wildlife would be impacted by impulse noise, detectable effects at the population level would not be expected. RCWs and other protected species seem to be tolerant of noise produced on the test area to some degree, indicating that quality habitat outweighs adverse noise-related effects for at least some species. For example, although other suitable habitat is available on Eglin, RCWs have continued to nest and forage near TA B-12.

Non-impulsive noise and general disturbance would be caused by activities including ground maneuvers and vehicle operation. However, overall, noise and disturbance levels would be low compared to munitions use, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced on the test area, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area temporarily or long term. In some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have been documented on and near TA B-12. Ground-disturbing activities may potentially facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA B-12.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA B-12.

3.3.2.1.8 TA B-70

Testing and Training

Direct Strike

Wildlife could be physically impacted by numerous effectors during testing and training activities on TA B-70, including air-to-surface bombs and missiles, surface-to-surface cruise missiles, rockets, small arms rounds, explosives, ground training and paratroop activities, drone take-offs and landings, vehicles, and radar. Physical impacts could occur because of direct strikes or EMR exposure or, in the case of live ordnance, shrapnel and explosive shock waves. Overall, the potential for wildlife to be physically impacted by munitions, drones, and radar is low. Most bombs, missiles, gunnery rounds, and other munitions strike their targets or fall close to the targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. Birds and bats would be unlikely to occur in the air at the same time and altitude a drone was operated, and therefore, intersection with a drone would be improbable. Paratrooper and ground training activities that only involve personnel on foot would not be expected to cause adverse impacts on wildlife and vegetation. Vehicles are used primarily on established roads and they avoid wetlands, which limits the potential for impacts.

As discussed in Appendix A (Eglin A and B Ranges Biological Resources), radars are typically located in developed/maintained areas that provide little quality wildlife habitat, are higher than the tree lines of adjacent forested areas, and have safety features to prevent radar beams accidentally contacting vegetation, animals on the ground, and tree-dwelling animals and nests. Due to the rapid decrease of radiation levels with distance, ground- and tree-dwelling wildlife would not likely be exposed to radiation levels associated with adverse effects. Birds, bats, and insects may potentially fly through the path of a radar beam. Due to the volume of space occupied by a radar beam, the probability of an animal flying within a hazard area is low. The potential for prolonged exposure is extremely low due to the movement of the animal. If an animal flies or hovers directly within the path of a beam, thermal stress would likely trigger it to fly in another direction, and any associated impact would be short term.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) and the tempo of testing and training activities on TA B-70, the potential for wildfires is high. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees and trees potentially used by tricolored bats, kestrels, and migratory birds are present on and in the vicinity of the test area. While it is conceivable that an RCW, tricolored bat, migratory or state-listed bird, or monarch butterfly could intersect the path of a munition, shrapnel from a live munition, drone, or radar beam, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations could result in the collapse of gopher tortoise burrows. Typically, tortoises would be able to dig out of the sandy test area soils if a burrow entrance collapsed. There is the potential for commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows to be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. Previous analysis of potential strikes to burrowing owls concluded that, considering the landing radius and direct impact area of the largest munitions used on TA B-70, the probability of a direct hit would be extremely small (DAF, 2009). The analysis also concluded that the probability of shrapnel striking a gopher tortoise or burrowing owl would be very small. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Many activities on TA B-70 involve ground disturbance, which can cause or intensify existing erosion. Craters produced by bombs, missiles, other munitions, and pyrotechnics can result in soil displacement. Other effectors such as troop movement, vehicle operation, and helicopter rotorwash can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated areas that occur on and near the complex, including HQNCs and an ONA. Soil generally appears to be stable on the test area, and significant erosion issues are not known. Previous analysis of TA B-70 determined that there were isolated eroded areas at some targets and the helicopter DZ, but there was no evidence that eroded sediments were moving off site or affecting surface waters (DAF, 2009). Flat terrain around these areas apparently limits transport of eroded soil. Targets are not located near streams or wetlands. If substantial erosion issues were found, Eglin would implement corrective actions. Management requirements restrict certain ground activities and the use of munitions near surface waters and wetlands. In the unlikely event that an expended item were to be accidentally deposited in a stream or wetland, bottom sediments could be disturbed and cause turbidity. Such occurrences would be infrequent. Heavy equipment would not be operated on stream slopes during retrieval. Vehicle use is confined to existing roads, and operators are required to avoid driving on steep slopes and to cross streams only at established crossing sites.

Expenditure of some items would result in deposition of metals, explosives and explosives by-products, and other materials on TA B-70. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of constituents in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at individual heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial erosional transport of metals and chemical constituents to streams and wetlands would not be likely. Previous analysis concluded that chaff and flares would not adversely affect soils or water resources on or near the test area (DAF, 2009). Eglin restricts the use of chaff and flares within 100 feet of water bodies and directs that they are never to be thrown directly into a water body, and restricts the release of chemicals or metals into streams. The potential for impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the reticulated flatwoods salamander, alligator snapping turtle, or little blue heron. Due to distance from the test area, intervening topography, and elevated ground associated with RR 236, transport of sediments, metals, and chemical materials into Okaloosa darter streams such as Turkey Creek would be very unlikely. Eglin restricts the release of chemicals or metals within a 1,500-foot buffer around flatwoods salamander habitat. Vehicles, especially tracked vehicles, have the potential to collapse Florida burrowing owl and gopher tortoise burrows and cause soil disturbance and erosion issues for wetland areas. However, because vehicles avoid wetlands and are primarily kept on established roads, the potential for such impacts would be minimal. Soil disturbance from munitions impacts is concentrated around established target areas, which are on relatively flat terrain with low potential for erosion.

As described in the 2009 *Test Area B-70 Range Environmental Assessment* (DAF, 2009), prior to missions involving extensive off-road activities in the vicinity of owl or gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises, burrowing owls, gopher tortoise burrows, and owl burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis)and survey prior to construction.

Wildfires of high intensity may damage or destroy RCW cavity trees, but adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential. Overall, wildfires would primarily be beneficial to the habitats of protected species, particularly burrowing owls, RCWs, gopher tortoises, and flatwoods salamanders.

Noise and Other Disturbance

Impulsive noise would be produced on TA B-70 by bombs, missiles, artillery, explosives, small arms fire, and sonic booms associated with supersonic aircraft operations. Wildlife on and adjacent to the test area could hear and potentially react to the sounds. Typical effects would include stress and temporary behavioral reactions. Hearing damage could also occur in animals near a loud, impulsive noise source. Previous analysis concluded that sonic booms would expose numerous active and inactive RCW trees, RCW foraging habitat, and owl burrows to noise levels of 140 dB (which can cause hearing loss in humans) or higher (DAF, 2009). Negative reproductive effects have not been observed in the RCW clusters near TA B-70, and the overall population has continued to grow. It appears that RCWs on Eglin are tolerant of noise associated with military missions, including sonic booms. Although other suitable habitat is available on Eglin, RCWs and burrowing owls have continued to nest and forage at and near TA B-70. Quality habitat appears to outweigh any negative influences associated with sonic booms. Individuals may have become habituated to the noise. In contrast to humans, birds can regenerate hair cells even after considerable losses, indicating that birds may be more resilient from hearing damage than humans (Bowles, 1995).

Other noise sources such as bombs, Maverick missiles, artillery, and C-4 explosives would produce noise on and near the test area, in some cases at levels above 140 dB. Impulse noise from these sources has the potential to affect the behavior, reproduction, and hearing ability of wildlife, including protected species. Target areas and other frequently impacted areas are generally not considered high-quality habitat, reducing the number of animals potentially affected. In addition, large munitions are used infrequently. Although wildlife would be impacted by impulse noise, detectable effects at the population level would not be expected. As discussed for sonic booms, protected species seem to be tolerant of noise produced on the test area to some degree, indicating that quality habitat outweighs adverse noise-related effects for at least some species.

Non-impulsive noise and general disturbance would be caused by activities including ground maneuvers, vehicle operation, and drone operation. Although some activities such as heavy vehicle operation would produce substantial noise and vibration, overall noise and disturbance levels would be low compared to sonic booms and detonations, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced during testing and training, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area long term. In addition, in some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have been documented on and adjacent to portions of TA B-70. Ground-disturbing activities may potentially facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Managements), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA B-70.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA B-70.

3.3.2.1.9 TA B-71

Testing and Training

Direct Strike

Wildlife could be physically impacted by numerous effectors during testing and training activities on TA B-71, including bombs, missiles, rockets, grenades, small arms rounds, explosives, and vehicles. Physical impacts could occur because of direct strikes or, in the case of live ordnance, shrapnel and explosive shock waves. Overall, the potential for wildlife to be physically impacted would be low. Munitions are directed toward targets, and most munitions strike or fall close to their targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. Vehicles are used primarily on established roads and they avoid wetlands, which limits the potential for impacts.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) and the tempo of testing and training activities on TA B-71, the potential for wildfires is moderate. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees are present near the test area, and trees potentially used by tricolored bats, kestrels, and migratory birds are present on and near the test area. While it is conceivable that an RCW, tricolored bat, migratory or state-listed bird, or monarch butterfly could intersect the path of munitions or shrapnel from a live munition, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations could result in the collapse of gopher tortoise burrows. Typically, tortoises would be able to dig out of the collapsed burrow, although commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows could be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. The potential for a direct strike of a burrowing owl would be low due to the low number and dispersed distribution of burrows on the test area. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Numerous activities on TA B-71 involve ground disturbance, which can cause or intensify existing erosion. Craters produced by bombs, missiles, other munitions, and pyrotechnics can result in soil displacement. Other effectors such as vehicle operation can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and

FNAI-designated areas that occur on and near the complex, including HQNCs. Soil generally appears to be stable on the test area, and significant erosion issues are not known. Targets and ground testing areas are not located near streams or wetlands. If substantial erosion issues were found, Eglin would implement corrective actions. Management requirements restrict certain ground activities and the use of munitions near surface waters and wetlands. Vehicles are generally operated on existing roads.

Expenditure of some items would result in deposition of metals, explosives, explosives by-products, and other materials on TA B-71. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of metals and explosives in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of these materials at individual heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial erosional transport of metals and chemical constituents to streams and wetlands would not be likely. The potential for substantial impacts resulting from accidental spills of petroleum-based products, including diesel fuel and jet fuel, would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the reticulated flatwoods salamander, alligator snapping turtle, or little blue heron. Due to distance from the test area, intervening topography, and elevated ground associated with RR 236, transport of sediments, metals, and chemical materials into Okaloosa darter streams such as Turkey Creek would be very unlikely. Eglin restricts the release of chemicals or metals within a 1,500-foot buffer around flatwoods salamander habitat. Vehicles have the potential to collapse Florida burrowing owl and gopher tortoise burrows and cause soil disturbance and erosion issues for wetland areas. However, because vehicles avoid wetlands and are primarily kept on established roads, the potential for such impacts would be minimal. Soil disturbance from munitions impacts and detonations is concentrated around established areas, which are on relatively flat terrain with low potential for erosion.

Prior to missions involving extensive off-road activities in the vicinity of owl or gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises, burrowing owls, gopher tortoise burrows, and owl burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis) and survey prior to construction.

Wildfires of high intensity may damage or destroy RCW cavity trees, but adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential. Overall, wildfires would primarily be beneficial to the habitats of protected species, particularly burrowing owls, RCWs, gopher tortoises, and flatwoods salamanders.

Noise and Other Disturbance

Impulsive noise would be produced on TA B-71 by bombs, missiles, rockets, mortar rounds, grenades, small arms fire, and other detonations. Wildlife on and adjacent to the test area, including protected species such as the RCW and burrowing owl, could hear and potentially react to the sounds. Typical effects would include stress and temporary behavioral reactions. Hearing damage could occur in animals near a loud, impulsive noise source. Negative reproductive effects have not been observed in the RCW clusters near TA B-71, and the overall population has continued to grow. It appears that RCWs on Eglin are tolerant of noise and other disturbance associated with military missions. Although other suitable habitat is available on Eglin, RCWs and burrowing owls have continued to nest and forage at and near TA B-71. Quality habitat appears to outweigh any negative influences associated with disturbance. Individuals may have become habituated to noise. In contrast to humans, birds can regenerate hair cells even after considerable losses, indicating that birds may be more resilient from hearing damage than humans (Bowles, 1995). Although wildlife would be impacted by impulse noise, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance levels, such as that caused by vehicle operation and human activities, would be low compared to sonic booms and detonations, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced during testing and training, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area long term. In addition, in some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have not been documented on TA B-71, but occur in the vicinity. Ground-disturbing activities may potentially introduce or facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA B-71.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA B-71.

3.3.2.1.10 TA B-75

Testing and Training

Direct Strike

Wildlife could be physically impacted by numerous effectors during testing and training activities on TA B-75, including bombs, missiles, rockets, various sized rounds, grenades, explosives, unmanned aerial vehicles, and ground vehicles (including tanks). Physical impacts could occur because of direct strikes or, in the case of live ordnance, shrapnel and explosive shock waves. Overall, the potential for wildlife to be physically impacted by munitions and vehicles is low. Munitions are directed at targets, and most munitions strike or fall close to the targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. Birds and bats would be unlikely to occur in the air at the same time and altitude an aircraft was operated, and therefore, strikes would be improbable. Vehicles are used primarily on established roads and they avoid wetlands, which limits the potential for impacts.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources) and the tempo of testing and training activities on TA B-75, the potential for wildfires would be high. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees are present near the test area, and trees potentially used by tricolored bats, kestrels, and migratory birds are present on and near the test area. While it is conceivable that an RCW, tricolored bat, migratory or state-listed bird, or monarch butterfly could intersect the path of a munition, shrapnel from a live munition, or aircraft, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations could result in the collapse of gopher tortoise burrows. Typically, tortoises would be able to dig out of collapsed burrows, although commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows could be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. The potential for direct strikes of burrowing owls would be low due to the low number and dispersed distribution of burrows. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Many activities on TA B-75 involve ground disturbance, which can cause or intensify existing erosion. Craters produced by bombs, missiles, other munitions, and pyrotechnics can result in soil displacement. Other effectors such as troop movement, vehicle operation, and tank operation can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated areas that occur on and near the complex, including HQNCs, an ONA, and a significant botanical site. Soil generally appears to be stable on the test area, and significant erosion issues are not known. Targets are not located near streams or wetlands. If substantial erosion issues were found, Eglin would implement corrective actions. Management requirements restrict certain ground activities and the use of munitions near surface waters and wetlands. Vehicle use is generally confined to existing roads, and operators are required to avoid driving on steep slopes.

Expenditure of some items would result in deposition of metals, explosives and explosives by-products, and other materials on TA B-75. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of constituents in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of metals or other constituents at individual heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial erosional transport of metals and chemical constituents to streams and wetlands would not be likely. The potential for substantial impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the reticulated flatwoods salamander, alligator snapping turtle, or little blue heron. Eglin restricts the release of chemicals or metals within a 1,500-foot buffer around flatwoods salamander habitat. Vehicles, especially tracked vehicles, have the potential to collapse Florida burrowing owl and gopher tortoise burrows and cause soil disturbance and erosion issues for wetland areas. However, because vehicles avoid wetlands and are primarily kept on established roads, the potential for such impacts would be minimal. Soil disturbance from munitions impacts is concentrated around established target areas, which are on relatively flat terrain with low potential for erosion.

Prior to missions involving extensive off-road activities in the vicinity of owl or gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises, burrowing owls, gopher tortoise burrows, and owl burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis) and survey prior to construction.

Wildfires of high intensity may damage or destroy RCW cavity trees, but adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential. Overall, wildfires would primarily be beneficial to the habitats of protected species, particularly burrowing owls, RCWs, gopher tortoises, and flatwoods salamanders.

Noise and Other Disturbance

Impulsive noise would be produced on TA B-75 by bombs, missiles, rockets, various sized rounds, grenades, and explosives. Wildlife on and adjacent to the test area could hear and potentially react to the sounds. Typical effects would include stress and temporary behavioral reactions. Hearing damage could also occur in animals near a loud, impulsive noise source. Previous analysis indicated that the largest munitions used on the test area (C-4 explosives, 2,4,6-trinitrotoluene [TNT] bare charges, and .50-caliber rounds) could expose active and inactive RCW trees to noise levels of 140 dB (which can cause hearing loss in humans) or higher (DAF, 2013a). It is presumed that burrowing owl burrows could potentially be exposed to similar maximum noise levels. Negative reproductive effects have not been observed in the RCW clusters near TA B-75, and the overall population has continued to grow. It appears that RCWs on Eglin are tolerant of noise associated with military missions, including sonic booms. Although other suitable habitat is available on Eglin, RCWs and burrowing owls have continued to nest and forage at and near TA B-75. Quality habitat appears to outweigh any negative influences associated with disturbance. Individuals may have become habituated to the noise. In contrast to humans, birds can regenerate hair cells even after considerable losses, indicating that birds may be more resilient from hearing damage than humans (Bowles, 1995). Although wildlife would be impacted by impulse noise, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance would be caused by activities including vehicle, tank, and target aircraft operation. Although some activities such as heavy vehicle operation would produce substantial noise and vibration, overall noise and disturbance levels would be low compared to detonations, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced during testing and training, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area long term. In addition, in some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have been documented on and near portions of TA B-75. Ground-disturbing activities may potentially facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA B-75.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA B-75.

3.3.2.1.11 TA B-82

Testing and Training

Direct Strike

Wildlife could be physically impacted by numerous effectors during testing and training activities on TA B-82, including bombs, missiles, and various submunitions and explosives, and vehicles. Physical impacts could occur because of direct strikes or, in the case of live ordnance, shrapnel and explosive shock waves. Overall, the potential for wildlife to be physically impacted would be low. Munitions are directed toward targets, and most munitions strike or fall close to their targets. Areas where these items are used are generally of low wildlife habitat quality for most species, which reduces the likelihood of wildlife occurrence. In addition, general disturbance associated with testing and training events could cause animals to leave an affected area, further reducing the potential for direct impacts. Vehicles are used primarily on established roads, which limits the potential for impacts.

Based on historical data (Appendix A, Eglin A and B Ranges Biological Resources), the potential for wildfires on TA B-82 would be low. Fires may injure or kill wildlife. Mobile species could potentially avoid fires and the effects of smoke inhalation. Small and relatively less mobile species would more likely be impacted. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for physical impacts.

The potential for impacts on protected species would be comparable to that of wildlife in general. RCW cavity trees are present near the test area, and trees potentially used by tricolored bats, kestrels, and migratory birds are present on and near the test area. While it is conceivable that an RCW, tricolored bat, migratory or state-listed bird, or monarch butterfly could intersect the path of munitions or shrapnel from a live munition, the probability is low. Personnel would be instructed to avoid wildlife, particularly protected species, when possible. Detonations could result in the collapse of gopher tortoise burrows. Typically, tortoises would be able to dig out of collapsed burrows, although commensal species such as the eastern indigo snake and Florida pine snake that may occupy burrows could be entombed. Avoidance of active burrows by at least 25 feet would reduce the potential for burrow collapse. Tortoises would be relocated, if necessary, in accordance with FWC protocols. All activities would be subject to requirements contained in the *Indigo Snake Programmatic Biological Opinion* (USFWS, 2009), *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and *Final Gopher Tortoise Programmatic Conference Opinion* (USFWS, 2020b). All personnel would be instructed on the protection of habitat, wildlife, and sensitive species. EAFBMAN 13-212, *Range Planning and Operations*, identifies the measures that are required to be implemented by users of the Eglin Range to avoid and minimize potential impacts on biological resources, including the RCW, gopher tortoise, and other sensitive species.

Habitat Alteration

Numerous activities on TA B-82 involve ground disturbance, which can cause or intensify existing erosion. Craters produced by bombs, missiles, other munitions, and pyrotechnics can result in soil displacement. Other effectors such as vehicle operation can also disturb and displace soil. Erosion may lead to sedimentation and siltation effects in streams, wetlands, floodplains, and FNAI-designated HQNC areas that occur near the test area. Significant erosion issues are not known on the test area. Targets are not located near streams or wetlands. If substantial erosion issues were found, Eglin would implement corrective actions. Management requirements restrict certain ground activities and the use of munitions near surface waters and wetlands. Vehicles are generally operated on existing roads.

Expenditure of some items would result in deposition of metals, explosives, explosives by-products, and other materials on TA B-82. As described in Appendix A (Eglin A and B Ranges Biological Resources), accumulation of metals and explosives in soils of the test area would probably have little overall potential to degrade soil quality to a level that would significantly impact organisms. However, the concentrations of these materials at individual heavily used locations (e.g., targets) could be substantially greater than the overall test area concentration. Therefore, the potential for adverse impacts to biological resources would be greater. Such areas likely support comparatively low wildlife occurrence due to the frequent disturbance and reduced habitat value. Substantial erosional transport of metals and chemical constituents to streams and wetlands would not be likely. The potential for substantial impacts resulting from accidental spills of petroleum-based products would be low. Procedures and responsibilities for responding to spills of fuel or other hazardous materials are described in the Eglin AFB SPCC Plan.

Vegetation removal resulting from wildfires would decrease forage and prey items for wildlife, but the effect would be temporary. Fires are generally beneficial to many of the natural communities and associated species on Eglin AFB. However, fires of high intensity may damage or destroy habitat components. Adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential for adverse habitat impacts.

The potential for impacts on habitats for protected species would be comparable to that of general wildlife habitat. Substantial erosion of test area soils into streams or wetlands would not be expected and would therefore not affect habitat for the alligator snapping turtle or little blue heron. Due to distance from the test area, intervening topography, and elevated ground associated with RR 236, transport of sediments, metals, and chemical materials into Okaloosa darter streams such as Turkey Creek would be very unlikely. Eglin restricts the release of chemicals or metals within a 1,500-foot buffer around flatwoods salamander habitat. Vehicles have the potential to collapse gopher tortoise burrows and cause soil disturbance and erosion issues for wetland areas. However, because vehicles avoid wetlands and are primarily kept on established roads, the potential for such impacts would be minimal. Soil disturbance from munitions impacts and detonations is concentrated around established areas, which are on relatively flat terrain with low potential for erosion.

Prior to missions involving extensive off-road activities in the vicinity of gopher tortoise burrows, Eglin Natural Resources Office personnel would install markers for avoidance next to burrows. Troops would be instructed to avoid gopher tortoises, burrowing owls, gopher tortoise burrows, and owl burrows, and not to dig within 25 feet of any burrow. Any potential digging or ground disturbance would require a separate AF Form 813 (Request for Environmental Impact Analysis) and survey prior to construction.

Wildfires of high intensity may damage or destroy RCW cavity trees, but adherence to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) would reduce the potential. Overall, wildfires would primarily be beneficial to the habitats of protected species, particularly burrowing owls, RCWs, and gopher tortoises.

Noise and Other Disturbance

Impulsive noise would be produced on TA B-82 by bombs, missiles, and various submunitions and explosives. Wildlife on and adjacent to the test area, including protected species such as the RCW, could hear and potentially react to the sounds. Typical effects would include stress and temporary behavioral reactions. Hearing damage could occur in animals near a loud, impulsive noise source. Negative reproductive effects have not been observed in the RCW clusters near TA B-82, and the overall population has continued to grow. It appears that RCWs on Eglin are tolerant of noise and other disturbance associated with military missions. Although other suitable habitat is available on Eglin, RCWs have continued to nest and forage near TA B-82. Quality habitat appears to outweigh any negative influences associated with disturbance. Individuals may have become habituated to noise. In contrast to humans, birds can regenerate hair cells even after considerable losses, indicating that birds may be more resilient from hearing damage than humans (Bowles, 1995). Although wildlife would be impacted by impulse noise, detectable effects at the population level would not be expected.

Non-impulsive noise and general disturbance levels, such as that caused by vehicle operation and human activities, would be low compared to explosions, with correspondingly lower potential to impact wildlife. Some animals likely are, or could become, habituated to noise produced during testing, reducing the potential for impacts related to stress, habitat abandonment, and disruption of important behaviors. However, some animals may avoid the test area long term. In addition, in some cases, habituation to human noise and disturbance could result in increased potential for animals to be exposed to impulsive noise or direct strikes. Overall, although non-impulsive noise would adversely affect some animals, including protected species, activities would not be expected to cause measurable impacts on wildlife populations.

Invasive Species

Invasive plant species have not been documented on TA B-82, but occur in the vicinity. Ground-disturbing activities may potentially introduce or facilitate the spread of invasive vegetation. Wildfires may have either beneficial or adverse impacts. To reduce the potential for spreading invasive species, activities would be subject, as applicable, to requirements and management practices provided in the Eglin AFB *Operational Component Plan for Management of Invasive Non-Native Species, Feral Animals, and Nuisance Native Wildlife* (Eglin AFB, 2020b) and Armed Forces Pest Management Board Technical Guide No. 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Summary

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts resulting from direct strikes, habitat alteration, noise and other disturbance, and introduction or spread of invasive species would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected because of testing and training activities on activities on TA B-82.

Range Clearance and Maintenance

Potential impacts resulting from range clearance and maintenance activities would be similar to those described for TA A-73. Direct strikes by vehicles or equipment and direct exposure to herbicides would be unlikely. Impacts from prescribed fires and habitat alteration would not result in adverse impacts to wildlife populations. Reactions to noise and general disturbance would be intermittent and short term. Substantial impacts resulting from erosion or accidental spills of petroleum-based products would not be expected, and the potential to introduce or spread invasive species would be low. Overall, potential impacts would be localized, long term, and of low intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources would not be expected as a result of range clearance and maintenance activities on TA B-82.

Table 3-9. Potential Impacts on Biological Resources from Testing and Training Activities Under the No Action Alternative

Test Area	Munitions							Explosives/Pyrotechnics (Number of Expenditures or Detonations)					Miscellaneous Explosive Components		Electromagnetic Radiation
	Large Ordnance (e.g., MK-66 Practice Bomb)		Large Cartridge (e.g., 105-mm Round)		Medium Cartridge (e.g., 40-mm Round)		Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Mines	Grenade	Simulators	C-4	Rocket/Missile	Smoke/Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator	
	Gnd	A/G	Gnd	A/G	Gnd	A/G	A/G, Gnd	Gnd	Gnd	Gnd	Gnd	A/G, Gnd	Gnd	Gnd	
A-73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
A-77	0	+	-	-	-	-	-	0	-	-	-	+	0	0	0
A-78	0	+	0	-	-	-	-	0	-	-	-	+	0	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
B-7	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
B-12	0	0	0	0	0	0	-	0	-	-	0	0	0	-	0
B-70	-	+	-	+	0	+	-	-	0	-	-	-	-	-	-
B-71	-	0	-	0	0	0	0	0	-	0	-	0	0	-	0
B-75	0	0	0	+	-	-	-	0	-	0	+	0	0	-	0
B-82	0	-	0	0	0	0	0	0	0	0	-	0	0	-	0

A/G = air-to-ground; Gnd = ground; mm = millimeter

Note: Description for symbols is provided in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Table 3-10. Potential Impacts on Biological Resources from Test Area and Road Maintenance Associated With Each Test Area Under the No Action Alternative

Test Area	Herbicides	Wheeled Vehicles	Wheeled Heavy Equipment	Tracked Heavy Equipment	Generators/Small Equipment	Point Impact—Land Disturbance	Incidental Surface Disturbance	Land Clearing	Plowing and Earth Moving	Culvert/Bridge/Ford Materials	Fill Dirt	Chainsaw/Tree Cutter	Biological Controls
A-73	0	0	-	-	0	0	0	-	-	0	0	0	0
A-77	0	0	-	-	0	0	0	-	-	0	0	0	0
A-78	0	0	-	-	0	0	0	-	-	0	0	0	0
A-79	0	0	-	-	0	0	0	-	-	0	0	0	0
A-90	0	0	-	-	0	0	0	-	-	0	0	0	0
B-7	0	0	-	-	0	0	0	-	-	0	0	0	0
B-12	0	0	-	-	0	0	0	-	-	0	0	0	0
B-70	0	0	-	-	0	0	0	-	-	0	0	0	0
B-71	0	0	-	-	0	0	0	-	-	0	0	0	0
B-75	0	0	-	-	0	0	0	-	-	0	0	0	0
B-82	0	0	-	-	0	0	0	-	-	0	0	0	0

Note: Description for symbols is provided in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.3.2.2 Alternative 1 (Current Plus Future)

3.3.2.2.1 TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Under Alternative 1, there would be no change in expenditures for TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, or B-82 relative to the No Action Alternative. The potential effects of range clearance and maintenance activities on biological resources would be the same as described for the No Action Alternative. Biological resources could be affected by minor construction, demolition, renovation, facility modification, and land clearing projects. Individual projects would affect less than 2 acres, and the total disturbed area would not exceed 250 acres. As with testing and training activities, potential impacts would consist of direct strikes, habitat loss and alteration, and noise and other disturbance.

Wildlife could be disturbed or physically impacted during construction, demolition, and land clearing. Most of the activities would probably occur in currently developed portions of the test areas/test sites. Such areas have limited habitat value for many species. Activities that occur in ecological associations such as sandhills, flatwoods, and wetlands would disturb a greater number of species, potentially including sensitive species. Wildlife in the project area could be temporarily disturbed or displaced due to noise and increased human presence. These effects would be short term and would affect only animals in the immediate project areas. Affected individuals would generally be able to return to the area after completion of activities. While individuals of some species could possibly be displaced long term, the affected areas would be small compared to other available habitat.

Construction and land-clearing activities could result in injury or mortality due to physical impacts. Potential impacts could include crushing by vehicles or construction equipment. Substantial numbers of wildlife would not likely be affected. In addition, most species that would be expected in construction areas are locally and regionally common, and the loss or displacement of these individuals would not result in overall population effects. Depending on the specific location, protected species with potential occurrence in the project areas include the tricolored bat, alligator snapping turtle, monarch butterfly, eastern indigo snake, migratory birds, and state-listed species (Florida pine snake, gopher tortoise, Florida burrowing owl, southeastern American kestrel, and little blue heron). Activities near flatwoods salamander buffers, RCW trees, or Okaloosa darter streams are not anticipated. Gopher tortoise burrows would be avoided by 25 feet or, if avoidance were not feasible, tortoises and any commensals would be relocated in accordance with FWC protocols. Personnel would be instructed to avoid activities that would cause collapse of tortoise burrows. Protected species, if observed, would be allowed to leave without being disturbed. Potential impacts on tricolored bats and migratory birds would generally be limited to disturbance, as birds would usually be able to avoid physical impacts.

Although the details of specific projects are unknown at this time, any land clearing would represent long-term habitat loss. Of the potential total 250 acres cumulatively affected, it is anticipated that some of this area would occur in currently developed parcels, resulting in little to no additional habitat loss. Activities taking place outside of currently developed areas would most likely occur in open grasslands/shrublands or sandhills habitats. While any habitat loss could adversely affect wildlife, including protected species, the area affected would be less than 0.05 percent of the Eglin land area. In the context of other available habitat, detectable population-level effects to any species would not be expected. Soil disturbance and increased impervious surface area could result in discharge of sediments and pollutants into surrounding streams and wetlands, reducing water quality and value as wildlife habitat. However, all projects would undergo EIAP review, and it is expected that BMPs and stormwater plans would minimize the potential for such impacts.

In summary, in the context of significance criteria discussed in Section 3.3.2 (Environmental Consequences), potential impacts to biological resources would be localized, long term, and of medium intensity. With implementation of management practices (Section 3.3.2.4, Management Actions), significant impacts to biological resources, including protected species, would not be expected.

3.3.2.2.2 TA A-73

Under Alternative 1, the potential effects of range clearance and maintenance activities on biological resources would be the same as described for the No Action Alternative. The potential effects of minor construction, demolition, renovation, facility modification, and land-clearing projects would generally be the same as described above for TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82, except that impacts would not be expected for the reticulated flatwoods salamander, alligator snapping turtle, and little blue heron due to lack of habitat on and near the test area.

Under Alternative 1, radar systems would be operated at two new test sites at TA A-73. As discussed in Appendix A (Eglin A and B Ranges Biological Resources) and summarized for the No Action Alternative, radar sites are typically located in areas that provide little quality wildlife habitat and have safety features to prevent radar beams from accidentally contacting vegetation, animals on the ground, and tree-dwelling animals and nests. Wildlife would not likely be exposed to radiation levels associated with adverse effects. Birds, bats, and insects, including protected species, may potentially fly through the path of a radar beam, but the probability of an animal flying within a hazard area is low. The potential for prolonged exposure is extremely low. Additionally, the new radar sites will be evaluated in detail in a future update to the Eglin EMR EA (DAF, 2017a).

There would be no significant impacts on biological resources from activities at TA A-73 under Alternative 1.

There would be no significant impacts on biological resources under Alternative 1 (Table 3-11).

Table 3-11. Potential Impacts on Biological Resources from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	Air-to-Ground Small Ordnance
A-73	-	-	-	-	0
A-77	-	-	-	0	0
A-78	-	-	-	0	0
A-79	-	-	-	0	0
A-90	-	-	-	0	0
B-7	-	-	-	0	0
B-12	-	-	-	0	0
B-70	-	-	-	0	-
B-71	-	-	-	0	0
B-75	-	-	-	0	-
B-82	-	-	-	0	0

Note: Description for symbols is provided in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.3.2.3 Cumulative Impacts

Ongoing and future testing and training missions, construction projects, natural resources management, and road and test area maintenance activities could affect the habitats and species addressed in this EA. Direct strikes may occur from munitions and ordnance use, vehicle strikes, wildfires, and EMR exposure but population-level impacts would not be expected. Multiple activities on Eglin may contribute to cumulative habitat degradation or fragmentation on small and large scales. Construction projects may convert some natural habitats to buildings, parking lots, roads, landscaped areas, and firing ranges. Increased range closures due to mission safety profiles may limit access for Eglin Natural Resources Office personnel to conduct necessary management, including prescribed fire, forest restoration activities, and endangered species monitoring. Ordnance and pyrotechnics use are likely to start wildfires, some of which will be beneficial for habitats, and some of which will degrade natural habitats. Past, present, and future road and test area maintenance activities would continue to affect species and habitats. Accumulated noise levels would not change appreciably for any areas with special status species, and therefore cumulative noise impacts are not anticipated. Invasive plant species could be introduced or spread because of ground-disturbing activities. Management practices described in Section 3.3.2.4 (Management Actions) are expected to reduce the potential for cumulative impacts. Overall, no significant impacts to biological resources would be anticipated.

3.3.2.4 Management Actions

The following management actions focus on avoidance and minimization of impacts to the biological resources analyzed in this EA. They do not address all the standard procedures and measures required to be implemented for Eglin Range operations, which include those specified in AFMAN 13-212, *Range Planning and Operations*, EAFBMAN 13-212, *Range Planning and Operations,* and other applicable range operation regulations and guidance documents. All personnel involved in testing and training operations, as well as maintenance activities, are expected to implement these management actions as applicable.

3.3.2.4.1 Testing and Training Activities

- Conduct testing/training operations only in areas designated/authorized for the operations.
- Ensure that all mission personnel are provided with restrictions regarding protected species (i.e., Range Standard Operating Procedures briefing), including maps when necessary.
- Drive vehicles only on existing roads and areas specifically designated/authorized for off-road vehicle use.
- Do not drive vehicles in wetlands, streams, or ponds. Cross streams only at established stream crossings.
- Do not dig holes or establish new cleared areas within 100 feet of any water body, wetland, or on steep slopes.
- Locate all new targets at least 200 feet from surface water bodies. To the extent possible, orient new targets so weapons are fired away from active RCW cavity trees.

- Do not use munitions, smokes, obscurants, or other pyrotechnics within 200 feet of Okaloosa darter streams or within 100 feet of other surface water bodies, wetlands, or on steep slopes. Do not use fog oil within 500 meters of surface water bodies.
- Annually consider potential impacts to the RCW from range operations, as detailed in the *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013), and follow pertinent requirements (summarized below):
  - Follow *Management Guidelines for the Red-Cockaded Woodpecker on Army Installations* (U.S. Army, 2007) (Table 3-12), unless prior approval has been given by the Chief of Natural Resources.
  - Check the fire danger rating daily, and follow the Eglin *Wildfire Specific Action Guide* (DAF, 2013b) restrictions for pyrotechnics use by class day.
  - Immediately notify the JTTOCC and Eglin Fire Dispatch of any wildfire observed.
  - Cutting of RCW cavity trees or any longleaf pine tree is prohibited without prior written authorization from the Chief of Natural Resources.
  - Coordinate with the Eglin Natural Resources Office prior to land clearing or target establishment and follow all construction-related requirements in the *Red-Cockaded Woodpecker Programmatic Biological Opinion* (USFWS, 2013).
  - Coordinate with the Eglin Natural Resources Office regarding any necessary pre- or post-surveys prior to activities that may harass the RCW.
  - Berms will be constructed to collect ammunition or shrapnel for missions that may impact active RCW cavity trees or foraging habitat.
  - Do not establish new high impact activities within 500 feet of active RCW trees, (e.g., HLZs), without prior written authorization from the Chief of Natural Resources.
  - Per Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*, Eglin must ensure adequate personnel and resources are available for addressing mission-started wildfires.
- Per EAFBMAN 13-212, *Range Planning and Operations*, and *Management Guidelines for the Red-Cockaded Woodpecker on Army Installations* (U.S. Army, 2007): Do not set up smoke generators or smoke pots within 200 feet of a marked RCW cavity tree, although the smoke may drift through the 200-foot circle around a cavity tree. Do not use 2-chlorobenzalmalononitrile (tear gas)/riot agents or hexachloroethane smoke of any type within 200 feet of a marked RCW cavity tree. Colored smoke grenades (except hexachloroethane smoke grenades) may be used within 200 feet of an RCW cavity tree. Adhere to all other restrictions identified in EAFBMAN 13-212, *Range Planning and Operations*, for training activities in active RCW buffer zones.
- Training activities allowed within 200 feet of marked RCW cavity tree will not exceed 2 hours.
- Adhere to all restrictions identified in EAFBMAN 13-212, pertaining to the flatwoods salamander, Okaloosa darter, gopher tortoise, and all other sensitive species addressed.

- Do not conduct any ground-disturbing activity (e.g., off-road driving or digging) within 200 feet of an Okaloosa darter stream. Do not clear land or establish targets within 300 feet of an Okaloosa darter stream.
- If any munitions inadvertently enter an Okaloosa darter stream, contact Eglin's Natural Resources Office immediately to coordinate removal of the munition.
- Adhere to applicable requirements of the *Post-Delisting Monitoring Plan for the Okaloosa Darter* (USFWS, 2022a), particularly the measures specific to Eglin AFB (summarized below):
    - Continue to include the Okaloosa darter in decision support tools during future range planning.
    - Incorporate enhanced BMPs into real estate agreements, construction projects, and other changes to base infrastructure to prevent future impacts to Okaloosa darter streams.
    - Continue to actively manage stream and upland habitat in Okaloosa darter watersheds to promote high functioning ecosystems, as outlined in the INRMP.
    - Continue to include monitoring for Okaloosa darter and stream habitat in the INRMP.
    - Continue to coordinate management actions or land use change with the USFWS through annual INRMP updates, coordination meetings, and other means.
- During fire-suppression activities, equipment operators will be directed to avoid gopher tortoises, burrows, and indigo snakes.
- If a gopher tortoise or indigo snake is encountered, allow it to leave the area before resuming activities.
- Prior to any land clearing or establishment of new targets, mission personnel must contact the Eglin Natural Resources Office to coordinate a gopher tortoise/indigo snake survey and any necessary relocation.
- Do not drive over, step on, fill, or in any way cause a gopher tortoise burrow to collapse. Avoid gopher tortoise burrows by at least 25 feet. If operations cannot avoid the burrow by 25 feet, the tortoise would be relocated in accordance with FWC protocols.
- Any indigo snakes located during surveys would be relocated in accordance with the *Eglin Indigo Snake Programmatic Biological Opinion* (USFWS, 2009).
- Conduct air-to-surface bombing and EOD detonations under favorable weather conditions to the extent practicable to minimize noise impacts on sensitive species.
- Follow the requirements identified in EAFBMAN 13-212, *Range Planning and Operations*, for wildfire prevention, reporting, and suppression procedures.
- Plan all applicable missions in accordance with the fire danger ratings identified in EAFBMAN 13-212. Fire danger ratings must be checked daily and all associated restrictions on pyrotechnics use per the ratings must be followed.
- For applicable missions, appoint a fire marshal daily (eligible personnel must have a minimum rank of a noncommissioned officer or equivalent rank) while on the range to ensure all personnel are instructed in the safe use of incendiary devices and to supervise the immediate suppression of fires.

- Attend all campfires at all times. Clear all leaves, brush, pine needles, etc., within at least 4 feet from the campfire. Do not start a campfire within 50 feet of a wooden structure or in any location where loss of control might lead to a facility, forest, or brush fire.
- Conduct a fire check (visual observation) after the use of pyrotechnics or munitions has ceased.
- When a range fire is started in a training area, the officer in charge will stop all training and concentrate on fighting the fire using all available personnel in accordance with guidance established in Section 4.3 (Fire Fighting) of EAFBMAN 13-212.
- Report wildfires immediately to the JTTOCC and Fire Dispatch, giving the location by coordinates or other recognizable geographic reference, when possible.
- Eglin will follow protocols detailed in the latest USFWS-approved INRMP regarding wildfire protection measures for sensitive species and habitats.
- Remove munitions debris from the range on a predetermined schedule in accordance with DAF regulations. Do not use heavy equipment to remove debris from wetlands or surface water bodies.
- Avoid deposition of blank casings, marking cartridges, Chem-lites, and pyrotechnics debris into water.
- Do not throw smokes, flares, or simulators directly into a water body. Do not release chemicals or metals into streams, wetlands, or water bodies.
- Do not release toxic aerosols within 300 feet of streams, wetlands, or water bodies.
- To prevent the introduction of invasive nonnative species, Eglin requires inspection of all out-of-area equipment prior to deployment in the field. Vehicles and equipment must be cleaned in accordance with Armed Forces Pest Management Board Technical Guide No. 31, *Operational Washdown and Agricultural Inspection Preparation for Military Conveyances and Equipment* (Armed Forces Pest Management Board, 2021).
- Activities requiring immediate notification of the Eglin Natural Resources Office, either directly or through JTTOCC:
    - RCW cavity tree (including wildfire damage) is damaged to the point where it is unsuitable for nesting or roosting. Eglin is required to replace the tree with an artificial cavity within 72 hours of damage. The responsible unit must coordinate with the Eglin Natural Resources Office to schedule a trained biologist to conduct this work.
    - RCW cavity trees, cavity start trees, or the surrounding soils are inadvertently damaged or disturbed during ground maneuvers. The responsible unit must coordinate with the Eglin Natural Resources Office to repair damage quickly (normally within 3 working days of notification).

Table 3-12. Training Activities Allowed/Not Allowed Within 200 Feet of Marked RCW Cavity Tree

Mission Activity	Allowed[1]
Maneuver and Bivouac:	
Hasty defense, light infantry, hands and hand tool digging only, no deeper than 2 feet, 2 hours maximum. Holes must be refilled.	Yes
Hasty defense, mechanized infantry/armor	No

Table 3-12. Training Activities Allowed/Not Allowed Within 200 Feet of Marked RCW Cavity Tree

Mission Activity	Allowed[1]
Deliberate defense, light infantry	No
Deliberate defense, mechanized infantry/armor	No
Establish command post, light infantry	No
Establish command post, mechanized infantry/armor	No
Assembly area operations, light infantry/mechanized infantry/armor	No
Establish CS/CSS sites	No
Establish signal sites	No
Foot transit through the cluster	Yes
Wheeled vehicle transit through the cluster[2]	Yes
Armored vehicle transit through the cluster[2]	Yes
Cutting natural camouflage, hard wood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than 2 hours	Yes
Weapons Firing:	
7.62-mm and below blank firing	Yes
.50-cal blank firing	Yes
Artillery firing point/position	No
Multiple launch rocket system firing position	No
All others	No
Noise:	
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman type devices	Yes
Pyrotechnics/Smoke:	
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil and/or graphic flakes[3]	Yes
Smoke grenades	Yes
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
Hexachloroethane smoke of any type	No
Digging:	
Tank ditches	No
Deliberate individual fighting positions	No
Crew-served weapons fighting positions	No
Vehicle fighting positions	No
Other survivability/force protection positions	No
Vehicle survivability positions	No

Source: (U.S. Army, 2007)
AF Form = Air Force Form; cal = caliber; CS = 2-chlorobenzalmalononitrile; CS/CSS = Combat Support/Combat Service Support; mm = millimeter; RCW = red-cockaded woodpecker
Notes:
1. Activities may require other approvals, such as a dig permit, AF Form 813, or cultural resource consultation.
2. Vehicles will not get any closer than 50 feet of a marked cavity tree unless on existing roads, trails, or firebreaks.
3. Smoke generators and smoke pots will not be set up within 200 feet of a marked cavity tree, but the smoke may drift through the 200-foot circle around a cavity tree.

3.3.2.4.2 Maintenance Activities

- All range maintenance personnel and contractors must be briefed on gopher tortoise requirements.

- Eglin Natural Resources Office personnel will work with maintenance personnel to identify gopher tortoise populations present within areas that are regularly maintained, and will jointly develop site-specific strategies to minimize impacts to gopher tortoises from maintenance activities.
- Maintenance activities that will result in ground disturbance require a gopher tortoise survey within 30 days of ground-disturbing activities, including but not limited to root raking, disking, tilling, roller drum chopping, earth moving, and digging a utility line. Proponent must contact the Eglin Natural Resources Office to arrange the survey. Burrows will either be marked with a 25-foot buffer for avoidance, or be relocated per the procedures detailed in the *Threatened and Endangered Species Component Plan* (Eglin AFB, 2020a).
- Equipment operators must be alert to the presence of burrows and tortoises for avoidance.
- In occupied tortoise habitat, or habitats where tortoise occupancy is unknown, avoid or minimize the use heavy equipment for maintenance activities when other reasonable alternatives are available (i.e., prescribed fire, herbicides).
- When heavy equipment will be used in known gopher tortoise areas, or in areas where tortoise occupancy is unknown, efforts are taken to schedule activities during cooler months (November to March) when tortoises are less likely to be active above ground.
- Follow the *Florida Forestry Wildlife Best Management Practices for State Imperiled Species* (FDACS, 2014) that pertain to gopher tortoises (see Section 2.6.2 of that document).
- Keep mowing of turf grass on road shoulders in tortoise habitat to a minimum width.
- When it is necessary to conduct roller drum chopping, limit it to a single pass with a single roller and avoid frequent, repeated roller drum chopping in the same area. Gopher tortoise surveys are required.
- When mowing in known gopher tortoise areas, or in areas where tortoise occupancy is unknown, set blades or cutters no lower than 18 inches above the ground when possible.
- Follow requirements in the *Long-Term Vegetation Control BA* (DAF, 2007b).

3.4 CULTURAL RESOURCES

As defined under 36 CFR 800.16(l)(1), "Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP] maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

The preservation of these historic properties is regulated by government laws and regulations, including the National Historic Preservation Act (NHPA) of 1966, as amended. The NHPA establishes policies and procedures for the preservation of historic resources by government entities for properties listed on or eligible for listing on the NRHP. In addition, the NHPA encourages state and local historic preservation by the establishment of local preservation offices and regulations. The DAF provides historic preservation guidance and procedures for compliance with the NHPA in DAFMAN 32-7003, *Environmental Conservation*.

3.4.1 Affected Environment

The A and B test areas are a mix of forested and cleared areas where a variety of ground and air operations take place. These test area boundaries and 0.25 mile surrounding the test areas encompass the Area of Potential Effects (APE) for this EA (see Figure 3-7). The APE outside of the test area boundaries is typically only indirectly affected by test area activities through sound, vibration, and overpressure effects from munitions detonation during range activities. Test area activities have a varied effect on the cultural resource dependent on the integrity of the cultural resource, the cultural resource NRHP status, and the activity performed in the test area. The following section describes the cultural resource affected environment for each test area.

3.4.1.1 TA A-73

In accordance with the DAF Cultural Resources Management (CRM) records, approximately 31 percent of TA A-73 has been surveyed, with only one NRHP-ineligible historic site, 8OK04262, and one NRHP-ineligible historic building identified within the range area (Eglin AFB, 2025). Forty-seven acres of high probability cultural resource areas have yet to be surveyed within A-73. Beyond the range, one NRHP-ineligible historical structure east of the range and the largest portion of historic site 8OK04262 are within 0.25 miles of the range, in addition to one NRHP-eligible multicomponent site and a potentially NRHP-eligible prehistoric site (Table 3-13). No TCPs, historic cemeteries, or historic districts were located within the APE for TA A-73.

Table 3-13. Archeological Sites and Historic Structures in the Vicinity of TA A-73

Site Number/Historic Building Name	Resource Description	NRHP Eligible
9554	Military Structure West of TA A-73	No
9558	Military Structure within TA A-73	No
8OK00170	Prehistoric Weeden Island	Potentially
8OK00171	Prehistoric Weeden Island; Late 19th- to Early 20th-Century Historic	Yes
8OK04262	Historic Military	No

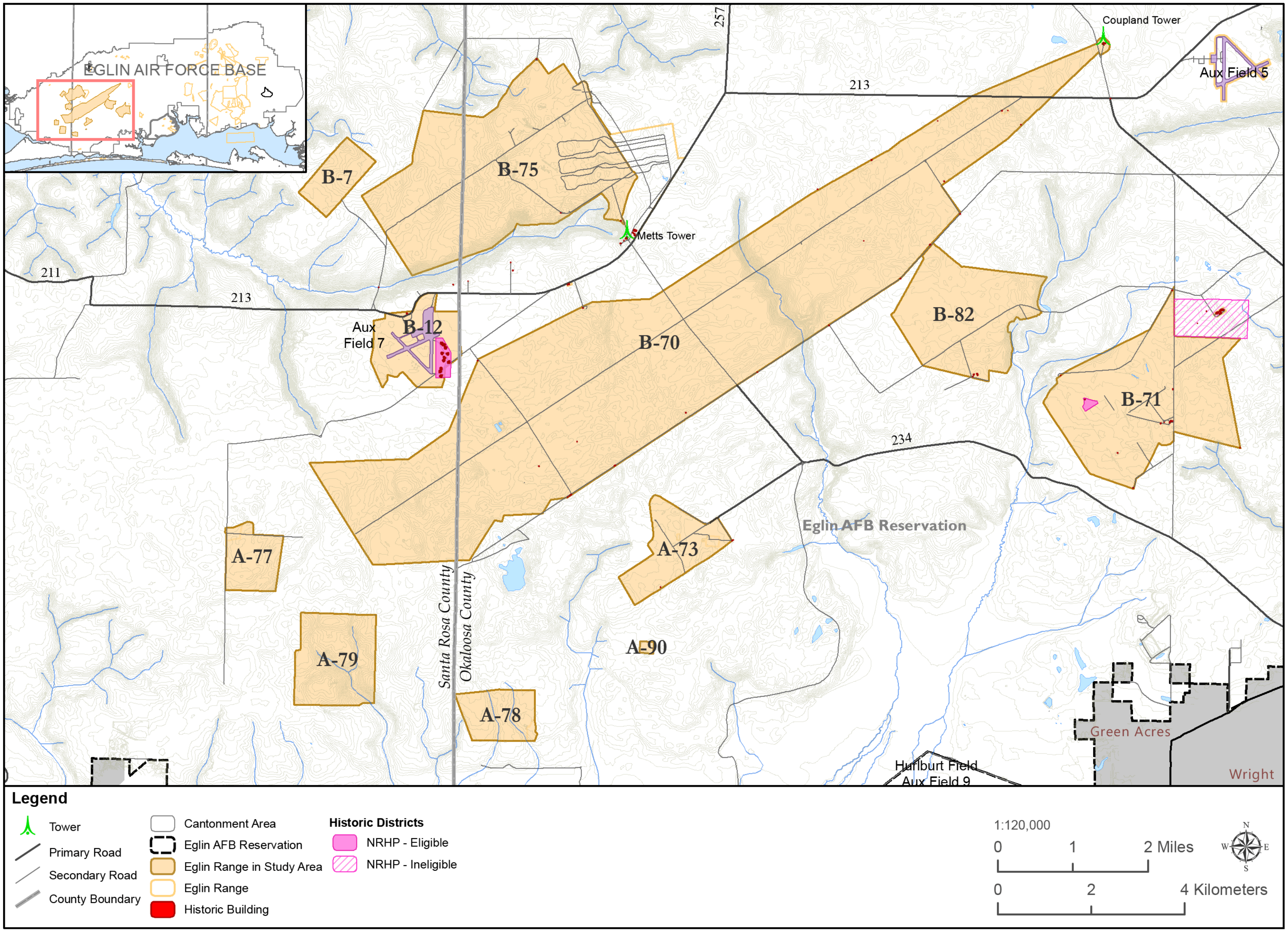
Source: (Eglin AFB, 2025)
NRHP = National Register of Historic Places; TA = Test Area

3.4.1.2 TA A-77

In accordance with the DAF CRM records, no cultural resource surveys were performed within TA A-77, even though the Range EA from 2013 indicates the completion of cultural resource surveys in TA A-77 (DAF, 2013a; Eglin AFB, 2025). No prehistoric sites, historic sites, historic structures, historic districts, historic cemeteries, or TCPs have been identified within TA A-77 or within 0.25 mile of TA A-77.

3.4.1.3 TA A-78

In accordance with the DAF CRM records, roughly 10 percent of TA A-78 has been surveyed for cultural resources (Eglin AFB, 2025). The Range EA from 2013 indicates all cultural surveys for TA A-78 have been completed (DAF, 2013a). No cultural sites are recorded within TA A-78; one NRHP-ineligible historic site, 8OK02688, is located within 0.25 mile of TA A-78. No prehistoric sites, historic districts, historic buildings. historic cemeteries or TCPs have been identified within the APE for TA A-78.



1

2 **Figure 3-7. Historic Structures Within Ranges A and B**

3.4.1.4 TA A-79

Approximately 85 percent of TA A-79 was surveyed for cultural resources and 25 acres of high probability cultural resource homestead areas have yet to be surveyed in accordance with the DAF CRM records (Eglin AFB, 2025). Within this test area, three cultural sites, 8SR01531, 8SR01515, and 8SR01562, are NRHP-eligible sites. In addition, 10 NRHP-ineligible cultural sites are located within TA A-79. NRHP-eligible site 8SR01515 extends beyond this test area boundary within 0.25 mile of the TA A-79. NRHP-eligible site 8SR01333, potentially NRHP-eligible site 8SR01541, and NRHP-ineligible sites 8SR01673 and 8SR01335 surround TA A-79 within 0.25 mile (Table 3-14). No historic buildings, historic districts, historic cemeteries or TCPs are located in the TA A-79 APE.

Table 3-14. Archeological Sites and Historic Structures in the Vicinity of TA A-79

Site Number	Resource Description	NRHP Eligible
8SR01531	20th-Century Historic	Yes
8SR01515	20th-Century Historic	Yes
8SR01562	Prehistoric Weeden Island	Yes
8SR01559	Prehistoric Weeden Island; 20th-Century Historic	No
8SR01557	Prehistoric Weeden Island	No
8SR01558	Indeterminate Prehistoric Site	No
8SR01541	Late 19th- to Early 20th-Century Historic	Potentially
8SR01673	Late Paleoindian/Archaic	No
8SR01335	Late 19th- to Early 20th-Century Historic	No
8SR01333	19th- to Early 20th-Century Historic	Yes
8SR00119	Prehistoric Weeden Island	No
8SR00118	Prehistoric Weeden Island	No
8SR00350	Indeterminate Prehistoric Site	No
8SR00110	Prehistoric Weeden Island	No
8SR01437	Indeterminate Prehistoric Site	No
8SR01547	Prehistoric Weeden Island	No
8SR01546	Indeterminate Prehistoric Site; Prehistoric Weeden Island	No

Source: (Eglin AFB, 2025)
TA = Test Area; NRHP = National Register of Historic Places

3.4.1.5 TA A-90

The entirety of TA A-90 has been surveyed for cultural resources in accordance with the DAF CRM records, with no cultural sites found inside this test area (Eglin AFB, 2025). No prehistoric sites, historic sites, historic districts, historic buildings. historic cemeteries or TCPs have been identified within the APE for TA A-90.

3.4.1.6 TA B-7

Approximately 94 percent of TA B-7 has been surveyed for cultural resource sites in accordance with DAF CRM records (Eglin AFB, 2025). Only areas within roughly 100 feet from the northwest and southeast perimeter roads are not surveyed. No cultural sites are located inside the TA B-7 boundary. Beyond the TA B-7 boundary and within 0.25 mile, two sites were determined to be NRHP ineligible: 8SR01514, an early 20th-century historic site; and 8SR01513, a prehistoric indeterminate site. No historic districts, historic buildings, historic cemeteries, or TCPs have been identified within the APE for TA B-7.

3.4.1.7 TA B-12

Approximately 20 percent of TA B-12 has been surveyed for cultural resources in accordance with DAF CRM records (Eglin AFB, 2025). No cultural resource sites are recorded within TA B-12. However, eight NRHP-ineligible cultural sites are identified outside of the TA B-12 boundary. Near the northern boundary of this test area is a historic building and water tower deemed ineligible for the NRHP. In the southeast potion of TA B-12, adjacent to Auxiliary Field 7 and extending beyond the boundary of TA B-12 to the southeast, is a historic district eligible for NRHP status under Criterion G. This historic district contains Cold War-era TAB-VEE shelters potentially eligible for NRHP status as individual structures and collectively NRHP eligible as a historic district (Figure 3-7). Twelve acres of the historic district and approximately 46 additional high probability cultural resource areas have yet to be surveyed. Beyond the TA B-12 boundary and within 0.25 mile are two additional historic structures, a theodolite station and a lookout tower. These historic structures are deemed to be NRHP ineligible (Table 3-15). No historic cemeteries or TCPs have been identified within the APE for TA B-12.

Table 3-15. Archeological Sites and Historic Structures in the Vicinity of TA B-12

Site Number/Historic Building Name	Resource Description	NRHP Eligible	Included in the Historic District
B-12 Shelter 11	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 02	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 05	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 04	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 03	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 12	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 01	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 10	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 07	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 06	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 09	TAB-VEE Shelter	Potentially	Yes
B-12 Shelter 08	TAB-VEE Shelter	Potentially	Yes
7101	Water Tower	No	No
7102	Structure Associated with the Water Tower	No	No
9406	Lookout Tower	No	No
9315	Theodolite Station	No	No
8SR01425	Indeterminate Prehistoric Site	No	NA
8SR02179	20th-Century Historic	No	NA
8SR02178	20th-Century Historic	No	NA
8SR01883	20th-Century Historic	No	NA
8SR01882	20th-Century Historic	No	NA
8SR01881	20th-Century Historic	No	NA
8OK02712	20th-Century Historic	No	NA
8OK02822	Late 19th- to Early 20th-Century Historic	No	NA

Source: (Eglin AFB, 2025)
NA = not applicable; NRHP = National Register of Historic Places; TA = Test Area

3.4.1.8 TA B-70

TA B-70 is a large test area with roughly 11 percent of the area surveyed for cultural resources and approximately 1,778 acres of high probability cultural resource homestead areas remaining to be surveyed in accordance with DAF CRM records (Eglin AFB, 2025). Twenty-eight historic structures are located within TA B-70. Of those 28 structures, 6 are NRHP-eligible bunkers and 22 are NRHP-ineligible structures. Cultural surveys inside TA B-70 identified 15 indeterminate prehistoric sites, one multicomponent site, and one 20th-century historic site. All the cultural sites located inside this test area are NRHP-ineligible. Beyond the TA B-70 boundary and within 0.25 miles are 17 additional cultural sites. Only two of these are determined to be potentially NRHP eligible. The remainder of the cultural sites within 0.25 mile of TA B-70 are NRHP ineligible (Table 3-16). No historic cemeteries or TCPs have been identified within the APE for TA B-70.

Table 3-16. Archeological Sites and Historic Structures in the Vicinity of TA B-70

Site Number/Historic Building Name	Resource Description	NRHP Eligible
8970	Military Building in the Northeast Compound	No
9300	Military Building in the Northeast Compound	No
8970 Pumphouse	Pumphouse in the Northeast Compound	No
9307	Military Building in the Northeast Compound	No
Bombproof Shelter 1	Bunker	Yes
Bombproof Shelter 6	Bunker	Yes
9301	Military Structure	No
9308	Military Structure	No
Bombproof Shelter 2	Bunker	Yes
Bombproof Shelter 5	Bunker	Yes
Bombproof Shelter 4	Bunker	Yes
Bombproof Shelter 3	Bunker	Yes
9402	Military Structure	No
9323	Theodolite Station	No
9304	Military Tower	No
9303	Military Tower	No
9313	Theodolite Station	No
9310	Support Shed	No
9315	Theodolite Station	No
9324	Pumphouse	No
9314	Military Tower	No
9311	Military Building	No
9302	Military Tower	No
9305	Military Tower	No
9317	Theodolite Station	No
9319	Storage	No
9321	Range Control	No
9322	Pumphouse	No
8OK00268	Indeterminate Prehistoric Site	No
8OK00270	Indeterminate Prehistoric Site	No
8OK00278	Indeterminate Prehistoric Site	No
8OK00281	Indeterminate Prehistoric Site	No
8OK00282	Indeterminate Prehistoric Site	No
8OK00283	Indeterminate Prehistoric Site	No
8OK00284	Indeterminate Prehistoric Site	No
8OK00285	Indeterminate Prehistoric Site	No
8OK00286	Indeterminate Prehistoric Site	No
8OK00287	Indeterminate Prehistoric Site	No
8OK00288	Indeterminate Prehistoric Site	No
8OK00289	Indeterminate Prehistoric Site	No
8OK00290	Indeterminate Prehistoric Site	No

Table 3-16. Archeological Sites and Historic Structures in the Vicinity of TA B-70

Site Number/Historic Building Name	Resource Description	NRHP Eligible
8OK00291	Indeterminate Prehistoric Site; Late 19th- to Early 20th-Century Historic	No
8OK00292	Indeterminate Prehistoric Site	No
8OK00293	Indeterminate Prehistoric Site	No
8OK02710	19th- to 20th-Century Historic	No
8OK00269	Indeterminate Prehistoric Site	No
8OK00294	Prehistoric Woodland; 20th-Century Historic	Potentially
8OK00295	Prehistoric Weeden Island; 20th-Century Historic	No
8OK00300	20th-Century Historic	No
8OK00301	20th-Century Historic	No
8OK02711	20th-Century Historic	No
8OK02712	20th-Century Historic	No
8OK02713	20th-Century Historic	No
8OK02796	20th-Century Historic	No
8OK02822	Late 19th- to Early 20th-Century Historic	No
8OK02823	Indeterminate Prehistoric Site; 20th-Century Historic	No
8OK02837	Prehistoric Swift Creek	Potentially
8OK02838	20th-Century Historic	No
8OK02839	20th-Century Historic	No
8OK02841	20th-Century Historic	No
8OK02874	20th-Century Historic	No
8OK02888	20th-Century Historic	No

Source: (Eglin AFB, 2025)
NRHP = National Register of Historic Places; TA = Test Area

3.4.1.9 TA B-71

Approximately 4 percent of TA B-71 is surveyed for cultural resources in accordance with DAF CRM records (Eglin AFB, 2025). Nine historic structures are located inside TA B-71, with only one structure, the range control house, eligible for NRHP status. In addition, one NRHP-ineligible historic site and an unassociated NRHP-eligible historic district are located inside this test area. The historic district encompasses a 1960s incendiary weapons test area. Within this historic district is the ARMT Research Test Facility, an NRHP-ineligible structure. The entirety of this NRHP-eligible historic district has yet to be surveyed for additional cultural resources along with 636 acres of high probability cultural resource homestead areas.

Beyond the boundary of TA B-71 and within 0.25 mile are 12 cultural sites. Only one of these sites is NRHP eligible. An NRHP-ineligible historic district located just to the northeast of TA B-71 encompasses the remains of the Nike Radar Site and Range 4a Bunker (Table 3-17). No historic cemeteries or TCPs have been identified within the APE for TA B-71.

Table 3-17. Archeological Sites and Historic Structures in the Vicinity of TA B-71

Site Number/Historic Building Name	Resource Description	NRHP Eligible	Within a Historic District
9612	Theodolite Station	No	No
9613	Theodolite Station	No	No
9614	Theodolite Station	No	No
9617	ARMT Research Test Facility	No	Yes
9605	Theodolite Station	No	No

Table 3-17. Archeological Sites and Historic Structures in the Vicinity of TA B-71

Site Number/Historic Building Name	Resource Description	NRHP Eligible	Within a Historic District
9615	Range Control House	Yes	No
9603	Military Structure	No	No
9451	Military Complex Structure	No	No
9601	Military Structure	No	No
8OK01109	Late 19th- to Early 20th-Century Historic	No	NA
Range 4A Bunker	Bunker	No	Yes
8OK00263	Indeterminate Prehistoric Site	No	NA
8OK00234	Indeterminate Historic Site	No	NA
8OK01094	Indeterminate Prehistoric Site; 20th-Century Historic	No	NA
8OK01095	Indeterminate Prehistoric Site; 20th-Century Historic	No	NA
8OK01101	20th-Century Historic	Yes	NA
8OK01102	Indeterminate Prehistoric Site; 20th-Century Historic	No	NA
8OK01107	Indeterminate Prehistoric Site; 20th-Century Historic	No	NA
8OK01108	Prehistoric Archaic	No	NA
8OK01109	Late 19th- to Early 20th-Century Historic	No	NA
8OK01199	20th-Century Historic	No	NA
8OK02716	20th-Century Historic	No	NA
8OK02147	20th-Century Historic	No	NA

Source: (Eglin AFB, 2025)
NA = not applicable; NRHP = National Register of Historic Places; TA = Test Area

3.4.1.10 TA B-75

Five percent of TA B-75 has been surveyed for cultural resources and approximately 418 acres of high probability cultural resource homestead areas remaining to be surveyed in accordance with DAF CRM records, although the TA B-75 Range EA from 2010 indicates all areas within TA A-75 are considered surveyed for cultural resources (Eglin AFB, 2010b; Eglin AFB, 2025). Only three NRHP-ineligible historic structures are located inside TA B-75. Surrounding TA B-75 are 14 NRHP-ineligible historic structures and one NRHP-eligible tower. Nineteen cultural sites are located within 0.25 mile of this test area. One of these sites is a historic NRHP-eligible site, with the remainder of the sites defined as ineligible for NRHP status. Additionally, south of TA B-75 is the Metts Family Cemetery (Table 3-18). Aboveground remnants of this cemetery are limited to a signpost marking the location of the cemetery. No historic districts or TCPs have been identified within the APE for TA B-75.

Table 3-18. Archeological Sites and Historic Structures in the Vicinity of TA B-75

Site Number/Historic Building Name	Resource Description	NRHP Eligible
9422	Theodolite Station	No
9411	Military Tower	No
9420	Military Structure	No
8SR00108	20th-Century Historic	No
8SR01425	Indeterminate Prehistoric Site	No
8SR01429	Prehistoric Deptford; Swift Creek; Weeden Island	No
8OK01052	Prehistoric Woodland	No
8OK01053	20th-Century Historic	Yes
8OK01054	Prehistoric Weeden Island; 20th-Century Historic	No

Table 3-18. Archeological Sites and Historic Structures in the Vicinity of TA B-75

Site Number/Historic Building Name	Resource Description	NRHP Eligible
8OK01055	Prehistoric Weeden Island; 20th-Century Historic	No
8OK01056	20th-Century Historic	No
8OK01057	20th-Century Historic	No
8OK01215	Indeterminate Prehistoric Site	No
8OK01216	Prehistoric Woodland or Later; 20th-Century Historic	No
8OK01217	Weeden Island; 20th-Century Historic	No
8SR02122	20th-Century Historic	No
8OK02148	Prehistoric Weeden Island	No
8OK02143	Prehistoric Weeden Island	No
8SR01514	20th-Century Historic	No
8OK01892	Indeterminate Prehistoric Site	No
8OK01891	Indeterminate Prehistoric Site; 20th-Century Historic	No
8OK00142	Indeterminate Prehistoric Site; Indeterminate Historic Site	No
9109	Building in Compound South of B-75	No
1071	Building in Compound South of B-75	No
9106	Building in Compound South of B-75	No
9121	Building in compound South of B-75	No
1070	Metts Tower	Yes
1073	Building in Compound South of B-75	No
9122	Building in Compound South of B-75	No
9111	Building in Compound South of B-75	No
9108	Building in Compound South of B-75	No
9101	Building in Compound South of B-75	No
1072	Pump House	No
9408	Building in Compound South of B-75	No
9103	Building in Compound South of B-75	No
9102	Building in Compound South of B-75	No
9105	Building in Compound South of B-75	No
	Metts Family Cemetery	NA

Source: (Eglin AFB, 2025)
NA = not applicable; NRHP = National Register of Historic Places; TA = Test Area

3.4.1.11 TA B-82

Cultural resource surveys have been performed on 38 percent of TA B-82 and approximately 325 acres of high probability cultural resource homestead areas remaining to be surveyed in accordance with DAF CRM records (Eglin AFB, 2025). On the southern border of TA B-82 is a small compound of historic buildings ineligible for NRHP status. In addition, two NRHP-ineligible cultural sites are located inside TA B-82. Beyond the boundary of TA B-82 and within 0.25 miles are 13 NRHP-ineligible sites and three NRHP-ineligible structures (Table 3-19). No historic districts, historic cemeteries, or TCPs have been identified within the APE for TA B-82.

Table 3-19. Archeological Sites and Historic Structures in the Vicinity of TA B-82

Site Number/Historic Building Name	Resource Description	NRHP Eligible
9602	Building Compound inside the Southern Border of B-82	No
9604	Building Compound inside the Southern Border of B-82	No

Table 3-19. Archeological Sites and Historic Structures in the Vicinity of TA B-82

Site Number/Historic Building Name	Resource Description	NRHP Eligible
9607	Building Compound inside the Southern Border of B-82	No
8OK00179	Late 19th-century to Early 20th-Century Historic	No
8OK00237	Indeterminate Historic Site	No
8OK01092	Indeterminate Prehistoric Site	No
8OK01093	Indeterminate Prehistoric Site; Late 19th- to 20th-Century Historic	No
8OK01103	Indeterminate Prehistoric Site	No
8OK01104	Prehistoric Woodland	No
8OK01106	Indeterminate Prehistoric Site	No
8OK01110	Prehistoric Weeden Island; 20th-Century Historic	No
8OK01112	Indeterminate Prehistoric Site; 20th-Century Historic	No
8OK01328	Prehistoric Weeden Island	No
8OK02892	Indeterminate Prehistoric Site; Late 19th- to mid-20th-Century Historic	No
8OK02891	20th-Century Historic	No
8OK02890	20th-Century Historic	No
8OK02893	20th-Century Historic	No
8OK02343	Prehistoric Weeden Island	No
9304	Military Tower	No
9323	Theodolite Station	No
9402	Military Structure	No

Source: (Eglin AFB, 2025)
NRHP = National Register of Historic Places; TA = Test Area

3.4.1.12 Summary of Potentially Affected Resources

A total of 3,466 acres within Range A and B test areas have been surveyed for cultural resources in accordance with the DAF CRM files (Eglin AFB, 2025). Additionally, in accordance with the 2013 Range EA and the TA B-75 Range EA, TAs A-77, A-78, and B-75 surveys are complete for cultural resources (Eglin AFB, 2010b; DAF, 2013a). A total of 76 historic structures are located inside the APE, with four historic structures identified in more than one 0.25-mile area surrounding individual test areas. One historic cemetery, two NRHP-eligible historic districts, and one NRHP-ineligible historic district are also located within the APE. Historic and prehistoric cultural sites identified inside the APE's total 107 sites include 64 sites containing historic components and 66 sites containing prehistoric components. Two of these cultural sites are in more than one 0.25-mile area surrounding individual test areas. A total of seven cultural sites are NRHP eligible, and four sites are potentially NRHP eligible (Table 3-20).

Table 3-20. Summary of Potentially Affected Cultural Resources on Eglin A and B Ranges

Area	Historic Site[1]			Historic Buildings			Prehistoric Cultural Site[1]			Historic District		Consult Potentially Required
	Eligible	Potentially Eligible	Not Eligible	Eligible	Potentially Eligible	Not Eligible	Eligible	Potentially Eligible	Not Eligible	Eligible	Not Eligible	
A-73	1	0	1	0	0	2	1	1	0	0	0	Yes
A-77[2]	0	0	0	0	0	0	0	0	0	0	0	No
A-78[2]	0	0	1	0	0	0	0	0	0	0	0	No
A-79	3	1	2	0	0	0	1	0	11	0	0	Yes
A-90[2]	0	0	0	0	0	0	0	0	0	0	0	No
B-7	0	0	1	0	0	0	0	0	1	0	0	No
B-12	0	0	7	0	12	4	0	0	1	1	0	Yes
B-70	0	1	16	6	0	22	0	2	19	0	0	Yes
B-71	1	0	10	1	0	9	0	0	6	1	1	Yes
B-75[2]	1	0	11	1	0	17	0	0	13	0	0	Yes
B-82	0	0	9	0	0	6	0	0	10	0	0	Yes

Source: (Eglin AFB, 2025)

Notes:

1. Multicomponent sites added to this table in both the prehistoric and historic site count
2. Indicates a completed survey for cultural resources within the test area in accordance with the sources indicated in the above section

3.4.2 Environmental Consequences

The Eglin AFB Cultural Resource Office is responsible for applying the standards set forth in the NHPA through the implementation of DAFMAN 32-7003, and the Integrated Cultural Resource Management Plan (ICRMP) (DAF, 2023). Activities restrictions, limitations, and mitigation measures are set forth in these documents to protect the cultural resources on Eglin AFB. The existing historic structures and cultural resources within the APE, as analyzed in accordance with these documents, were scrutinized for condition and evaluated to determine the effects of the Proposed Action and alternatives on the existing resources. As defined under 36 CFR 800.16(d), "Area of potential effects means the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist." The APE for this undertaking is not assumed to extend beyond 0.25 mile outside the Eglin Ranges A and B boundaries identified in Figure 3-7.

The level of impact on the cultural resources and the impact's potential significance is determined by considering how the effects of the Proposed Action could impact the cultural resource in terms of context, intensity, and duration.

Context of the undertaking on the cultural resources may be:

- Localized, with impacts to individual sites
- Regional, with effects to historic districts

Intensity can be either adverse or beneficial, and may be:

- Neutral, with no perceptible change to the cultural resource
- Low, with no management requirements needed, and unavoidable adverse impacts that would occur naturally
- Medium, with potential need for management requirements to avoid adverse impacts, and unavoidable adverse impacts, like uncovering previously unknown cultural sites
- High, with management requirements necessary to minimize or avoid adverse impacts, and unavoidable adverse effects that may not be recoverable

Duration may be:

- Short term, with an effect that would likely last for a few days to weeks
- Medium term, with an effect that would likely last for a few months to a year
- Long term, with an effect that would likely endure for the life of the action

To summarize the analysis presented in this section for cultural resources, Table 3-21, Table 3-22, and Table 3-23 show the potential impacts for the No Action Alternative and Alternative 1.

3.4.2.1 No Action Alternative

3.4.2.1.1 TA A-73

No Action Alternative cultural resource concerns at TA A-73 include potential localized impacts from inadvertent cultural resource site discoveries, modification caused by ground training operations on the western edge of TA A-73, road improvements, parking lot maintenance, and any groundbreaking operations already scheduled within TA A-73. Any operations occurring in the portions of TA A-73 without cultural resource surveys have the highest probability of discovering and disturbing new cultural sites with long-term unrecoverable damage to the site. Outside of the test area, no impacts to cultural resources are anticipated from noise or vibrations caused from mobile air defense systems activities within TA A-73. The cultural significance of the historic buildings within the APE are not impacted by building improvements or demolition since these buildings are not NRHP-eligible structures and not recommended for future NRHP considerations.

3.4.2.1.2 TA A-77

The ongoing use of air-to-ground munitions, mortars, rockets, and a variety of live-fire training munitions in TA A-77 and the lack of previously discovered cultural resources within this test area results in a neutral-to-low-intensity impact on cultural resources in TA A-77. Long-term effects of munitions impact on any previously undiscovered cultural sites have the potential to cause significant loss of cultural site integrity. However, the likelihood of finding undiscovered cultural sites is very low due to the completed test area cultural surveys and the current activities in this test area creating a significant UXO safety concern for future cultural resource surveys.

3.4.2.1.3 TA A-78

The level of impacts on cultural resources for TA A-78 are the same as the impacts described for TA A-77.

3.4.2.1.4 TA A-79

The lack of mission activity within TA A-79 would preclude any adverse effects on known or unknown cultural resources. The only potential impacts to cultural resources are effects from natural processes, travel along RR 234, any excavation in the clay/sand borrow pit, and any ground disturbance for mission-essential activities. The impacts from these activities are anticipated to be neutral or low as long as known cultural resources are avoided and the area where work is performed does not require a cultural survey.

3.4.2.1.5 TA A-90

The lack of cultural sites in TA A-90, coupled with the complete cultural survey of this entire test area, results in no impacts to known cultural resources by activities inside TA A-90. If any new cultural resources are identified in the future, the current small arms activities, target assembly, vegetation clearing, parking lot maintenance, and personnel movement would have limited impacts on site integrity.

3.4.2.1.6 TA B-7

The lack of cultural sites in TA B-7, coupled with the almost complete cultural survey of this entire test area, results in neutral-to-low impacts to cultural resources by activities inside TA B-7. The discovery of an unknown cultural site in the non-surveyed 6 percent of the test area is unlikely due to the location of the non-surveyed areas running parallel to the perimeter road at the edge of the test area. Additionally, the impacts of munitions in these areas are anticipated to be limited, as the non-surveyed areas are on the edge of the current TA B-7.

3.4.2.1.7 TA B-12

Cultural resource concerns within TA B-12 are variable depending on the nature of the resource. It is significantly easier to avoid direct impacts from test area activities to historic structures and the historic district than buried unknown cultural resource sites in areas not surveyed for cultural sites. Any ground-disturbing activities within cultural resource site boundaries will result in impacts to site integrity. The severity of the impacts are directly connected to the amount and depth of ground disturbance. Ground force tactical operations and aircraft assault landings on the existing runways are expected to result in significantly lower intensity impacts than munitions static testing and precision-guided munitions.

Conceivable impacts to the historic district and associated structures are likely to be caused by natural degradation of the structures with any lapse in maintenance, and viewshed disruption caused by short- to long-term modifications to the surrounding landscape. Significant impacts to the historic district and associated structures caused by long-term neglect or misguided munitions detonation would not only be a detriment to the individual structures and historic district but also to the regional knowledge of the Cold War. No significant impacts are anticipated to structures outside TA B-12 from noise or vibrations.

3.4.2.1.8 TA B-70

The NRHP-eligible and ineligible structures in the TA B-70 APE are designed for military use, with expected considerations for the structural integrity during test area activities at the time of construction. Managing any test area activity not considered during construction may potentially require mitigating the effects of the new activity on existing structures to limit the long-term impacts. Impacts to structures from lack of maintenance, misguided munitions detonation, overhead flights, or surrounding view shed disturbances have the potential to cause short- to long-term effects. Mitigating these impacts when they occur will be key to preserving these historic structures.

Buried cultural resources would experience neutral to low-intensity impacts from flight operations but high-intensity impacts from munitions impact. With the limited culturally surveyed areas and the potential for UXO, it is reasonable to anticipate cultural surveys in some areas of TA B-70 would cause a safety concern. Any unknown cultural resources in these areas of TA B-70 have the potential to lose all integrity from munitions impact.

3.4.2.1.9 TA B-71

TA B-71 APE historic structures are all military related and in varying degrees of degradation. The NRHP-eligible and ineligible structures in the TA B-71 APE are designed for military use, with expected considerations for their structural integrity during test area activities made at the time of construction. Managing any test area activity not considered during construction requires mitigating the effects of the new activity on existing structures to limit the long-term impacts on the historic structures. The most significant long-term impact to structures in the TA B-71 APE is the impact of neglect. For instance, structures inside the Nike Radar Site already suffered the long-term effects of this neglect, and the surrounding historic district is no longer eligible for NRHP status due to neglect.

A large portion of TA B-71 is covered in asphalt, effectively restricting the access to ground surfaces for cultural surveys and preserving any intact buried unknown cultural sites at the same time. Munitions detonation on top of the asphalt pad would have limited effects from heat and vibration on buried resources. As the remainder of TA B-71 has limited cultural surveys, there is still a possibility of locating unknown cultural resource sites but as long as all the static testing is occurring on the concrete pad, little or no impacts are anticipated to buried cultural sites beyond the concrete.

3.4.2.1.10 TA B-75

The limited recorded cultural resource sites, the completed cultural surveys within TA B-75, and avoidance of areas identified as containing cultural resources results in a low-intensity impact on cultural resources in this test area. The likelihood of finding previously unrecorded cultural sites is anticipated to be low, but the long-term effects of munitions impacts on any previously undiscovered cultural sites has the potential to cause significant loss of cultural site integrity. The current activities in this test area create a significant UXO safety concern for future cultural resource surveys.

The NRHP eligible structures in the TA B-75 APE are designed for military use, with expected considerations for their structural integrity during test area activities made at the time of construction. Managing any test area activity not considered during construction requires mitigating the effects of the new activity on existing structures to limit the long-term impacts on the historic structures. In addition, continued maintenance of existing NRHP-eligible structures is required to maintain their NRHP eligible status.

3.4.2.1.11 TA B-82

The munitions within the TA B-82 restricted target area create a significant UXO safety concern for any cultural resource surveys in this previously non-surveyed area. The integrity of any unknown cultural sites inside the TA B-82 restricted target area is anticipated to be reduced or destroyed due to ground disturbance from munitions impacts. In addition, the air-to-ground testing south of the restricted target area in previously non-surveyed locations is anticipated to have similar effects on cultural resources and similar UXO concerns.

Table 3-21. Potential Impacts on Cultural Resources from Testing and Training Activities Under the No Action Alternative

Test Area	Munitions								Explosives/ Pyrotechnics (Number of Expenditures or Detonations)						Miscellaneous Explosive Components
	Large Ordnance (e.g., MK-66 Practice Bomb)		Large Cartridge (e.g., 105-mm Round)		Medium Cartridge (e.g., 40-mm Round)		Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Mines	Grenade	Simulators	C-4	Rocket/Missile	Smoke/Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	Gnd	Gnd	Gnd	A/G, Gnd	Gnd	Gnd
A-73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-12	0	0	0	0	0	0	0	0 | -	0	-	0	0	0	0	0
B-70	- | +	- | +	- | +	- | +	0	- | +	0	0 | -	- | +	0	0	-	- | +	0	-
B-71	- | +	0	0 | +	0	0	0	0	0	0	-	0	-	- | +	0	-
B-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-82	0	- | +	0	0	0	0	0	0	0	0	0	-	0	0	-

A/G = air-to-ground; AFB = Air Force Base; Gnd = ground; ICRMP = Integrated Cultural Resource Management Plan; mm = millimeter; NRHP = National Register of Historic Places

Notes:

1. Implementation of the Eglin AFB ICRMP requires the avoidance of any NRHP-eligible or potentially NRHP-eligible sites. Therefore, impacts recorded on this table are based on the discovery of previously unrecorded cultural resources.
2. Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Table 3-22. Potential Impacts on Cultural Resources from Test Area and Road Maintenance Associated With Each Test Area Under the No Action Alternative

Test Area	Fixed- and Rotary-Wing Aircraft	Detonation Cord/C-4	Herbicides	Dismounted Maneuver	Wheeled Vehicles	Wheeled Heavy Equipment	Tracked Heavy Equipment	Generators/Small Equipment	Point Impact—Land Disturbance	Incidental Surface Disturbance	Land Clearing	Plowing and Earth Moving	Culvert/Bridge/Ford Materials	Fill Dirt	Chainsaw/Tree Cutter	Biological Controls
A-73	0	0	0	0 -	0	0	0	0	-	-	- +	0	0	0	0	0
A-77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-79	0	0	0	0	0	0	0	0	0	-	-	-	0	0	0	0
A-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-12	0	0	0	0 -	0 -	0 -	0 -	0	- +	-	- +	0	0	0	0	0
B-70	0	-	0	0	-	0 -	-	0	- +	-	- +	0	-	0	0	0
B-71	0	-	0	0	0	0	0	0	- +	-	- +	0	0	0	0	0
B-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-82	0	-	0	0	0	0	0	0	- +	-	- +	0	0	0	0	0

AFB = Air Force Base; ICRMP = Integrated Cultural Resource Management Plan; NRHP = National Register of Historic Places

Notes:

1. Implementation of the Eglin AFB ICRMP requires the avoidance of any NRHP-eligible or potentially NRHP-eligible sites. Therefore, impacts recorded on this table are based on the discovery of previously unrecorded cultural resources.
2. Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.4.2.2 Alternative 1 (Current Plus Future)

3.4.2.2.1 TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

The impacts to cultural resources under Alternative 1 for TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-81 are anticipated to be the same as impacts to these test areas under the No Action Alternative. In addition, any new construction, demolition, improvement, and maintenance activities will need to be evaluated if impacts are anticipated to NRHP-eligible cultural resources or structures.

3.4.2.2.2 TA A-73

No new groundbreaking activities or modification to NRHP structures are anticipated in TA A-73 under Alternative 1. Therefore, no impacts to cultural resource are anticipated beyond those indicated in the No Action Alternative.

Table 3-23. Potential Impacts on Cultural Resources from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	A/G Small Ordnance	Maintenance
A-73	-	0	-	-	0	-
A-77	0	0	0	0	0	0
A-78	0	0	0	0	0	0
A-79	-	0	-	0	0	-
A-90	0	0	0	0	0	0
B-7	0	0	0	0	0	0
B-12	-	-	-	0	0	-
B-70	-	-	-	0	-	-
B-71	-	-	-	0	-	-
B-75	0	0	0	0	0	0
B-82	-	-	-	0	-	-

A/G = air-to-ground; AFB = Air Force Base; ICRMP = Integrated Cultural Resource Management Plan; NRHP = National Register of Historic Places

Notes:

1. Implementation of the Eglin AFB ICRMP requires the avoidance of any NRHP-eligible or potentially NRHP-eligible sites. Therefore, impacts recorded on this table are based on the discovery of previously unrecorded cultural resources.
2. Description for symbols is provided in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.4.2.3 Cumulative Effects

Cultural resources are a finite record of the past. The more impacts from construction projects, human degradation, and environmental decay a resource endures, the less integrity it possesses. The NHPA is crucial to mitigating these effects through preservation and regulation of cultural resources. NRHP-eligible historic structures within Ranges A and B and elsewhere on the base benefit from NHPA regulations when a plan is implemented to avoid impacting or restoring historic structures. When construction plans avoid archeological sites and limit ground-disturbing activities inside sites, the cumulative effects are mitigated.

The Proposed Action within the test areas are anticipated to maintain the same level of cultural resource degradation or preservation as impacts from previous activities in the same test area. The key to preserving cultural resources at Eglin AFB is to identify any unknown cultural resources in non-surveyed test areas, to avoid known NRHP-eligible or potentially eligible cultural resource sites, and to maintain NRHP-eligible or potentially eligible structures. Current range uses in some test areas preclude the feasibility of cultural resource surveys where UXO is a safety concern. Any unknown cultural resources in these unsafe areas would be assumed to lose integrity due to the munitions impacts. NRHP-eligible structures or potentially eligible structures are anticipated to be maintained to preserve the eligibility status of the structures and any associated historic districts.

3.4.2.4 Management Actions

Management of cultural resources on Eglin AFB are directed by several documents and agreements regarding directed treatment of said resources. These include PAs and Memoranda of Agreement with the 96 TW, the 7th Special Forces Group (Airborne), the Joint Strike Fighter Program, the US Marine Corps, the Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer. These are referenced as the Base Realignment and Closure PA, Eglin CRM PA, and the US Marine Corps Memoranda of Agreement. There is also a DAF manual that addresses cultural resources (DAFMAN 32-7003, *Environmental Conservation*) and a base-level directive (EAFBMAN 13-212, *Range Planning and Operations*), as well as a binding internal document in the form of an ICRMP, that dictates certain policies and procedures. The following are policies and procedures for complying with cultural resources, laws, and regulations. Specific operating procedures can be found in the Eglin ICRMP and EAFBMAN 13-212, *Range Planning and Operations*:

- Areas marked or designated as by the Eglin Cultural Resource Office as sensitive will be avoided and designated as restricted access areas.
- All missions involving a use of land that has not been previously cleared by Eglin’s Cultural Resources Office for that same type of activity must be cleared through the Eglin Cultural Resources Office via the EIAP. This will usually entail the completion of AF Form 813 (Request for Environmental Impact Analysis). The EIAP office is the standard point of contact for information on how to fulfill this requirement.
- All historic properties (defined as historic buildings, historic or prehistoric structures, and/or archeological sites) will be avoided whenever possible in the course of any testing and training activity.
- Areas deemed high probability for containing cultural resources that have not yet been surveyed are not cleared by the Eglin Cultural Resources Office, and, therefore, are presently off-limits to all weapons testing and ground maneuvers.
- Range managers must, therefore, maintain regular dialogue with the Eglin Cultural Resources Office, access the Center Scheduling Enterprise, and employ the EIAP process to ensure required avoidance of protected cultural resources.
- If archeological deposits (buried architecture, features such as dense deposits of shell, or clusters of artifacts) are encountered on the ground in the course of any mission activity, all disturbance of the ground surface shall cease, and the discovery will be secured from further harm. The Eglin Cultural Resources Office shall be immediately informed of the discovery.

If human remains and/or funerary objects such as a coffin or complete, intact aboriginal pottery are discovered in the course of any mission activity, the following actions are to be taken:

- All disturbance of the ground surface in the area shall cease and the discovery will be secured from further harm until further notice.
- The Eglin Cultural Resources Office shall be immediately informed of the discovery.

3.5 GEOLOGY AND SOILS

Soils refer to unconsolidated materials formed from the breakdown of underlying bedrock or other parent material. Soil formation is an ongoing process that is determined by the nature of the parent material and environmental factors such as climate, geology, topography, and the effects of vegetation. Soils potentially impacted by the Proposed Action include terrestrial soils and aquatic sediments. Sediments generally refer to small, unconsolidated particles of rocks or other materials that have been transported from their original location. The delivery and deposition of sediment in waterways is known as sedimentation.

3.5.1 Affected Environment

This section describes the soil resources in the ROI that may be affected by the proposed activities. The ROI consists of the test areas and test sites identified in Chapter 2 (Alternatives Including the Proposed Action), and areas near but outside the test area/test site boundaries where soils could be indirectly affected (e.g., by erosion originating on a test area). The soils on Eglin AFB have developed from the Citronelle Formation as well as alluvium (gravel, sand, silt, and clay deposited by water) from the floodplains of lowland areas. The soils within Eglin AFB can be divided into series according to texture, slope, stoniness, salinity, wetness, degree of erosion potential, and other characteristics that affect their use (USDA, 1995). The test areas/test sites in the ROI are located within the Western Highland physiographic province, which generally consists of sand hills that range in elevation from 100 to 200 feet. Western Highland hills are typically cut by deep, narrow stream valleys.

Erosion would be the primary concern associated with proposed activities in the ROI. Soil erosion is the process of detachment, suspension, translocation, and deposition of surface materials by water, wind, ice, or gravity. Erosion can introduce sediments and pollutants into terrestrial and aquatic environments, damage or destroy cultural resources, reduce recreational use and value of affected watersheds, and increase land management and operating costs. Eroded soil particles moved and deposited by a watercourse (i.e., sediment), can adversely alter water quality, habitats, and the hydrologic form and function of waterways and wetlands. Suspended sediment in waterways inhibits light penetration and photosynthesis and diminishes the aesthetic value of water bodies. Sediment deposition in waterways leads to premature filling of water bodies, exertion of large oxygen demands on the water, covering of benthic aquatic habitats, and alteration of stream hydrology. Sediment deposition on terrestrial areas can cover and kill vegetation and other organisms such as small invertebrates. Erosion and sedimentation can also introduce organic matter and nutrients, pesticides, metals, and other compounds into receiving ecosystems.

Erosion caused by human activities may potentially occur at rates greater than those associated with natural conditions and can have detrimental effects on soils and ecosystems. The susceptibility of soil to erosion primarily depends on factors such as soil texture, moisture content, pH, and ionic strength of eroding water. The erosion potential generally declines with increases in the amount of clay and organic matter content. In contrast, uniform silts and sands tend to have a higher erosion probability. Slope angle and length are the primary topographic variables influencing erosion potential, particularly erosion caused by rain. Vegetation plays an important role in the interception and diffusion of water energy from rain splash and overland water flows.

Information on soils occurring in the ROI, including summary descriptions, slope (where applicable), and erosion factors, is provided in Table 3-24. Detailed soil descriptions are available in the *Soil Survey of Okaloosa County, Florida* (USDA, 1995). Slope gradients are generally evaluated in the context of specific land uses (e.g., agricultural fields and residential construction). However, overall, the US Geological Survey categorizes slopes as flat to gentle (0 to 5 percent); gentle to moderate (5 to 15 percent); moderate (15 to 25 percent); and steep (greater than 25 percent) (USGS, 1975). The erosion factor of each soil type is provided by the US Department of Agriculture as a "K factor," which indicates the susceptibility of the soil to water erosion based on the percentage of silt, sand, and organic matter, soil structure, and hydraulic conductivity (USDA, 2019). K values range from 0.02 for the least erodible soils to 0.69 for the most erodible. Generally, soils with K values below 0.2 are considered to have low erosion potential (Michigan State University, 2002). Soils occurring on test areas of the ROI are shown in Figure 3-8 to Figure 3-10.

Table 3-24. Soil Types in the Region of Influence

Soil Series	Description	Erosion Factor
Bonifay loamy sand, 0 to 5% slopes	Very deep, well-drained, moderately permeable soil. Rapid surface water runoff. Formed from sandy and loamy marine sediments. Occurs on broad, nearly level to sloping ridges and side slopes. Typically, dry during the summer.	0.10
Chipley and Hurricane soils, 0 to 5% slopes	Nearly level or gently sloping, somewhat poorly drained soil. Often occurs in upland drainageways and on low ridges of flatwoods. Rapid water permeability and low water capacity.	0.02
Dorovan muck, frequently flooded	Nearly level, very poorly drained soil that is organic throughout. Moderate permeability and high water capacity. Water table is usually near or above the surface. Often occurs in swamps and drainageways.	Not rated
Foxworth sand, 0 to 5% slopes	Nearly level or gently sloping, moderately well-drained soil. Usually occurs in uplands and elevated portions of flatwoods. Very rapid permeability and low water capacity. Runoff is very slow.	0.02
Lakeland sand, 0 to 5% slopes	Nearly level or gently sloping, excessively drained soil. Rapid water permeability. Predominantly sand to a depth of 80 inches or more. General lack of soil-forming processes. Erosion may be controlled by preserving existing vegetation cover and revegetating disturbed areas.	0.02
Lakeland sand, 5 to 12% slopes	Sloping or strongly sloping, excessively drained soil on upland slopes leading to drainageways. Rapid water permeability and very low water capacity. Predominantly sand to a depth of 80 inches or more. General lack of soil-forming processes. Erosion is a hazard in steeper areas and may be controlled by preserving existing vegetation cover and revegetating disturbed areas.	0.02

Table 3-24. Soil Types in the Region of Influence

Soil Series	Description	Erosion Factor
Lakeland sand, 12 to 30% slopes	Moderately steep or steep, excessively drained soil on upland slopes leading to drainageways. Rapid water permeability and very low water capacity. Predominantly sand to a depth of 80 inches or more. General lack of soil-forming processes. Disturbed soil is susceptible to erosion.	0.02
Leon sand, 0 to 2% slopes	Nearly level, poorly drained soil. Generally considered a wet soil, with the water table at a depth of less than 10 inches seasonally. Permeability is rapid in surface and subsurface layers, and moderate to moderately rapid in the subsoil. Water capacity is correspondingly very low in upper layers and low in subsurface layers.	0.05
Pactolus loamy sand, 0 to 5% slopes	Nearly level to gently sloping, very acidic, loamy soil. Moderately well to somewhat poorly drained. Rapid permeability and slow runoff.	0.05
Rutlege fine sand, depressional	Nearly level, very poorly drained soil. Rapidly permeable. Occurs in shallow depressional areas such as ponds, floodplains, and upland flats. Water table is at or near the surface for extended periods.	0.02
Rutlege loamy sand	Poorly drained, very acidic, clayey soil. Rapid permeability. Runoff is ponded or very slow. Occurs in floodplains, depressions, and upland flats.	0.05
Troup sand, 0 to 5% slopes	Nearly level or gently sloping, well-drained soil. Occurs on ridgetops in uplands. Permeability is rapid (upper part) to moderate (lower part). Water capacity low and runoff is slow. Erosion may be controlled by preserving existing vegetation cover and revegetating disturbed areas.	0.10
Troup sand, 8 to 12% slopes	Strongly sloping, well-drained soil that occurs in uplands. Permeability is rapid (upper part) to moderate (lower part). Water capacity low and runoff is slow.	0.10
Udorthents, nearly level	Consists of soils in areas of open excavations (e.g., for road repair or fill) from which sand and loamy materials have been removed. Includes variable mixtures of sand, loam, and clay.	0.15

% = percent

3.5.1.1 TA A-73

Lakeland sand is the only soil type present on TA A-73 (Table 3-25). As indicated by the low erosion factor (Table 3-24), Lakeland soils are relatively stable and not particularly prone to erosion under natural conditions (i.e., undisturbed and with intact vegetative cover). However, if disturbed or cleared of vegetation, these soils are susceptible to erosion because of the weak soil structure (low cohesion and aggregate stability), high sand content, low organic matter and clay content, and lack of soil-forming processes. Erosion potential increases with increasing slope angle. There are areas of substantial soil disturbance on TA A-73, particularly at the ground training area, and existing vegetation is maintained (e.g., bush hogging and herbicide control). Slopes are generally low, ranging from 0 to 5 percent.

Table 3-25. Soil Types Within TA A-73

Test Area	Soil Type	Approximate Acres
A-73	Lakeland sand, 0 to 5% slopes	610.4

% = percent; TA = Test Area

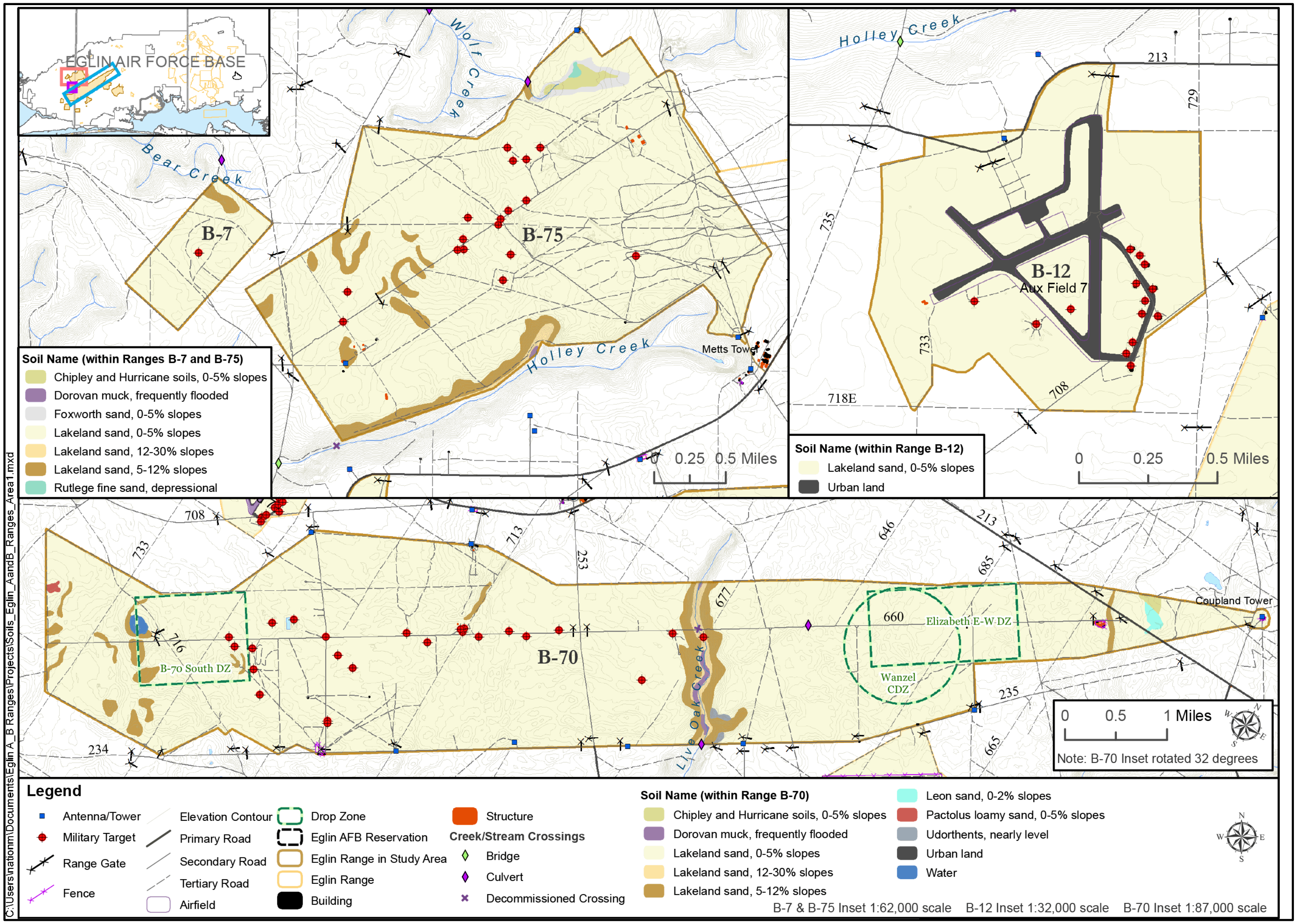
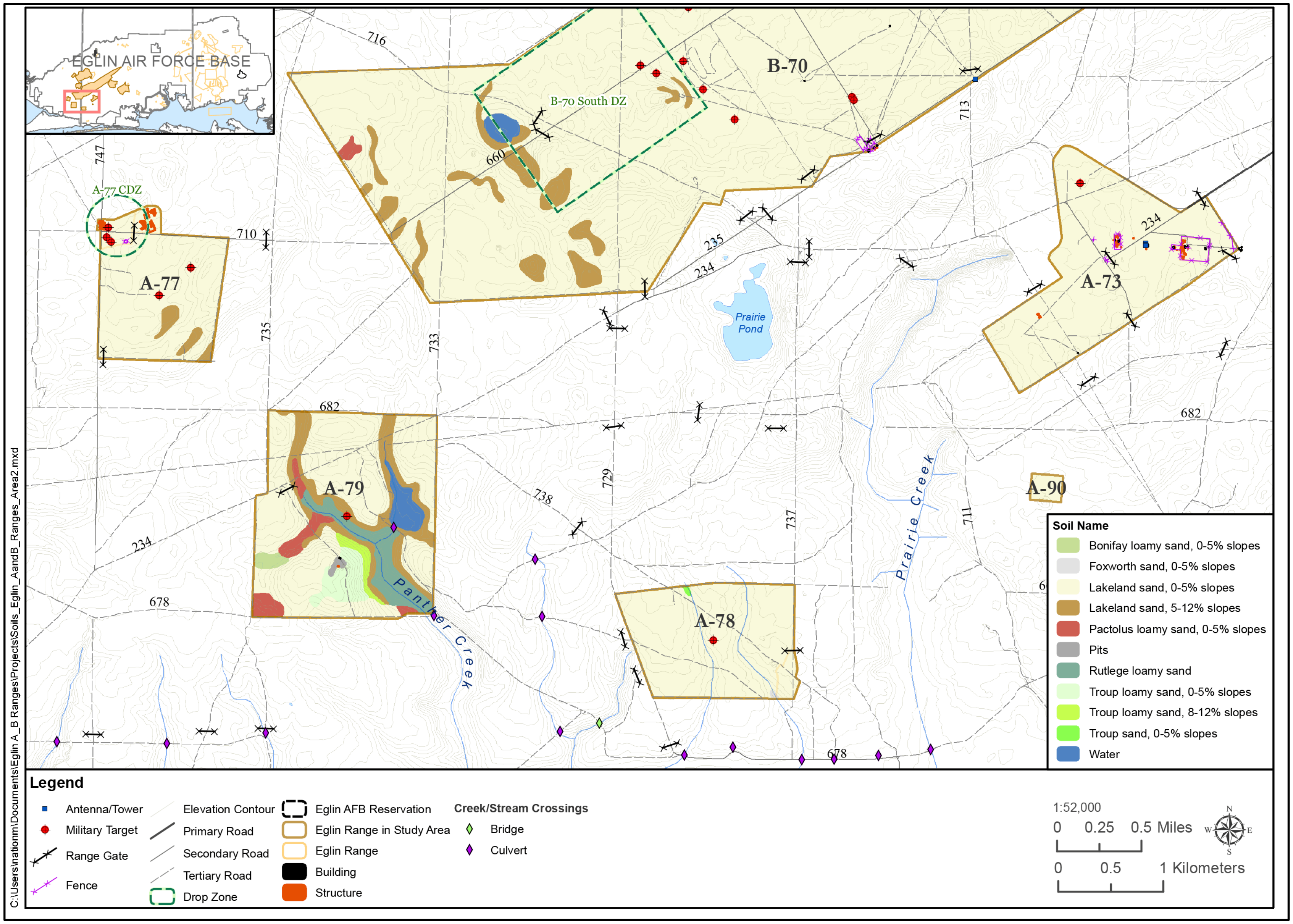


Figure 3-8. Soil Types at TAs B-7, B-12, B-70, and B-75



1

2 **Figure 3-9. Soil Types at TAs A-73, A-77, A-78, A-79, and A-90**

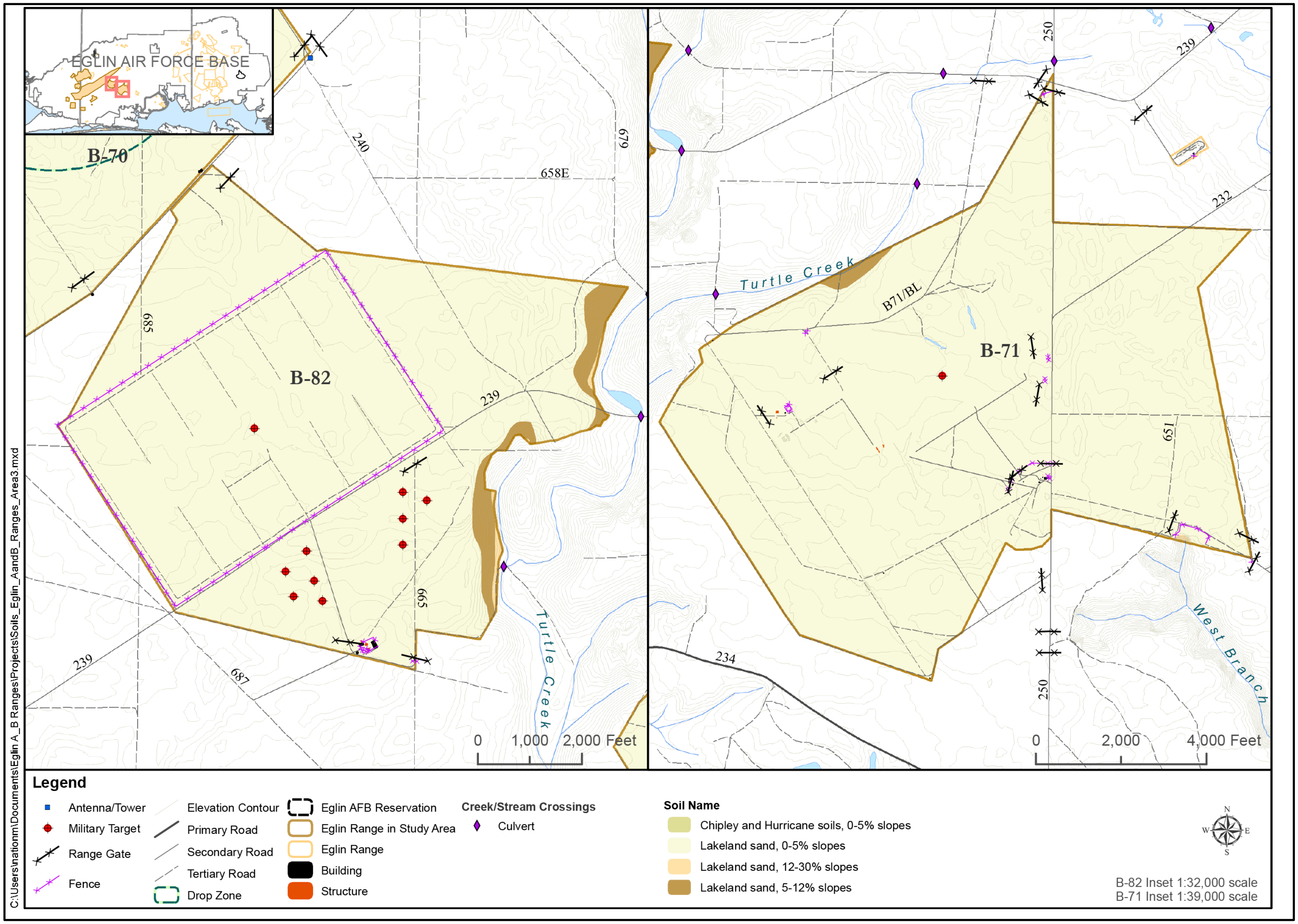


Figure 3-10. Soil Types at TAs B-71 and B-82

3.5.1.2 TA A-77

Lakeland sand is the only soil type present on TA A-77 (Table 3-26). As described for TA A-73, Lakeland soils are generally stable under natural conditions but are susceptible to erosion if disturbed or cleared of vegetation. Vegetation on the test area is maintained, and there are areas of substantial soil disturbance associated with targets. Slopes on most of the test area are low, ranging from 0 to 5 percent, but there are small areas with slopes of up to 12 percent.

Table 3-26. Soil Types Within TA A-77

Test Area	Soil Type	Approximate Acres
A-77	Lakeland sand, 0 to 5% slopes	349.8
A-77	Lakeland sand, 5 to 12% slopes	19.7

% = percent; TA = Test Area

3.5.1.3 TA A-78

Nearly all the soil on TA A-78 is Lakeland sand (0 to 5 percent slope) (Table 3-27). Additional soil types consist of Troup sand and Foxworth sand, both of which also have slopes of 0 to 5 percent. Vegetation on the test area is maintained, and there are areas of substantial soil disturbance associated with targets and the simulated village facility.

Table 3-27. Soil Types Within TA A-78

Test Area	Soil Type	Approximate Acres
A-78	Lakeland sand, 0 to 5% slopes	405.5
A-78	Troup sand, 0 to 5% slopes	1.3
A-78	Foxworth sand, 0 to 5% slopes	1.3

% = percent; TA = Test Area

3.5.1.4 TA A-79

Most soil on TA A-79 is Lakeland sand of variable slope gradients (Table 3-28). Additional soil consists of various types of loamy sands associated with the slopes of Panther Creek and its tributary. Topography is steepest adjacent to these streams. The test area is currently inactive and, except for a clay/sand borrow pit, vegetation is similar to that of adjacent unmaintained areas. Aerial imagery suggests there could be a small amount of erosional soil transport away from the borrow pit area.

Table 3-28. Soil Types Within TA A-79

Test Area	Soil Type	Approximate Acres
A-79	Lakeland sand, 0 to 5% slopes	479.0
A-79	Lakeland sand, 5 to 12% slopes	115.2
A-79	Rutlege loamy sand	72.9
A-79	Pactolus loamy sand, 0 to 5% slopes	40.7
A-79	Troup loamy sand, 0 to 5% slopes	40.6
A-79	Troup loamy sand, 8 to 12% slopes	14.0
A-79	Bonifay loamy sand, 0 to 5% slopes	10.1

Table 3-28. Soil Types Within TA A-79

Test Area	Soil Type	Approximate Acres
A-79	Borrow Pit	4.0
A-79	Water	28.7

% = percent; TA = Test Area

3.5.1.5 TA A-90

Lakeland sand (0 to 5 percent slopes) is the only soil type present on TA A-90 (Table 3-29). Vegetation on the test area is maintained, and there are cleared maneuver and administrative areas and earthen berms.

Table 3-29. Soil Types Within TA A-90

Test Area	Soil Type	Approximate Acres
A-78	Lakeland sand, 0 to 5% slopes	18.5

% = percent; TA = Test Area

3.5.1.6 TA B-7

Lakeland sand is the only soil type present on TA B-7 (Table 3-30). Vegetation on the test area is maintained, and there are areas of substantial soil disturbance associated with targets. Slopes on most of the test area are low, ranging from 0 to 5 percent, but a small area with slopes of up to 12 percent occurs in the northern portion, near Bear Creek.

Table 3-30. Soil Types Within TA B-7

Test Area	Soil Type	Approximate Acres
B-7	Lakeland sand, 0 to 5% slopes	303.2
B-7	Lakeland sand, 5 to 12% slopes	13.5

% = percent; TA = Test Area

3.5.1.7 TA B-12

Soils on TA B-12 consist of Lakeland sand (0 to 5 percent slope) and paved runway areas (categorized as urban land) (Table 3-31). Natural to semi-natural vegetation conditions occur on most of the test area, with maintained vegetation along the runways. However, disturbed ground and exposed soil is present at target areas.

Table 3-31. Soil Types Within TA B-12

Test Area	Soil Type	Approximate Acres
B-12	Lakeland sand, 0 to 5% slopes	605.2
B-12	Urban land	79.8

% = percent; TA = Test Area

3.5.1.8 TA B-70

Most soil on TA B-70 is Lakeland sand of variable slope gradients, primarily 0 to 5 percent (Table 3-32). Lakeland sands with slopes of greater than 5 percent mostly occur adjacent to Live Oak Creek and near wetlands on the eastern and western portions of the test area. Additional soil types, which also occur near Live Oak Creek and wetlands, consist of Dorovan muck, Leon sand, Chipley and Hurricane soils, Udorthents, and Pactolus loamy sand. These soils represent less than 1 percent of soils on the test area. Vegetation on most of TA B-70 is maintained, and there are areas of sparse vegetation and exposed soil.

Table 3-32. Soil Types Within TA B-70

Test Area	Soil Type	Approximate Acres
B-70	Lakeland sand, 0 to 5% slopes	10,204.7
B-70	Lakeland sand, 5 to 12% slopes	412.6
B-70	Lakeland sand, 12 to 30% slopes	71.8
B-70	Dorovan muck, frequently flooded	24.4
B-70	Leon sand, 0 to 2% slopes	18.8
B-70	Chipley and Hurricane soils, 0 to 5% slopes	14.4
B-70	Udorthents, nearly level	12.7
B-70	Pactolus loamy sand, 0 to 5% slopes	7.4
B-70	Water	17.8

% = percent; TA = Test Area

3.5.1.9 TA B-71

Soils on TA B-71 consist almost entirely of Lakeland sand of variable slope gradients, primarily 0 to 5 percent (Table 3-33). Udorthents and Chipley and Hurricane soils occur in negligible amounts. Lakeland sand with slope gradients of more than 5% percent occur along the northern and southeastern test area boundaries in association with Turtle Creek and West Branch, respectively. Existing vegetation is maintained, and there are areas of sparse vegetation and exposed soil. Stormwater runoff from the asphalt grid is conveyed through two concrete drainways (Eglin AFB, 2010a). Erosion along the perimeter road has been substantial in the past, limiting access to four-wheel drive vehicles in some areas. However, Eglin has addressed the erosion through road upgrades.

Table 3-33. Soil Types Within TA B-71

Test Area	Soil Type	Approximate Acres
B-71	Lakeland sand, 0 to 5% slopes	2,288.2
B-71	Lakeland sand, 5 to 12% slopes	11.1
B-71	Lakeland sand, 12 to 30% slopes	1.0
B-71	Udorthents, nearly level	0.1
B-71	Chipley and Hurricane soils, 0 to 5% slopes	0.1

% = percent; TA = Test Area

3.5.1.10 TA B-75

Most soil on TA B-75 is Lakeland sand of variable slope gradients, primarily 0 to 5 percent (Table 3-34). Lakeland sands with slopes of greater than 5% percent occur along the southwestern test area boundary in association with Holley Creek, in small areas on the western part of the test area, and in association with wetlands along Wolf Creek. Additional soil types consist of Foxworth sand, Chipley and Hurricane soils, Rutlege fine sand, and Dorovan muck. Various concrete, asphalt, and clay pads are constructed in various areas. Existing vegetation is maintained, and there are areas of sparse vegetation and exposed soil. Topography is generally characterized as gently rolling hills with ridges, terraces, and basins (Eglin AFB, 2010b). Erosion has previously been noted on portions of the test area, resulting in steeper and shorter slopes of up to 20 percent. Severe erosion has occurred on the slopes of Lakeland sands, along roads, and in watershed areas that outfall into adjacent streams.

Table 3-34. Soil Types Within TA B-75

Test Area	Soil Type	Approximate Acres
B-75	Lakeland sand, 0 to 5% slopes	3,322.0
B-75	Lakeland sand, 5 to 12% slopes	188.3
B-75	Lakeland sand, 12 to 30% slopes	18.2
B-75	Foxworth sand, 0 to 5% slopes	35.1
B-75	Chipley and Hurricane soils, 0 to 5% slopes	24.1
B-75	Rutlege fine sand, depressional	3.4
B-75	Dorovan muck, frequently flooded	1.8

% = percent; TA = Test Area

3.5.1.11 TA B-82

Soils on TA B-82 consist almost entirely of Lakeland sand of variable slope gradients, primarily 0 to 5 percent (Table 3-35). Dorovan muck Chipley and Hurricane soils occur in negligible amounts. Lakeland sand with slope gradients of more than 5% percent occur along portions of the eastern test area boundary in association with Turtle Creek. Existing vegetation is maintained, and there are areas of sparse vegetation and exposed soil, particularly within the central target area/clay DZ. The sparsely vegetated clay zone is susceptible to erosion. Previously, erosion from the center of the zone in several directions has been noted, but vegetation is thicker along the perimeter of the test area and signs of erosion were not readily apparent (Eglin AFB, 2007).

Table 3-35. Soil Types Within TA B-82

Test Area	Soil Type	Approximate Acres
B-82	Lakeland sand, 0 to 5% slopes	1,388.1
B-82	Lakeland sand, 5 to 12% slopes	44.2
B-82	Lakeland sand, 12 to 30% slopes	5.4
B-82	Dorovan muck, frequently flooded	0.1

% = percent; TA = Test Area

3.5.1.12 Summary of Potentially Affected Resources

Lakeland sands, particularly sands with 0 to 5 percent slope, are the predominant soils on test areas of the ROI. Overall, as indicated in Table 3-24, the erosion potential for soils in the ROI is low under natural conditions because Lakeland soils are relatively stable and typically not prone to erosion if undisturbed and covered with vegetation. Increased erosion potential is associated with relatively small areas of steeper slopes, particularly near streams and wetlands, and disturbed areas around targets and other heavily used locations.

3.5.2 Environmental Consequences

Soil types and physical properties were considered to determine the potential for soil erosion that could occur from ground-disturbing activities such as troop movements, vehicle movements, and vessel launch/retrieval. If activities were to occur in an area where there is high potential for soil loss or erosion, off-site sediment transport could occur and alter water quality, aquatic habitats, and hydrologic characteristics of streams and wetlands, and increase flooding. Once erosion has occurred, it can lead to increased land management and operating costs. Erosion can also transport chemical contaminants that may be attached to sediment particles. Soil types, land contours, and surface water features located on and near the proposed sites were identified and mapped using geospatial information.

An impact would be considered significant if it would cause (1) long-term physical alteration of structural or chemical soil properties, or (2) erosion that could alter hydrology or degrade water quality or aquatic habitats. Structure refers to the way in which individual soil particles are physically arranged, which influences the soil's water permeability and ability to support vegetation. Examples of changes to soil structure are compaction and rutting, which may be caused by activities such as troop movement, vehicle operation, and boat landings. Chemical properties may be affected by the introduction of materials such as explosives, metals, and petroleum products. Erosion may be caused by ground-disturbing activities including training, testing, and maintenance activities. Significant erosion effects would consist of those potentially causing water quality standards to fall below levels required by Section 303 of the Clean Water Act, result in noncompliance with executive orders related to wetlands and floodplains, or result in failure to meet the requirements of the CZMA.

The level of impact associated with the proposed activities and the impact's potential significance is determined by considering how Proposed Action effectors could interact with geology and soil resources in terms of context, intensity, and duration.

Context for geological resources may be:

- Localized, with impacts to soil stability
- Regional, with waterway or groundwater impacts

Intensity can be either adverse or beneficial, and may be:

- Low, with no management requirements needed, and unavoidable adverse impacts recoverable through natural processes
- Medium, with potential need for management requirements to avoid adverse impacts, and unavoidable adverse impacts likely recoverable with BMPs and management requirements
- High, with management requirements necessary to minimize or avoid adverse impacts, and unavoidable adverse effects that may not be recoverable

Duration may be:

- Short term, with an effect that would likely last for a few days to weeks
- Medium term, with an effect that would likely last for a few months to a year
- Long term, with an effect that would likely endure for the life of the action

To summarize the analysis presented in this section for geology and soils, Table 3-36, Table 3-37, and Table 3-38 show the potential impacts for the No Action Alternative and Alternative 1.

3.5.2.1 No Action Alternative

Under the No Action Alternative, there would be no significant issues/impacts anticipated in relation to geology and soils. The management of erosion on test areas within the study area would continue to be conducted in accordance with all applicable environmental compliance regulations and Eglin environmental management plans, as described for each test area below.

If Proposed Action activities such as ordnance use would result in significant chemical releases that may impact soils, additional procedures or waste control measures could be required. Activities that cause or exacerbate erosion would also likely require preventative measures. There are no new activities under the No Action Alternative.

Some mission activities, such as dismounted maneuver, wheeled and tracked vehicles, and heavy equipment would, under normal circumstances, may have some effect with regard to erosion. There is a remote potential that, during training, vehicles could leak petroleum, oil, and lubricants or be involved in an accident that results in a spill of these materials which may travel through soils to surface or groundwater sources.

3.5.2.1.1 TA A-73

No significant impacts to geological or soil resources are anticipated from continued operations at TA A-73. The primary soil type is the Lakeland Sand soil series. Activities that can contribute to the initiation or acceleration of soil erosion on this range include range maintenance, improper road maintenance, and improper vegetation control techniques. The effects of these activities can be particularly pronounced on sloped areas. As the test area is partially developed with paved areas and forested with mature longleaf pines, the risk for erosion is minor.

Also, the test area is primarily a radar test site with limited ground training, the risk for erosion is minor. No munitions are expended on this test site. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil. No adverse impacts are anticipated to the underlying geology of the area.

3.5.2.1.2 TA A-77

No significant impacts are anticipated to soils or geological resources. Testing and training activities at TA A-77 may affect soils by deposition of munitions residue and erosion. Potential munitions impact to soils pertain to substances that can be released into the ground as a result of mission activities.

3.5.2.1.3 TA A-78

No significant impacts are anticipated to soils or geological resources. Testing and training activities at TA A-78 may affect soils by deposition of munitions residue and erosion. Potential munitions impact to soils pertain to substances that can be released into the ground as a result of mission activities. Examples of such substances include lead and copper. Chemical substances absorbed into the soil may eventually be released into groundwater and surface waters. Munitions use, including bomb and small arms expenditures and associated ordnance retrieval, may initiate or accelerate erosion in sloped areas with reduced vegetative cover. The management requirements can substantially decrease erosion and chemical impacts to soils at TA A-78. In addition, under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFMAN 13-212 and EAFBMAN 13-212, which require the range to be cleared of munitions debris regularly. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil.

Potential impacts associated with munitions residue pertain to chemical materials that can be released into the ground because of mission activities. Degradation of ordnance materials may produce chemical by-products that, under certain concentrations, may become an environmental concern. Once chemical substances are absorbed into the soils, they may be subsequently transported to groundwater and surface waters and, therefore, have the potential to affect water quality.

Although munitions use may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA thresholds. Munitions expenditures, vehicle operations, and foot traffic could contribute to soil erosion. These impacts would be diminished by implementing management requirements (DAF, 2011a).

Ordnance and Vehicles

- All weapons, including practice bombs with spotting charge, on or near the surface must be recovered, removed, and destroyed.

Soil Resources

- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Design concave slope segments on newly constructed targets.
- Monitoring of the test area, if conducted, should include chemical analysis of soils.

3.5.2.1.4 TA A-79

No significant impacts to geological or soil resources are anticipated from continued operations at TA A-79. Activities that can contribute to the initiation or acceleration of soil erosion on this range include range maintenance, improper road maintenance, and improper vegetation control techniques. The effects of these activities can be particularly pronounced on sloped areas. As the test area is a borrow pit, the risk for erosion is minor. No munitions are expended on this test site. Any future development activities have potential to modify the terrain such that BMPs may be required. No adverse impacts are anticipated to the underlying geology of the area.

3.5.2.1.5 TA A-90

No significant impacts to geological or soil resources are anticipated from continued operations at TA A-90. Activities that can contribute to the initiation or acceleration of soil erosion on this range include range maintenance, improper road maintenance, and improper vegetation control techniques. The effects of these activities can be particularly pronounced on sloped areas. As the test area is cleared, the risk for erosion is minor. No heavy munitions are expended on this test site. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil. No adverse impacts are anticipated to the underlying geology of the area.

3.5.2.1.6 TA B-7

No significant impacts are anticipated to soils or geological resources. Testing and training activities at TA B-7 may affect soils by deposition of munitions residue and erosion. Potential munitions impacts to soils pertain to substances that can be released into the ground as a result of mission activities. Examples of such substances include lead and copper. Chemical substances absorbed into the soil may eventually be released into groundwater and surface waters. Munitions use, including bomb and small arms expenditures and associated ordnance retrieval, may initiate or accelerate erosion in sloped areas with reduced vegetative cover. The management requirements can substantially decrease erosion and chemical impacts to soils at TA B-7. In addition, under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFMAN 13-212 and EAFBMAN 13-212, which require the range to be cleared of munitions debris regularly. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil.

Potential impacts associated with munitions residue pertain to chemical materials that can be released into the ground because of mission activities. Degradation of ordnance materials may produce chemical by-products that, under certain concentrations, may become an environmental concern. Once chemical substances are absorbed into the soils, they may be subsequently transported to groundwater and surface waters and, therefore, have the potential to affect water quality.

Although munitions use may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA thresholds. Munitions expenditures, vehicle operations, and foot traffic could contribute to soil erosion. These impacts would be diminished by implementing management requirements (DAF, 2011a).

Ordnance and Vehicles

- All inert weapons, including practice bombs with spotting charge, on or near the surface must be recovered, removed, and destroyed.
- Tactical vehicles must be moved only on established range roads.

Soil Resources

- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Control the location and design of mission activities to avoid creating adverse slope shapes or gradients and/or to reduce vegetative cover.
- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Establish low-growing grassland communities on severely disturbed erosion response units.
- Design concave slope segments on newly constructed targets.
- Reduce the gradients of severely eroding slopes to the degree possible and revegetate.
- Monitoring of the test area, if conducted, should include chemical analysis of soils.

3.5.2.1.7 TA B-12

No significant impacts are anticipated to soils or geological resources. Testing and training activities at TA B-12 may affect soils by deposition of munitions residue and erosion. Potential munitions impacts to soils pertain to substances that can be released into the ground as a result of mission activities. Examples of such substances include lead and copper. Chemical substances absorbed into the soil may eventually be released into groundwater and surface waters.

Munitions use, including bomb and small arms expenditures and associated ordnance retrieval, may initiate or accelerate erosion in sloped areas with reduced vegetative cover. The management requirements can substantially decrease erosion and chemical impacts to soils at TA B-12. In addition, under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFMAN 13-212 and EAFBMAN 13-212, which require the range to be cleared of munitions debris regularly. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil.

Potential impacts associated with munitions residue pertain to chemical materials that can be released into the ground because of mission activities. Degradation of ordnance materials may produce chemical by-products that, under certain concentrations, may become an environmental concern. Once chemical substances are absorbed into the soils, they may be subsequently transported to groundwater and surface waters and, therefore, have the potential to affect water quality.

Although munitions use may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA thresholds. Munitions expenditures, vehicle operations, and foot traffic could contribute to soil erosion. These impacts would be diminished by implementing management requirements (DAF, 2011a).

Ordnance and Vehicles

- All weapons, including practice bombs with spotting charge, on or near the surface must be recovered, removed, and destroyed.

Soil Resources

- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Design concave slope segments on newly constructed targets.
- Monitoring of the test area, if conducted, should include chemical analysis of soils.

3.5.2.1.8 TA B-70

Soils would not be significantly impacted under the No Action Alternative. The potential for erosion is slight, and the risk from chemical materials is minor. The dominant soil types within the TA B-70 fall within the Lakeland ecological association, which are rapid draining and are relatively stable and not prone to erosion if covered with vegetation. Ongoing activities are not expected to create a significant risk for erosion. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil. No adverse impacts are anticipated to the underlying geology of the area.

The main issue of concern for soils is the transport of chemical materials through soils into nearby waterways or to groundwater sources. The potential exists for chemical materials to migrate into surface waters from erosion of soil or into groundwater via downward migration through permeable sands. Chemical materials leached into groundwater may eventually reach surface waters. It is not expected that the chemical constituents released into the environment would exceed threshold amounts. Soil-stabilizing vegetation around proposed testing areas may limit the transport of munitions components via erosion into surrounding surface waters.

The potential for metals and explosives to leach contaminants through the soil column depends on many physical and chemical properties of the metals, the soil, and climate. However, potential impacts to water quality could be reduced by implementation of test area sustainability practices and procedures. Use of the following practices and procedures would serve to reduce the potential for runoff from munitions to impact water quality:

- Proactive monitoring for potential migration of metals
- Runoff control using vegetative groundcover, mulches and compost, surface covers, and engineered runoff controls
- Provision for testing areas to be scanned for debris and have dudded munitions removed

3.5.2.1.9 TA B-71

Soils would not be significantly impacted under the No Action Alternative. The potential for erosion is slight, and the risk from chemical materials is minor. The dominant soil types within the TA B-71 are well drained and are relatively stable and not prone to erosion if covered with vegetation. Ongoing activities are not expected to create a significant risk for erosion. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil. No adverse impacts are anticipated to the underlying geology of the area.

The main issue of concern for soils is the transport of chemical materials through soils into nearby waterways or to groundwater sources. The potential exists for chemical materials to migrate into surface waters from erosion of soil or into groundwater via downward migration through permeable sands. Chemical materials leached into groundwater may eventually reach surface waters. It is not expected that the chemical constituents released into the environment would exceed threshold amounts. Soil-stabilizing vegetation around proposed testing areas may limit the transport of munitions components via erosion into surrounding surface waters.

The potential for metals and explosives to leach contaminants through the soil column depends on many physical and chemical properties of the metals, the soil, and climate. However, potential impacts to water quality could be reduced by implementation of test area sustainability practices and procedures. Use of the following practices and procedures would serve to reduce the potential for runoff from munitions to impact water quality:

- Proactive monitoring for potential migration of metals

- Runoff control using vegetative groundcover, mulches and compost, surface covers, and engineered runoff controls
- Provision for testing areas to be scanned for debris and have dudded munitions removed

3.5.2.1.10 TA B-75

Soils would not be significantly impacted under the No Action Alternative. The potential for erosion is slight, and the risk from chemical materials is minor. The dominant soil types within TA B-75 fall within the Lakeland ecological association. In terms of soil coverage under this alternative, these soils are rapid draining which under normal conditions, these soils are relatively stable and not prone to erosion if covered with vegetation. Ongoing activities are not expected to create a significant risk for erosion. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil. No adverse impacts are anticipated to the underlying geology of the area.

The main issue of concern for soils is the transport of chemical materials through soils into nearby waterways or to groundwater sources. The potential exists for chemical materials to migrate into surface waters from erosion of soil or into groundwater via downward migration through permeable Lakeland sands. Chemical materials leached into groundwater may eventually reach surface waters. It is not expected that the chemical constituents released into the environment would exceed threshold amounts. Soil-stabilizing vegetation around activity areas may limit the transport of munitions components via erosion into surrounding surface waters.

The potential for metals and explosives to leach contaminants through the soil column depends on many physical and chemical properties of the metals, the soil, and climate. However, potential impacts to water quality could be reduced by implementation of test area sustainability practices and procedures. Use of the following practices and procedures would serve to reduce the potential for runoff from munitions to impact water quality:

- Proactive monitoring for potential migration of metals
- Runoff control through the use of vegetative groundcover, mulches and compost, surface covers, and engineered runoff controls
- Provision for testing areas to be scanned for debris and have dudded munitions removed

3.5.2.1.11 TA B-82

No significant impacts are anticipated to soils or geological resources. Testing and training activities at TA B-82 may affect soils by deposition of munitions residue and erosion. Potential munitions impacts to soils pertain to substances that can be released into the ground as a result of mission activities. Examples of such substances include lead and copper. Chemical substances absorbed into the soil may eventually be released into groundwater and surface waters. Munitions use, including bomb and small arms expenditures and associated ordnance retrieval, may initiate or accelerate erosion in sloped areas with reduced vegetative cover. The management requirements can substantially decrease erosion and chemical impacts to soils at TA B-82. In addition, under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFMAN 13-212 and EAFBMAN 13-212, which require the range to be cleared of munitions debris regularly. Any future land clearing and construction activities have potential to modify the terrain such that BMPs would be required to minimize potential adverse impacts from loss of soil.

Potential impacts associated with munitions residue pertain to chemical materials that can be released into the ground because of mission activities. Degradation of ordnance materials may produce chemical by-products that, under certain concentrations, may become an environmental concern. Once chemical substances are absorbed into the soils, they may be subsequently transported to groundwater and surface waters and, therefore, have the potential to affect water quality.

Although munitions use may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA thresholds. Munitions expenditures, vehicle operations, and foot traffic could contribute to soil erosion. These impacts would be diminished by implementing management requirements (DAF, 2011a).

Ordnance and Vehicles

- All weapons, including practice bombs with spotting charge, on or near the surface must be recovered, removed, and destroyed.

Soil Resources

- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Design concave slope segments on newly constructed targets.
- Monitoring of the test area, if conducted, should include chemical analysis of soils.

Table 3-36. Potential Impacts on Geology and Soils from Testing and Training Activities Under the No Action Alternative

Test Area	Large Ordnance	Large Cartridge	Medium Cartridge	Small Cartridge	Mines	Grenade	Simulators	C-4	Rocket/Missile	Smoke/Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator
A-73	0	0	-	0	0	0	0	0	0	0	0
A-77	-	-	-	-	0	-	-	0	-	0	0
A-78	-	-	-	-	0	0	-	0	-	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	0	0	0	0	0
B-7	-	-	-	-	0	0	0	0	0	0	0
B-12	0	0	0	-	0	-	-	0	0	0	-
B-70	-	-	-	-	-	0	-	-	-	0	-
B-71	-	0	0	0	0	-	0	-	0	0	-
B-75	0	-	-	-	0	-	0	-	-	0	-
B-82	-	0	0	0	0	0	0	-	0	0	-

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Table 3-37. Potential Impacts on Geology and Soils from Test Area and Road Maintenance Associated With Each Test Area Under the No Action Alternative

Test Area	Fixed- and Rotary-Wing Aircraft	Detonation Cord/C-4	Herbicides	Dismounted Maneuver	Wheeled Vehicles	Wheeled Heavy Equipment	Tracked Heavy Equipment	Generators/Small Equipment	Point Impact—Land Disturbance	Incidental Surface Disturbance	Land Clearing	Plowing and Earth Moving	Culvert/Bridge/Ford Materials	Fill Dirt	Chainsaw/Tree Cutter	Biological Controls
A-73	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
A-77	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
A-78	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
A-79	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
A-90	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
B-7	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
B-12	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
B-70	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
B-71	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
B-75	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0
B-82	0	-	-	-	0	0	0	-	-	-	-	-	0	-	0	0

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.5.2.2 Alternative 1 (Current Plus Future)

3.5.2.2.1 TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Under Alternative 1 which includes current plus proposed activities, the ongoing activities described under the No Action Alternative would not significantly impact soil or geological resources. There are no major construction projects planned for these test areas. It is anticipated that there could be occasional minor construction, either facility, target structure, or land clearing under Alternative 1.

Test area and road maintenance under Alternative 1 would be the same as for the No Action Alternative. Maintenance actions would potentially include routine retrieval and disposal of UXO and range debris, clearance activities, target management, vegetation management, and maintenance of range access/control infrastructure.

Alternative 1 includes typical minor future construction, demolition, renovation, and facility modifications that could potentially occur over the next 7 years. These activities would be located within existing range profiles, and all management actions described in this EA would be followed (refer to Section 3.5.2.4, Management Actions). These types of actions would be reviewed for environmental concerns through the EIAP using AF Form 813 (Request for Environmental Impact Analysis).

Training, ordnance use, fixed-wing and rotary-wing aircraft, road and test area maintenance, debris cleanup, and vegetation control activities would be conducted in accordance with established procedures in currently approved areas only. Land clearance, construction, or renovation activities would require adherence to current regulations, including an NPDES permit to any proposed ground disturbance over 1 acre. Test area and road maintenance activities are conducted in accordance with base BMPs on a quarterly basis and include road grading, target replacement, and mowing.

3.5.2.2.2 TA A-73

Under Alternative 1 which includes current plus proposed activities, the ongoing activities described under the No Action Alternative would not significantly impact soil or geological resources. There are no major construction projects planned for these test areas. It is anticipated that there could be occasional minor construction, either facility, target structure, or land clearing under Alternative 1.

In addition to expenditures identified under the No Action Alternative (shown in Table 2-2), Alternative 1 evaluates authorizing two new radar systems. Potential impacts to geology and soils would be similar to those addressed in the EMR EA (DAF, 2017a). There are no major construction projects planned for the test areas addressed in this EA. It is anticipated that there could be occasional minor construction, either facility, target structure, or land clearing under Alternative 1. These include typical minor future construction, demolition, renovation, and facility modifications that could potentially occur over the next 7 years. These activities would be located within existing range profiles, and all management actions described in this EA would be followed (refer to Section 3.5.2.4, Management Actions). These types of actions would be reviewed for environmental concerns through the EIAP using AF Form 813 (Request for Environmental Impact Analysis).

Test area and road maintenance under Alternative 1 would be the same as for the No Action Alternative. Maintenance actions would potentially include routine retrieval and disposal of UXO and range debris, clearance activities, target management, vegetation management, and maintenance of range access/control infrastructure.

Training, road and test area maintenance, debris cleanup, and vegetation control activities would be conducted in accordance with established procedures in currently approved areas only. Land-clearance, construction, or renovation activities on structures would require adherence to current regulations, including an NPDES permit to any proposed ground disturbance over 1 acre. Test area and road maintenance activities are conducted in accordance with base BMPs on a quarterly basis and include road grading, target replacement, and mowing.

Table 3-38. Potential Impacts on Geology and Soils from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	Air-to-Ground Small Ordnance
A-73	-	0	-	-	0
A-77	-	0	-	0	0
A-78	-	0	-	0	0
A-79	-	0	-	0	0
A-90	-	0	-	0	0
B-7	-	0	-	0	0
B-12	-	0	-	0	0
B-70	-	-	-	0	0
B-71	-	0	-	0	0
B-75	-	-	-	0	0
B-82	-	0	-	0	0

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.5.2.3 Cumulative Effects

Long-term and intermittent cumulative impacts on soils would be expected from other testing and training activities, maintenance and repair activities, construction projects, and ground disturbance associated with other impacts such as stormwater runoff. These activities, particularly ground test and training operations and road and stream crossing maintenance would result in long-term cumulative soil disturbance that could cause erosion with the potential to degrade soil's physical structure and quality and adversely impact surface waters and wetlands. Past development throughout Eglin AFB has likely also contributed to erosion and soil loss; however, the extent to which this has occurred is difficult to determine. Although soils would be disturbed by testing and training activities and routine maintenance and repair activities, significant cumulative impacts are not expected due to implementation of management practices.

3.5.2.4 Management Actions

- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Control the location and design of mission activities to avoid creating adverse slope shapes or gradients and/or to reduce vegetative cover.

- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Establish low-growing grassland communities on severely disturbed erosion response units.
- Design concave slope segments on newly constructed targets.
- Reduce the gradients of severely eroding slopes to the degree possible and revegetate.

3.6 HAZARDOUS MATERIALS/WASTE AND DEBRIS

Hazardous Materials/Waste

Chemical materials encompass liquid, solid, or gaseous substances that are released to the environment as a result of mission activities and/or maintenance activities. These substances may include hazardous materials and hazardous wastes, although not all chemicals potentially released would be considered hazardous. Hazardous materials listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA) are defined as any substances that, due to quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Hazardous wastes listed under the Resource Conservation and Recovery Act (RCRA) are defined as a "solid waste" (which can be solid, semi solid, liquid, or contained gaseous material) that is either a "listed" hazardous waste, or is characteristically hazardous, and is not excluded from RCRA regulations. Hazardous wastes pose a substantive present or potential hazard to health, safety, or the environment. Hazardous wastes as referenced here pertain to mission-related hazardous chemicals or substances meeting the requirements found in 40 CFR 261.21–24, are regulated under RCRA, and are guided by DAFMAN 32-7002, *Environmental Compliance and Pollution Prevention*.

AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the DAF. All Eglin organizations and tenants are required to follow these instructions. In addition, Eglin has implemented a *U.S. Air Force Hazardous Waste Management Plan* (DAF, 2019c). This plan identifies hazardous waste generation areas and addresses proper packaging, labeling, storage and handling, record keeping, spill contingency and response requirements, and education. Procedures and responsibilities for responding to a hazardous waste spill or other incident are also described in the Eglin *Final Spill Prevention, Control, and Countermeasures Plan Update* (DAF, 2019d).

Releases to the environment from munitions utilized in proficiency and qualification training require reporting to USEPA under the EPCRA Toxic Release Inventory (TRI) program. Training is subject to a TRI reporting threshold of 10,000 pounds per year for most common chemicals, with lower reporting thresholds for chemicals classified as "persistent bioaccumulative toxic." These chemicals include mercury, with a reporting threshold of 10 pounds, and lead, with a threshold of 100 pounds. In cases where a threshold is exceeded, the installation must report on a "Form R" to USEPA the quantity of munitions-related waste released to the environment or recovered and recycled.

Special Hazards

Special hazards are those substances that might pose a risk to human health and are addressed separately from hazardous materials and hazardous wastes. Special hazards include asbestos-containing material (ACM), lead-based paint (LBP), and polychlorinated biphenyls (PCBs), all of which are typically found in older buildings and utilities infrastructure.

Asbestos is regulated by USEPA under the Clean Air Act, Toxic Substances Control Act, and CERCLA. USEPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM. ACMs are generally found in building materials such as floor tiles, mastic, roofing materials, pipe wrap, and wall plaster. USEPA has implemented several bans on various ACMs between 1973 and 1990, so ACMs are most likely in older buildings (i.e., constructed pre-1990). ACMs on Eglin AFB are managed in accordance with the installation’s asbestos management plan and through a database that holds detailed information on surveys and abatement actions. ACMs are generally maintained in place until the building is renovated or demolished (DAF, 2017b).

LBP was commonly used prior to its ban in 1978. Therefore, any building constructed prior to 1978 might contain LBP. Eglin has conducted surveys of LBP, and it has been identified in older buildings. The installation’s LBP management plan provides guidance on how to protect DAF personnel and the public from exposure and the management and disposal of LBP (DAF, 2017b).

PCBs are man-made chemicals that persist in the environment and were widely used in construction materials (e.g., caulk) and electrical products prior to 1979. All structures constructed prior to 1979 potentially include PCB-containing building materials. The electrical infrastructure of Eglin is considered PCB-free because none of the electrical transformers on the installation contains PCBs at concentrations greater than 50 parts per million (DAF, 2017b).

Debris

Debris refers to solid materials (usually nonhazardous) that are deposited on the surface of terrestrial or aquatic environments. Debris may include man-made munitions, items, devices, equipment, and/or materials, uniquely military in nature, expended during mission events that release nonhazardous, non-reactive solid waste materials into the environment, such as metals (brass, copper, steel, and aluminum), polymers (nylon, rubber, vinyl, and plastics), glass, fiber, or other materials.

As with chemical materials, management and disposal of debris is also guided by DAFMAN 32-7002, *Environmental Compliance and Pollution Prevention*. In addition, Eglin has also developed the DAF Integrated Solid Waste Management Plan, which addresses the management of solid waste at Eglin AFB (DAF, 2020b). Eglin currently implements mitigations to minimize the potential presence of military mission sources of debris.

Debris is collected and packed off site for proper disposal (FAC Chapter 62-701, *Solid Waste Management Facilities*). As needed, post-mission surveys are conducted to recover debris. Mission debris is removed and disposed of in accordance with federal and state regulations and Eglin operating policies, instructions, and procedures. EAFBMAN 13-212 states that inhabited areas of the range should be scheduled for periodic policing to remove unwanted debris and that debris should be collected and properly disposed of in accordance with regulations and local procedures. Given the established range debris policing policies, debris from military missions within the study area is likely minimal.

Environmental Restoration Program

The Environmental Restoration Program (ERP) is used by the DAF to identify, characterize, and remediate past environmental contamination on DAF installations. The ERP has established a process to evaluate past disposal sites, control the migration of contaminants, identify potential hazards to human health and the environment, and remediate the sites. Regulations affecting ERP management at Eglin integrate investigative and remedial protocols of CERCLA and RCRA processes, as well as state environmental compliance programs, primarily those found in FAC Chapter 62-770, *Petroleum Contamination Site Cleanup Criteria*.

Cleanup of contaminated property to safe levels is the first priority of the ERP at Eglin AFB; however, lack of feasible and/or cost-effective remedies for some site conditions necessitates the use of land use controls (LUCs). LUCs are mechanisms that are primarily used to limit human activities at or near a contaminated site. LUCs are designed to protect the public and the environment from residual hazardous substances during and after remediation.

3.6.1 Affected Environment

3.6.1.1 Testing/Training Activities

The majority of the test areas within the Eglin A and B Ranges study area are subject to munitions expenditure activity, which generates munitions-related wastes. Identification of the test areas and the munitions utilized on each test area, if any, are presented in Table 2-2. Munitions expenditure activity on the test areas may result in various munitions debris (sometimes referred to as range residue), such as ordnance fragments (e.g., shell casings, smokes, flares, etc.), target remains, and unnatural materials, being deposited within the areas. Range munitions debris/residue is assumed to either have contained explosives or been exposed to explosives. The accumulation of munitions debris/residue on test areas can result in the contamination of soil, surface water, and groundwater if left in place; however, mission debris (to include munitions debris) would be removed and disposed of in accordance with federal and state regulations and Eglin operating policies, instructions, and procedures.

Potential exists for some hazardous materials to be released during mission activities. The potential impacts that released hazardous materials have on air quality, soils, water resources, and biological resources are assessed under their respective resource section. Additional analysis information pertaining to specific test areas within the study area, where available, is provided below.

3.6.1.2 TAs A-73, A-77, A-78, A-79, B-7, and B-75

The 2013 REA for TAs A-73, A-77, A-78, A-79, B-7, and B-75 (DAF, 2013a) identified numerous chemical materials (including hydrochloric acid, barium compounds, antimony compounds, lead compounds, and ozone) that were released during munitions testing. In accordance with the requirements of the USEPA EPCRA TRI program, Eglin is required to report to USEPA its annual releases of chemical materials from all sources, including munitions testing (DAF, 2017b).

The 2013 REA also identified examples of debris deposited from activities in these test areas that may potentially result in environmental impacts and include shell casings, canisters from signal smokes, flares, and chutes from flares, UXO (primarily inert items), and litter and refuse from daily mission activities, including ground troop movement.

3.6.1.3 TA A-90

There are no Installation Restoration Program (IRP) sites located on the SAR; however, the 2019 EA (USACE, 2019) identified two IRP sites located within the surface danger zone (SDZ) for 7.62-millimeter (mm) rounds. The sites include the Prairie Creek Drum Site (Point of Interest [POI]-392) and the CV-22 Crash Site (Spill Site-284). The Prairie Creek Drum Site was given a No Further Action Status in 2016 by USEPA and is listed as, "closed" in the Eglin *Environmental Restoration Program Sites Status Report* (DAF, 2021). The CV-22 aircraft crash on June 13, 2012, discharged a maximum of 1,500 gallons of JP-8 jet fuel. The debris of the aircraft was removed shortly after the incident, but no soils were removed. Currently, Eglin is in the planning stages of performing a Site Assessment to evaluate the potential impacts of the fuel release with regard to soil and groundwater quality. Based on the release of JP-8 jet fuel, potential contaminants at the site may include benzene, toluene, ethylbenzene, and total xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) in groundwater and soil at Spill Site-284. Groundwater monitoring, active remediation, or site closeout may be performed pending the results of the site assessment (USACE, 2019). The 2019 EA (USACE, 2019) determined no impacts to these sites would occur under implementation of the Proposed Action evaluated in the 2019 EA (USACE, 2019) and there would be no effect on hazardous materials or hazardous wastes from the construction of the small arms training range.

3.6.1.4 TA B-12

The 2006 Final Environmental Baseline Document (EBD) for TA B-12 identified two ERP sites located on the test area that had been remediated, closed, and require no further action. There are currently no active ERP sites on TA B-12 (DAF, 2006).

Examples of debris deposited from activities that may potentially result in environmental impacts include litter and refuse from daily mission activities including ground troop movement.

3.6.1.5 TA B-70

The 2010 REA for TA B-70 (DAF, 2009) indicates there are no ERP sites located in or around TA B-70. However, there are three Legacy Debris Pit (LDP) sites located on the eastern border of TA B-70. LDPs are areas where ordnance and explosive waste residues are present or buried in the water, soil, or sediment. Eglin AFB's AFCEC/Operations Division (AFCEC/CZO) Environmental Restoration Office identifies and manages LDPs to monitor known and potential areas of concern regarding munitions. LDP sites located within TA B-70 are listed in Table 3-39. Detailed information on all LDP sites can be found in the *Archives Search Report for Legacy Debris Pits at Eglin AFB* (USACE, 2002).

Table 3-39. Legacy Debris Pit Sites Located Within TA B-70

Location	Description	POI#
TA B-70 Location A	The AOC is known to have munitions on the surface, and is suspected to be an LDP. Munitions found in the area included bomblets.	POI 607
TA B-70 Location B	The AOC is a known LDP. The area is marked with a metal sign. There are metal drums and munitions on the surface. There are bomblets on the surface. The area is approximately 50 by 100 feet in size, off the road approximately 150 feet.	POI 608
TA B-70 Location D	There are munitions on the surface and partially buried. The area is approximately 50 feet by 200 feet in size.	POI 609

Source: (USACE, 2002)
= number; AOC = Area of Concern; LDP = Legacy Debris Pit; POI = Point of Interest; TA = Test Area

Examples of debris deposited from activities at TA B-70 that may potentially result in environmental impacts and include shell casings, canisters from signal smokes, flares, and chutes from flares, UXO (primarily inert items), and litter and refuse from daily mission activities, including ground troop movement.

3.6.1.6 TAs B-71 and B-82

For the mission activities occurring on TAs B-71 and B-82, metals and explosives from bombs, missiles, guns, mines, small arms, smokes, chaff, and flares are the primary chemical materials of concern. The 2010 REA for TAs B-71 and B-82 (DAF, 2010a) identified numerous chemical materials (including benzene, cyclohexane, ethylbenzene, toluene, hydrochloric acid, and lead).

Examples of debris at TAs B-71 and B-82 include cartridges, shrapnel deposited from bombs and missiles, intact inert bombs, canisters from smokes, chaff, and flares, as well as litter and refuse from ground troop movement, may be deposited from testing and training activities.

There are no LDPs located on TAs B-71 or B-82; however, there are three LDPs located near the western border of TA B-71 and one LDP site located on the southern border of TA B-71.

3.6.1.7 Test Area and Road Maintenance

Maintenance actions include routine retrieval and disposal of UXO and range debris, clearance activities, target management, vegetation management, and maintenance of range access/control infrastructure. Hazardous materials and petroleum products have also been used on some TAs for purposes such as routine maintenance of infrastructure and equipment, pesticide applications, and fuel for equipment. Hazardous wastes and debris may be generated from these types of activities. Any hazardous waste or debris generated would be managed in accordance with federal and state regulations and Eglin operating policies, instructions, and procedures.

3.6.1.8 Construction

Minor construction, demolition, renovation, and facility modifications has occurred throughout the Eglin Range. Debris generated by construction and disposal activities are managed and disposed of in accordance with applicable solid waste regulations and guidance, as addressed at the beginning of this resource section (Section 3.6, Hazardous Materials/Waste and Debris).

3.6.1.9 Environmental Restoration Program

Detailed information on all active and closed ERP sites can be found in the Eglin *Environmental* Restoration *Program Sites Status Report* (DAF, 2021). ERP sites located on the Eglin A and B Ranges that are included as part of the analysis are listed in Table 3-40 below.

Table 3-40. Environmental Restoration Program Sites Located Within the Study Area

Location	Site ID	Site Status[1, 2, 3]	Site Description
A-73	POI-392	Closed	Prairie Creek Drum Dump Site located southwest of TA A-73
A-77	POI-413	Closed	Proposed Bridge Target
	POI-606A	Closed	XU6571, Range A-77 Area 2
A-78	POI-414	Closed	Proposed Bridge Target
A-79	POI-414	Closed	Proposed Bridge Target
B-7	POI-600	File Closed	XU656A, Legacy Debris Pit Site Atwell Ponds A and B, located near TA B-7
B-12	POI-309	Closed	AUX Field No.7, Site B-12; Pit with Paint Cans
B-70	POI-415	Closed	Proposed DU Experimental Areas
	POI-307	Closed	Indigo Creek Dump Area located west of TA B-70 in Santa Rosa County
	OT-83	File Closed	Cattle Dipping Vat Pocosin Pond located 540 feet north of the northern part of TA B-70
	POI-607	File Closed	Also known as LDP Site 02-B70A, located in the west-central part of the Eglin Reservation along the south-central edge of TA B-70
B-71	POI-393	Closed	Hydraulic Tower
	POI-399	Closed	Site 9 Burn Pots
	POI-521	Closed	Jettisoned Fuel Ponds Near B-71
	POI-523	Active	Fast Cook-Off Test Spill Site
	POI 610	Closed	Also known as LDP Site 02-B71A, located along the southeastern edge of TA B-71
	POI 611	Closed	Also known as LDP Site 02-B71C, located along the northwestern edge of TA B-71
B-75	AOC 58	AOC File Closed	Wolf Creek Drum Disposal Site
B-82	AOC 77	Closed	B-82 Munitions TA Disposal Site
	POI-416	Closed	Proposed Air-to-Ground DU Firing

Source: (DAF, 2021)
AOC = Area of Concern; AUX = auxiliary; DU = Depleted Uranium; ID = identification; LDP = Legacy Debris Pit; No. = Number; OT = Other; POI = Point of Interest; SS = Spill Site; TA = Test Area; XU = Military Munitions Response Program Site
Notes:
1. Closed status is defined as a site with no ongoing activities such as, but not limited to, Florida Department of Environmental Protection agreed to No Further Action (USACE, 2019).
2. Active status is defined as a site with ongoing activities (e.g., land use controls, third-party leases, and/or current investigation) (USACE, 2019).
3. File Closed is defined as an Area of Concern (AOC) or Point of Interest (POI) site further investigated under another site identification, most commonly, further investigated as an Installation Restoration Program (IRP) site with an IRP site identification (USACE, 2019).

3.6.1.10 Summary of Potentially Affected Resources

A summary of existing conditions in the context of hazardous materials/waste and debris is shown in Table 3-41.

Table 3-41. Summary of Existing Conditions with Regard to Hazardous Materials/Waste and Debris

Test Area	Munitions Usage	Active ERP Sites	Restrictions/Regulatory Requirements
A-73	No	No	NA
A-77	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701
A-78	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701
A-79	No	No	NA
A-90	No	Yes	Pending the results of the site assessment, groundwater monitoring, active remediation, or site closeout may be performed at this site.
B-7	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701
B-12	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701
B-70	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701
B-71	Yes	Yes	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701; Annual LUC site inspection submittal of the Annual LUC Inspection Report to FDEP by July 1 of each year until LUCs are removed.
B-75	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701
B-82	Yes	No	EPCRA 313 TRI Reporting; 40 CFR 261.21-24; FAC Chapter 62-701

CFR = Code of Federal Regulations; EPCRA = Emergency Planning and Community Right-to-Know Act; ERP = Environmental Restoration Program; FAC = Florida Administrative Code; FDEP = Florida Department of Environmental Protection; LUC = land use control; N/A = not applicable; TRI = Toxic Release Inventory

3.6.2 Environmental Consequences

Hazardous materials are evaluated in accordance with 40 CFR 1508.27. Chemical material expenditures are analyzed with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The key factors of importance in this assessment are the relative hazard or toxicity of the chemical, its propensity for dilution or persistence and accumulation, and the quantity and area in which it would be deposited.

The level of impact associated with hazardous materials/waste and debris and the impact's potential significance is determined by considering how proposed action effectors could interact with hazardous materials/waste and debris in terms of context, intensity, and duration.

Context for hazardous materials/waste and debris may be:

- Localized, with impacts to individuals
- Regional, with population-level impacts

Intensity can be either adverse or beneficial, and may be:

- Neutral, with no perceptible change in the resource category
- Low, with no management requirements needed, and unavoidable adverse impacts recoverable through natural processes
- Medium, with potential need for management requirements to avoid adverse impacts, and unavoidable adverse impacts likely recoverable with BMPs and management requirements
- High, with management requirements necessary to minimize or avoid adverse impacts and unavoidable adverse effects that may not be recoverable

Duration may be:

- Short term, with an effect that would likely last for a few days to weeks
- Medium term, with an effect that would likely last for a few months to a year
- Long term, with an effect that would likely endure for the life of the action

Debris can be measured in terms of number of items deposited over time, volume of affected area, surface area covered, or other parameters. Potential nonhazardous mission debris for this analysis include gun ammunition metal casings and smoke grenade canisters and signal flare plastic, paper, and/or metal materials. It is assumed that all food and water containers and packing used during mission events are retrieved and properly disposed. In addition, based on current military recovery debris policies, it is further assumed that the majority of solid waste generated during mission events would be recovered.

The potential environmental impacts of hazardous materials/wastes and debris were assessed as they pertain to debris from ground troop movement and chemical materials from ordnance for testing and training activities within the Eglin A and B Range test areas. Additionally, the transport, storage, use, and disposal of hazardous materials and wastes associated with activities within the study area should be coordinated with Eglin's Environmental Compliance Branch, and disposed of appropriately according to regulations and Eglin's *Hazardous Waste Management Plan*. Any mission activities taking place near identified ERP sites should be coordinated with Eglin Environmental Management Restoration. In regard to hazardous materials, Eglin has implemented a comprehensive Hazardous Material Management Process, guided by DAFMAN 32-7002, *Environmental Compliance and Pollution Prevention*. These materials would be stored in the proper containers, employing secondary containment as necessary to prevent/limit accidental spills. All spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported.

Eglin has developed emergency response procedures and site-specific contingency plans for all hazardous material locations. Procedures and responsibilities for responding to a hazardous material spill or other incidents are described in the *Hazardous Waste Management Plan* (DAF, 2019c) and the Eglin AFB *Final Spill Prevention, Control, and Countermeasure Plan Update* (DAF, 2019d).

To summarize the analysis presented in this section for hazardous materials/waste and debris, Table 3-42, Table 3-43, and Table 3-44 show the potential impacts for the No Action Alternative and Alternative 1.

3.6.2.1 No Action Alternative

Under the No Action Alternative, there would be no significant issues/impacts anticipated in relation to hazardous materials/waste and debris. The management of hazardous materials/waste and debris on test areas within the study area would continue to be conducted in accordance with all applicable environmental compliance regulations and Eglin environmental management plans, as described at the beginning of this resource section (Section 3.6, Hazardous Materials/Waste and Debris). The potential impacts that hazardous materials released during test area operations have on air quality, soils, water resources, and biological resources are assessed under their respective resource.

Table 3-42. Potential Impacts on Hazardous Materials/Waste and Debris from Testing and Training Activities Under the No Action Alternative

Test Area	Munitions							Explosives/ Pyrotechnics (Number of Expenditures or Detonations)					Miscellaneous Explosive Components		
	Large Ordnance (e.g., MK-66 Practice Bomb)		Large Cartridge (e.g., 105-mm Round)		Medium Cartridge (e.g., 40-mm Round)		Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Mines	Grenade	Simulators	C-4	Rocket/ Missile	Smoke/ Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator	Electromagnetic Radiation
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	Gnd	Gnd	Gnd	Gnd	A/G, Gnd	Gnd	Gnd	NA
A-73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
A-77	0	-	-	-	-	-	-	0	-	-	0	-	-	0	0
A-78	0	-	-	-	-	-	-	0	0	-	0	-	-	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
B-7	0	-	0	-	-	-	-	0	0	0	0	-	0	0	0
B-12	0	0	0	0	0	0	-	0	-	-	0	0	0	-	-
B-70	-	-	-	-	0	-	-	-	0	-	-	-	-	-	-
B-71	-	0	-	0	0	0	0	0	-	0	-	-	0	-	-
B-75	0	0	0	-	-	-	-	0	-	0	-	0	-	-	-
B-82	0	-	0	0	0	0	0	0	0	0	-	0	0	-	-

A/G = air-to-ground; Gnd = ground; mm = millimeter

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Table 3-43. Potential Impacts on Hazardous Materials/Waste and Debris from Test Area and Road Maintenance Associated With Each Test Area Under the No Action Alternative

Test Area	Fixed- and rotary-Wing Aircraft	Detonation Cord/C-4	Herbicides	Dismounted Maneuver	Wheeled Vehicles	Wheeled Heavy Equipment	Tracked Heavy Equipment	Generators/Small Equipment	Point Impact–Land Disturbance	Incidental Surface Disturbance	Land Clearing	Plowing and Earth Moving	Culvert/Bridge/Ford Materials	Fill Dirt	Chains with Tree Cutter	Biological Controls
A-73	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
A-77	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
A-78	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
A-79	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
A-90	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
B-7	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
B-12	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
B-70	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
B-71	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
B-75	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-
B-82	-	-	0	0	-	-	-	-	-	-	-	-	-	0	0	-

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Eglin has procedures to comply with TRI reporting requirements and would track ordnance use associated with the Proposed Action. If Proposed Action activities would result in reporting thresholds being exceeded at the base for any new chemicals, new procedures could be required; however, there would be no new activities under the No Action Alternative.

Some mission activities, such as air operations, dismounted maneuver, wheeled and tracked vehicles, and heavy equipment would, under normal circumstances, have a neutral/no effect with regard to the introduction of hazardous chemicals or solid materials into the environment. However, there is a remote potential that, during training, vehicles could leak petroleum, oil, and lubricants or be involved in an accident that results in a spill of these materials. The probability of a substantial leak that is not at least partially contained, or a spill resulting from a collision or other accident, is assumed low.

In summary, the potential for adverse impacts to hazardous materials and waste from testing/training and maintenance activities at each test area would not be significant.

3.6.2.2 Alternative 1 (Current Plus Future)

Under Alternative 1, impacts would be the same for those TAs addressed under the No Action Alternative. Alternative 1 also adds future actions, including construction of new test infrastructure, facilities, and roads and new activities and changes to existing activities, as described below.

No adverse impacts related to hazardous materials are anticipated from implementation under this alternative. Hazardous and nonhazardous waste would be generated as a result of the C&D activities. Management of hazardous waste would be performed according to prescribed procedures already in place and therefore, no change to permits, hazardous waste generator status or management procedures would be required.

3.6.2.2.1 TA A-73

Under Alternative 1, potential impacts to hazardous materials and waste would be similar to those addressed in the EMR EA (DAF, 2017a). Hazardous materials and wastes would continue to be managed in accordance with applicable federal, state, and local regulations as well as Eglin AFB management procedures. Therefore, no known significant impacts from hazardous materials/waste and debris are anticipated on TA A-73. The potential impacts that hazardous materials released during test area operations have on air quality, soils, water resources, and biological resources are assessed under their respective resource.

In summary, the potential for impacts to hazardous materials and waste from proposed future actions at each test area would be discountable (Table 3-44).

Table 3-44. Potential Impacts on Hazardous Materials/Waste and Debris from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	Air-to-Ground-Small Ordnance	Maintenance
A-73	-	0	0	0	0	-
A-77	-	0	0	0	-	-
A-78	-	0	0	0	-	-
A-79	-	0	0	0	-	-
A-90	-	0	0	0	-	-

Table 3-44. Potential Impacts on Hazardous Materials/Waste and Debris from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	Air-to-Ground-Small Ordnance	Maintenance
B-7	-	0	0	0	-	-
B-12	-	0	0	0	-	-
B-70	-	0	0	0	-	-
B-71	-	0	0	0	-	-
B-75	-	0	0	0	-	-
B-82	-	0	0	0	-	-

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.6.2.3 Cumulative Effects

Chemical material emissions are primarily related to munitions expended during testing and training operations. Munitions associated with testing and training on the test areas would result in additional materials deposited onto the Eglin Reservation. The potential cumulative impacts of all past, present, and future ordnance constituents and by-products are difficult to assess. Cleanup of ordnance from ranges is not always thorough or even feasible. Constituents from ordnance may migrate to soils, surface water, and groundwater. However, the potential for significant impacts due to chemical emissions on the Eglin A and B test areas is decreased by the general requirement for debris removal and the dispersed nature of activities.

Some testing and training activities, construction projects, and maintenance and repair activities may involve the use/storage of hazardous materials and generation of debris or hazardous waste. However, management practices regarding transport, storage, use, and disposal of hazardous materials/waste and debris would continue to be implemented. No significant impacts would be expected from the combination of activities, and any impacts would be addressed by using current Eglin hazardous materials and hazardous waste management procedures and policies.

3.6.2.4 Management Actions

- Development within the cantonment areas would avoid ERP sites; however, if C&D activities were to occur within or near an ERP site, the proponent would coordinate their actions with the Eglin Environmental Branch, USEPA, the Florida Department of Environmental Protection, and other relevant stakeholders, as required. Additional NEPA analysis would also be required.
- Construction will adhere to the present hazardous waste management program tracking and reporting requirements, as well as AFI 32-7086, *Hazardous Materials Management*.
- Nonhazardous solid waste associated with building construction activities would be recycled to the extent possible.

3.7 NOISE

As discussed in this section, noise is unwanted sound that can be intrusive, annoying or harmful to people. Noise affects several resource areas, and it is discussed in several sections of this EA. This section will concentrate on general noise effects to humans. Additional discussion of specific noise effects on other affected resources can be found in Section 3.3 (Biological Resources) and Section 3.4 (Cultural Resources).

Characteristics of noise that affect how it is perceived include its intensity, frequency content, and duration. Multiple noise metrics (i.e., units of measure) have been developed to best describe different types of noise and to support the prediction of specific types of noise effects. Noise metrics used in this EA are described briefly below.

Decibel. Sound levels are recorded on a logarithmic dB scale, reflecting the relative way in which the ear perceives differences in sound energy levels. A sound level that is 10 dB higher than another would normally be perceived as twice as loud while a sound level that is 20 dB higher than another would be perceived as four times as loud. Under laboratory conditions, the healthy human ear can detect a change in sound level as small as 1 dB. Under most nonlaboratory conditions, the typical human ear can detect changes of about 3 dB.

Weighted Decibel. Sound measurement may be further refined through the use of frequency "weighting." The normal human ear can detect sounds that range in frequency from about 20 Hertz (Hz) to 20,000 Hz (Federal Interagency Committee on Noise, 1992). However, all sounds throughout this range are not heard equally well. In "A-weighted" measurements, the frequencies in the 1,000- to 4,000-Hz range are emphasized because these are the frequencies heard best by the human ear. Sound level measurements weighted in this way are termed A-weighted dB (dBA). In the case of sonic booms, blast noise, and other impulsive "booming" noises, sound is felt as well as heard. With these types of noise, overpressure may be considered more annoying than the sound itself. For this reason, impulsive sounds are measured in terms of dBP. Impulsive noise may also be measured using "C-weighting," which does not attenuate the lower frequencies to the extent that A-weighting does. Sound level measurements weighted in this way are termed C-weighted dB.

Maximum Noise Level (L_{max}). The L_{max} is the highest sound level measured during a single event in which the sound level changes with time (e.g., a rocket launch). Maximum A-weighted sound pressure level is useful for prediction of activity interference (e.g., speech interference).

Day-Night Average Sound Level (DNL). The DNL noise metric is the dB-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. to account for added intrusiveness of late-night noise. DNL is the primary noise metric of the Federal Aviation Administration, DoD, and USEPA. Studies of community annoyance in response to numerous types of environmental noise show that there is a positive correlation between DNL and the percent of the population that can be expected to be highly annoyed by the noise. The onset-rate adjusted monthly DNL (L_{dnmr}) is a variant of DNL that accounts for potential startle effects associated with low-altitude, high-speed aircraft overflight. The C-weighted DNL (CDNL) metric is a version of the DNL metric described above calculated based on C-weighted dB levels.

Military equipment is exempted from federal regulations that impose noise limitations because such regulations could reduce the combat effectiveness of the equipment. Still, the DoD recognizes that noise-sensitive land uses are not compatible with elevated military training noise levels and has adopted guidelines for determining land use compatibility near military installations. According to land use guidelines in DoD Instruction 4165.57, *Air Installation Compatible Use Zones*, residential and other noise-sensitive land uses are not considered compatible with noise levels greater than 65 dB DNL unless special structural noise attenuation measures are installed.

The US Army is the DoD service with the lead role in setting munitions noise policy and has established land use recommendations based on munitions noise levels near training ranges. Army Regulation 200-1 discourages noise-sensitive land uses, such as residential, where small arms firing noise exceeds 87 dBP (moderate noise impact). The same regulation discourages noise-sensitive land uses, such as residential, where large arms noise levels exceed 62 dB CDNL.

Federal health and safety standards prescribe that a person should not be exposed to impulsive sounds greater than 140 dBP without ear protection in a workplace environment (29 CFR Chapter XVII § 1926.52(e)). This threshold is protective of hearing in an occupational setting where workers are potentially exposed on a near-daily basis throughout a career and is conservative in the context of a range. Additionally, while not a specific regulatory requirement, Eglin AFB has an operational goal of limiting individual impulsive peak noise levels to 115 dBP at the reservation boundary. This level is associated with a low risk of complaints according to AR 200-1 (see Table 3-45). A peak sound level of 140 dBP is the threshold for physical injury to humans in the form of temporary loss of hearing.

Table 3-45. Effects From Single Impulsive Acoustical Events

Level of Noise	Effects	Peak Sound Level (dBP)
Audible but Distant	Low risk of noise complaints	<115
Clearly Audible to Loud	Moderate risk of noise complaints	115 to 130
Loud	High risk of noise complaints	130 to 140
Very Loud	Threshold for physical injury to humans and damage to structures	>140

Sources: (U.S. Army, 2008; U.S. Army, 1994; Bureau of Mines, 1980; Siskind et al., 1980; DAF, 2013c)
< = less than; > = greater than; dBP = decibels at peak pressure

The impulsive sound pressure from explosives and large-caliber weapons can cause structures to vibrate. This vibration is perceived by the occupants as the rattling of loose windows and objects on shelves. Potential damage incurred by airborne vibrations is primarily fractured window glass, and does not typically occur at levels less than 140 dBP (U.S. Army, 1994; Bureau of Mines, 1980).

3.7.1 Affected Environment

Eglin AFB is an active base; thus, aircraft, explosives, and small arms firing noise are typical noises. Other noise-generating activities on the Eglin Reservation include on- and off-road vehicle traffic, and noise generated by heavy equipment being used for construction, maintenance or forestry operations. Based on measurements taken in similar rural areas, background sound levels (i.e., levels when military operations are not under way) on the Eglin Reservation can be assumed to be approximately 45 dB (USEPA, 1974). There are several communities situated around the Eglin Reservation.

3.7.1.1 TA A-73

Radar test operations and ground training on TA A-73, involve vehicles and equipment that generate locally elevated noise levels. As shown in Table 2-2, no munitions expenditures were recorded during FY 2018 through FY 2023. The closest noise-sensitive location to TA A-73 is residences located approximately 5 miles south of the test area.

3.7.1.2 TA A-77

TA A-77 is used for training with air-to-ground and ground-to-ground munitions including large ordnance, large/medium/small-cartridge rounds, and rockets/missiles (see Table 2-2). Side-firing weapons systems (e.g., the AC-130 gunship) are frequent users of TA A-77, and generate a distinctive noise signature when firing large- and medium-caliber munitions from the air. The closest noise-sensitive location to TA A-77 is residences located approximately 4 miles south of the test area targets.

3.7.1.3 TA A-78

TA A-78 is used for training with air-to-ground and ground-to-ground munitions including large ordnance, large-/medium-/small-cartridge rounds (including side-firing weapons systems), and rockets/missiles. The closest noise-sensitive location to TA A-78 is residences located about 3 miles south of the high-explosive (H-E) impact area.

3.7.1.4 TA A-79

TA A-79 is closed to mission activity and noise-generating operations on this test area is limited to occasional ground vehicle movements along RR 234, which traverses the site.

3.7.1.5 TA A-90

Once it has been constructed, TA A-90 will be a Maneuver-Fire SAR, which will support firing of rounds up to 7.62 mm as well as the operation of ground vehicles. Other noise sources will include use of equipment (e.g., generators) and similar noise-generating activities in support of training. Although construction of the range is ongoing (as of February 2025), operations on TA A-90 have been assessed for environmental impacts and are considered part of baseline conditions. The closest noise-sensitive location to TA A-90 is residences located about 4 miles south of the test area.

3.7.1.6 TA B-7

The range is used for side-firing weapons systems and other tactical air-to-ground training. The closest noise-sensitive location to TA B-7 is residences located about 4 miles north of the test area detonation area.

3.7.1.7 TA B-12

Noise-generating activities on TA B-12 include munitions firing, static testing of munitions, ground forces training, assault aircraft operations at Field 7 (Epler Field), and unmanned aerial systems operations. The closest noise-sensitive location to TA B-12 is residences located about 6.5 miles north of the test area.

3.7.1.8 TA B-70

TA B-70 supports a wide variety of noise-generating activities including munitions testing, supersonic and subsonic aircraft overflights as part of munitions testing, unmanned aerial systems operations, and ground unit training. Items tested on TA B-70 range from small submunitions up to 5,000-pound bombs. The closest noise-sensitive location to TA B-70 is residences located about 6 miles south of the test area targets.

3.7.1.9 TA B-71

TA B-71 is primarily used for munitions testing. Other noise sources include ground vehicle and equipment operations in support of range activities. The closest noise-sensitive location to TA B-70 is residences located about 4 miles south of the test area targets.

3.7.1.10 TA B-75

TA B-75 is used primarily for munitions testing, supporting items up to stacks of 500-pound bombs. The closest noise-sensitive location to TA B-75 is residences located about 4.5 miles north of the test area targets.

3.7.1.11 TA B-82

TA B-82 is primarily used for air-to-ground munitions testing. The closest noise-sensitive location to TA B-82 is residences located about 5.5 miles south of the test area targets.

3.7.2 Environmental Consequences

Noise levels associated with No Action and Alternative 1 activities were assessed to determine whether off-installation communities would be exposed to levels expected to result in significant impacts. Construction and maintenance activity was assessed based on equipment noise levels and propagation equations contained in the Federal Highway Administration's Roadway Construction Noise Model (Federal Highway Administration, 2006). Noise levels associated with H-E munitions were calculated using the OneShot module of the program BNOISE (version 2). These values were used in a screening-level analysis to identify any test areas at which existing or proposed munitions use would exceed 62 dB CDNL at noise-sensitive locations. For this analysis, late-night munitions firing (i.e., during the late-night period between 10:00 p.m. and 7:00 a.m., which is relevant to calculation of CDNL) was assumed to make up 10 percent of overall firing. The screening-level analysis is described in greater detail in Appendix C (Noise Technical Information). Noise levels associated with air-to-ground munitions firing was estimated using the Air Gunnery Noise Model and small arms munitions noise levels were estimated using the Small Arms Noise Assessment Model.

The potential significance of noise impacts was considered in terms of context and intensity. For this analysis, noise impacts would be considered potentially significant (i.e., warranting more detailed analysis) if implementation of the Proposed Action would cause noise levels at a sensitive location to increase as follows:

- If non-impulsive noise levels, which are generated by sources such as construction/maintenance equipment and subsonic aircraft operations, would increase from less than 65 dB DNL to greater than 65 dB DNL (i.e., levels above which not all land uses are considered compatible according to DAF guidelines).
- If impulsive noise levels generated by large arms munitions usage (e.g., bombs) would increase from less than to greater than 62 dB CDNL (i.e., land use compatibility with time-averaged noise levels) or 115 dBP (i.e., peak level associated with a moderate risk of complaints).

3.7.2.1 No Action Alternative

Under the No Action Alternative, there would be no increase in operational tempo or changes in types of activities conducted, and noise levels would remain the same as under baseline conditions. This section summarizes noise levels and potential noise impacts associated with these ongoing activities. The analysis of the No Action Alternative references previous impacts assessments where relevant. This section describes noise generated by activities, such as construction and maintenance, that occur both inside the subject test areas and also in portions of the Eglin Reservation outside of the test areas. The section then goes on to describe activities in or associated with individual test areas.

Occasional construction and maintenance activities involving heavy equipment would continue to occur at test areas and other portions of the Eglin Reservation under the No Action Alternative, generating noise levels that do not exceed threshold levels at noise-sensitive off-installation locations. Equipment operating on the modeled representative construction/maintenance activity site included a backhoe, dozer, ground compactor, generators, pickup trucks, and pneumatic tools, which were assumed to operate for up to 50 percent of the standard 8-hour workday. Resulting noise levels at various receptor distances from the construction site are listed in Table 3-46. At distances greater than 400 feet from the construction site, noise levels drop below the 65 dBA DNL. Although the specific location of construction and maintenance activities would vary, these proposed activities would not occur within 400 feet of sensitive locations. Construction and maintenance activity noise would be temporary, lasting only for the duration of the construction or maintenance activity and would occur in the context of an acoustic environment that includes much louder military testing and training noise. Noise generated during construction and maintenance activities involving heavy equipment would be similar to levels generated by these same activities in the past, would not exceed impact thresholds, and would not result in significant noise impacts.

The operations of ground vehicles and equipment in support of missions conducted on the test areas and on other portions of the Eglin Reservation result in locally elevated noise levels. For example, at a distance of 50 feet, the operations of a heavy truck and a generator result in noise levels of 76 dB and 81 dB, respectively (Federal Highway Administration, 2006). Similar to the construction and maintenance operations noise described previously, ground vehicle and equipment operation noise levels attenuate to below threshold levels and do not extend beyond the boundaries of the Eglin Reservation.

Table 3-46. Construction Noise Level Expected From a Typical Construction Site

Distance to Receptor (feet)	L_{max} (dBA)	DNL (dBA)
100	79	74.7
200	75	68.8
300	70	65.2
400	67	62.7

DAF = Department of the Air Force; dBA = A-weighted decibels; DNL = day-night average sound level; L_{max} = maximum noise level
Note: Conversion from workday time-averaged noise level to the DAF primary noise metric DNL was accomplished using a formula provided in the Roadway Construction Noise Model User's Manual. The formula adds 10 times the logarithm of the ratio of active time to the averaging time period to the overall site L_{max} (Federal Highway Administration, 2006).

Aircraft operations conducted as part of the testing and training missions on Eglin AFB generate elevated noise levels within the Eglin Reservation and in surrounding communities. Aircraft operations at the Eglin Main runways, Duke Field, and Naval Outlying Landing Field Choctaw generate noise levels that do not exceed 65 dB DNL at the assessed test areas as described in the Air Installations Compatible Use Zones Study for Eglin AFB and Duke Field (DAF, 2018a). Aircraft operations at Hurlburt AFB also do not generate noise levels that exceed 65 dB DNL at the assessed test areas (DAF, 2011b). Noise levels beneath Restricted Area 2915A were assessed in the Supplemental Environmental Impact Statement for F-35 Beddown at Eglin AFB and were found to not exceed 65 dB L_{dnmr} (DAF, 2014a). Supersonic aircraft operations above the Eglin Reservation were assessed as part of the TA B-70 Final Range EA and were found to generate potentially annoying sonic booms in communities outside the Eglin Reservation (DAF, 2009). The designated supersonic flight corridor crosses TA B-70 (the supersonic munitions employment test area) in a southwesterly direction, and sonic booms most strongly affect the communities, such as Holley and Navarre, which lie in that in that same direction.

Noise impacts associated with training operations are limited to annoyance for people living in communities near the Eglin Reservation. People working on the Eglin Reservation in areas exposed to potentially hazardous noise levels are required to wear hearing protection and to undergo auditory testing in accordance with the DoD Hearing Conservation program minimizing risk to hearing loss. Noise levels with potential to generate other impacts (e.g., hearing damage) have not been found to occur outside the boundaries of the Eglin Reservation in previous analyses of operations (DAF, 2006; DAF, 2007a; DAF, 2009; DAF, 2013a; DAF, 2019a). This finding has not changed as of the current assessment, as will be described below for the individual test areas.

3.7.2.1.1 TA A-73

Operation of vehicles and equipment at TA A-73 in support of radar tests would generate elevated noise levels on and near TA A-73 under the No Action Alternative. Continuation of ongoing and previously assessed activities in TA A-73 would not generate additional noise impacts.

3.7.2.1.2 TA A-77

Noise generated by munitions detonations in TA A-77 was assessed in the 2013 *Eglin Air Force Base, Florida, Air and Ground Gunnery: A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* and found to have no significant impacts (DAF, 2013a). To confirm and update the findings of the 2013 assessment, a screening-level analysis was conducted reflecting current munitions usage, as described in Table 2-2. Details of the analysis are provided in Appendix C (Noise Technical Information). As shown in Table 3-47, detonation of the Mk-82 500-pound bomb on TA A-77 would not generate peak noise levels exceeding 115 dBP at the closest noise-sensitive location 4 miles away under average weather conditions. CDNL values estimated to reflect current munitions expenditures are also well below 62 dB at the closest noise-sensitive location.

Table 3-47. Large Arms Munitions Detonation Noise Levels

Test Area	Representative H-E Ordnance	Approximate Distance (miles) to Closest Sensitive Location	Annoyance Threshold Radius (miles) (115 dBP)	115 dBP Extends into Community	62 CDNL Extends into Community
B-7	Mk-82	4	2.5	No	No
B-12	Hand grenade	6.5	1.0	No	No
B-70	5,000-lb bomb	6	5.5	No	No
B-71	Mk-82	4	2.5	No	No
B-75	Mk-82	4.5	2.5	No	No
B-82	Mk-82	5.5	2.5	No	No
A-77	Mk-82	4	2.5	No	No
A-78	Mk-82	3	2.5	No	No
A-79	Not Applicable	2	n/a	No	No
A-90	Not Applicable	4	n/a	No	No

CDNL = C-weighted day-night average sound level; dBP = decibels at peak pressure; H-E = high-explosive; lb = pound

Firing of the 105-mm howitzer from an AC-130 gunship while operating in a typical weapons employment profile generates noise levels exceeding 115 dBP within a lateral distance of approximately 1.5 miles from the aircraft under average weather conditions (see Appendix C, Noise Technical Information, for details). Firing of smaller caliber munitions, such as the 40-mm rounds fired from AC-130 gunships, generates lower noise levels. Mission parameters (e.g., flight path/firing direction, altitudes), atmospheric conditions vary from one mission to the next affecting noise levels experienced at sensitive locations. The noise generated by air-to-ground munitions employment has potential to be annoying, particularly when it occurs at night, and if noise level exceed 115 dBP.

As noted in the *Eglin Air Force Base, Florida*, *Air and Ground Gunnery: A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment*, munitions noise is strongly affected by weather conditions. In general, strong winds, cool temperatures, and temperature inversions can result in a worst-case scenario for noise impacts to the community. coordination between the Eglin Safety Office and mission personnel is key to avoid certain weather conditions that may exacerbate noise effects (DAF, 2013a).

As noted previously, no new activities or change in operations tempo are proposed under the No Action Alternative. Continuation of ongoing activities at TA A-77 would not result in additional noise impacts relative to those experienced under baseline conditions.

3.7.2.1.3 TA A-78

TA A-78 supports similar activities similar activities to the activities conducted in TA A-77, and noise impacts associated with continuation of these activities would be similar. Munitions detonation noise in TA A-78 was also assessed in the *Eglin Air Force Base, Florida, Air and Ground Gunnery: A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* and found to have no significant impacts (DAF, 2013a). Detonation of a Mk-82 bomb on TA A-78 would generate noise levels less than 115 dBP at the closest sensitive location 3 miles away, and time-averaged noise levels associated with current munitions usage would be below 62 dB CDNL based on the findings of a screening-level analysis (Table 3-47). Air-to-ground gunnery, including firing from AC-130 gunships, would continue to generate noise levels that may exceed 115 dBP at sensitive locations under certain mission parameters and atmospheric conditions. As no new activities or change in operations tempo are proposed under the No Action Alternative, there would be no additional noise impacts.

3.7.2.1.4 TA A-79

TA A-79 is closed to mission activity. Ground vehicle noise generated in the test area would not be audible at the closest noise-sensitive off-installation location, and noise impacts would be minimal.

3.7.2.1.5 TA A-90

Operations at TA A-90, which has not yet been constructed, were assessed in the 2019 *Final Environmental Assessment Construction and Operation of a New Small Arms Range, Eglin Air Force Base, Florida* and found to have no significant impacts (USACE, 2019). As discussed previously in Section 3.7.2.1.1 (TA A-73), firing of small arms, operations of ground vehicles, and operations of equipment generate elevated noise levels in the vicinity of the test area; however, noise levels generated by the loudest of these activities (i.e., small arms firing) decreases to below threshold levels within 1.5 miles of the firing location (see Table 3-48). Noise levels at the closest noise-sensitive location, approximately 4 miles south of TA A-90, would be well below threshold levels.

Table 3-48. Example Small Arms Firing Noise Levels (7.62 mm)

Location Relative to Firing	Distance to 87 dBP (miles)[1]
Forward	1.5
Rear	0.5
Side	1

Source: Small Arms Range Noise Assessment Model OneShot Module (USACE Construction Engineering Research Laboratory, 1999)
dBP = decibels at peak pressure; mm = millimeter
Note:
1. Distances are rounded to the nearest 0.5 mile.

3.7.2.1.6 TA B-7

TA B-7 supports similar activities similar activities to the activities conducted in TA A-77, and noise impacts associated with continuation of these activities would be similar. Munitions detonation noise in TA B-7 was also assessed in the *Eglin Air Force Base, Florida, Air and Ground Gunnery: A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* and found to have no significant impacts (DAF, 2013a). Detonation of a Mk-82 bombs on TA B-7 would generate noise levels less than 115 dBP at the closest sensitive location 4 miles away, and time-averaged noise levels associated with current munitions usage would be below 62 dB CDNL based on the findings of a screening-level analysis (Table 3-47). Air-to-ground gunnery, including firing from AC-130 gunships, would continue to generate noise levels that may exceed 115 dBP at sensitive locations under certain mission parameters and atmospheric conditions. As no new activities or changes in operations tempo would occur under the No Action Alternative, there would be no additional noise impacts relative to baseline conditions.

3.7.2.1.7 TA B-12

Noise-generated activities conducted in TA B-12 were assessed in the *Test Area B-12 Final Environmental Baseline Document, Revision 1* and found to not result in significant noise impacts (DAF, 2006). Small arms firing generates noise levels that exceed 87 dBP only within 1.5 miles of the firing location (see Table 3-48). Unmanned aerial systems and assault aircraft operations generate noise levels comparable to other aircraft operations ongoing within Eglin AFB airspace and would not be audible at the closest noise-sensitive location 6.5 miles away. The largest munitions used on TA B-12 in recent years have been grenades (see Table 2-2), but the size of munitions that may be expended on the range are set by Range Safety on a case-by-case basis (EAFBMAN 13-212). Detonation of a 5,000-pound bomb on TA B-82 would generate noise levels exceeding 115 dBP within 5.5 miles of the explosion under average weather conditions (Table 3-47). Such a detonation, which is not specifically proposed but which is theoretically a part of the No Action Alternative would not expose the closest noise-sensitive location (6.5 miles away) to noise levels exceeding 115 dBP. The continuation of current munitions usage tempo at TA B-12, which is described in Table 2-2, would result in noise levels well below 62 dB CDNL at the closest noise-sensitive location, as shown in Table 3-47. As no new activities or changes in operations tempo are proposed under the No Action Alternative, there would be additional no noise impacts at TA B-12 relative to baseline conditions.

3.7.2.1.8 TA B-70

Noise generated by test missions conducted in TA B-70 were assessed previously and found to not result in significant noise impacts (DAF, 2009). Noise sources at TA B-70, which include supersonic aircraft operations and munitions detonation noise would not change under the No Action Alternative.

Supersonic aircraft operations conducted as part of air-to-ground munitions testing in TA B-70 have been approved to occur up to 56 times per year. The supersonic operations generate potentially annoying sonic booms in nearby communities, as discussed in Section 3.7.2.1 (No Action Alternative).

Testing of munitions up to 5,000-pound bombs is currently approved in TA B-70 (EAFBMAN 13-212). The use of larger munitions at TA B-70, including the GBU-43B, which contain 18,700 pounds of H6 explosive, has been previously assessed and found to not result in significant noise impacts. GBU-43B detonations generated noise levels exceeding 115 dBP (i.e., moderate complaint risk) but not 140 dBP (hearing loss risk threshold) in communities both north and south of the Eglin Reservation under average weather conditions, as shown in Figure 3-11. Munitions used currently on TA B-70 generate less intense noise than the GBU-43B, exceeding 115 dBP within 5.5 miles of the detonation under average weather conditions remaining below 115 dBP at the closest noise-sensitive location which is 6 miles away (Table 3-47). Time-average munitions noise levels associated with No Action Alternative munitions expenditures are below 62 dB CDNL based on the results of a screening analysis described in Appendix C (Noise Technical Information).

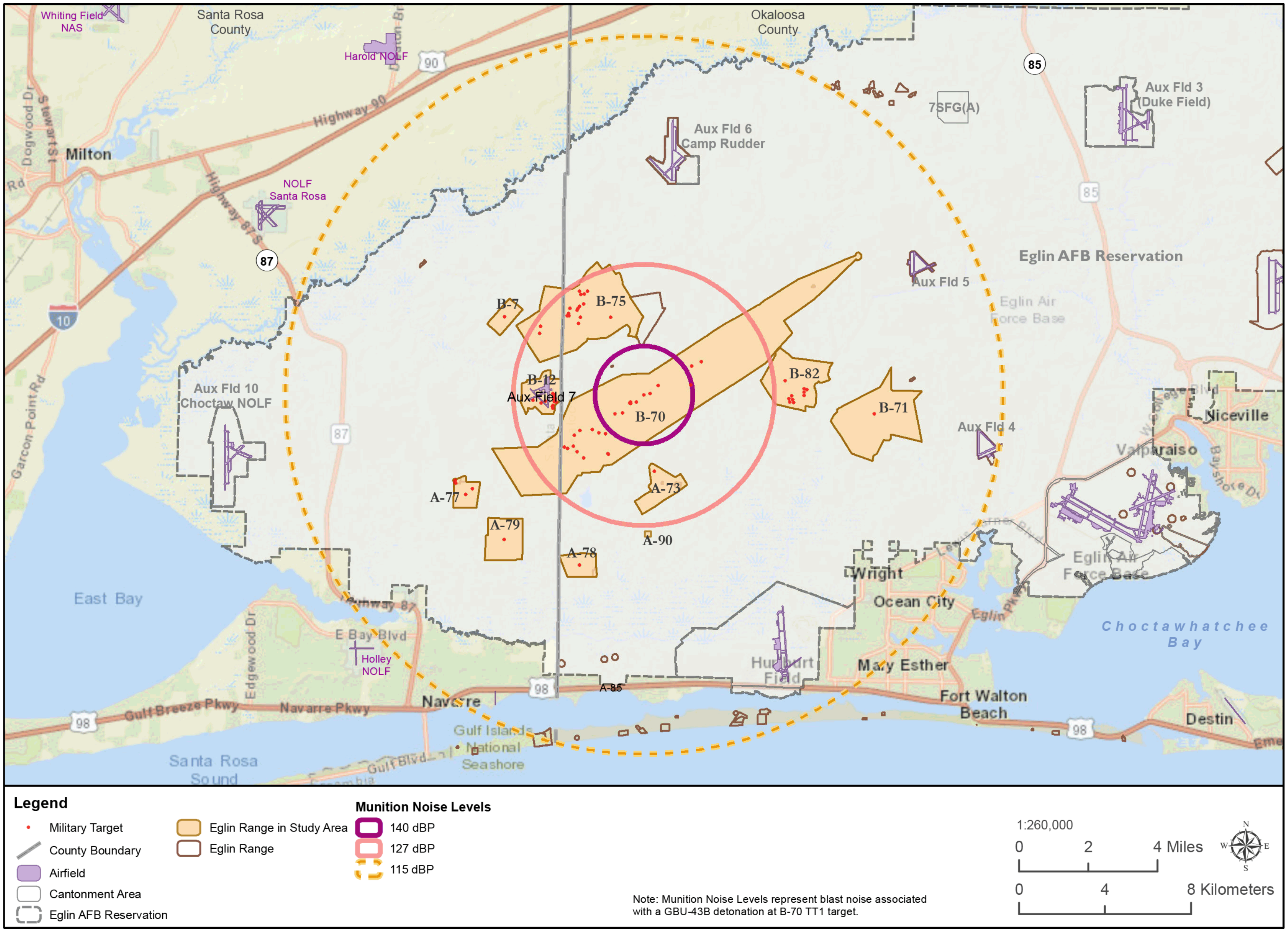


Figure 3-11. Noise Levels from Munitions Under Average Weather Conditions in the Study Area

Noise levels associated with current operations at TA B-70 would remain below thresholds, and impacts would be limited to annoyance. Impacts associated with continued operations at TA B-70 under the No Action Alternative would not be significant.

3.7.2.1.9 TA B-71

Noise generated by test missions conducted in TA B-71 were assessed in the *Test Areas B-71 and B-82 Range Environmental Assessment* and found to not result in significant noise impacts (Eglin AFB, 2010a). As shown in Table 2-2, TA B-71 supported a total of 69 H-E (i.e., large ordnance munitions, large cartridge rounds, grenades, C-4 charges, and rocket/missiles). Detonation of a Mk-82 bomb on TA B-71 would generate noise levels less than 115 dBP at the closest sensitive location 4 miles away, and time-averaged noise levels associated with current munitions usage would be below 62 dB CDNL based on the findings of a screening-level analysis (Table 3-47). Because no new activities or changes in operations tempo are proposed under the No Action Alternative, there would be additional no noise impacts at TA B-71 relative to baseline conditions.

3.7.2.1.10 TA B-75

Noise generated by test missions conducted in TA B-75 were assessed in the as part of the *Eglin Air Force Base, Florida, Air and Ground Gunnery: A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* and found to not result in significant noise impacts (DAF, 2013a). As shown in Table 2-2, H-E munitions used on TA B-71 are primarily medium cartridge round, grenades, and explosive charges (e.g., C-4). Although no bombs have been detonated on TA B-75 in recent years, the capability to detonate large ordnance on the test area still exists (EAFBMAN 13-212). Detonation of a Mk-82 bomb on TA B-75 would generate noise levels less than 115 dBP at the closest sensitive location 4.5 miles away. Time-averaged noise levels associated with current munitions usage would be below 62 dB CDNL based on the findings of a screening-level analysis (Table 3-47). Because no new activities or changes in operations tempo are proposed under the No Action Alternative, there would be additional no noise impacts at TA B-75 relative to baseline conditions.

3.7.2.1.11 TA B-82

Noise generated by test missions conducted in TA B-82 were assessed in the *Test Areas B-71 and B-82 Range Environmental Assessment* and found to not result in significant noise impacts (DAF, 2010a). As shown in Table 2-2, H-E munitions used on TA B-82 include 18 large ordnance munitions and 320 explosive charges (e.g., C-4) per year. Detonation of a Mk-82 bomb on TA B-82 would generate noise levels less than 115 dBP at the closest sensitive location 5.5 miles away. Time-averaged noise levels associated with current munitions usage would be below 62 dB CDNL based on the findings of a screening-level analysis (Table 3-47). Because no new activities or changes in operations tempo are proposed under the No Action Alternative, there would be additional no noise impacts at TA B-82 relative to baseline conditions.

In summary, noise impacts on the public from current munitions use on the subject test areas under the No Action Alternative are limited to annoyance. While there would be road and other maintenance operations, the noise from these sources would not extend off the Eglin Reservation. Large munitions would continue to be used on the test area during neutral weather conditions to the extent practicable to minimize the potential for public annoyance. No new activities or changes in operations tempo are proposed under the No Action Alternative, there would be additional no noise impacts relative to baseline conditions.

3.7.2.2 Alternative 1 (Current Plus Future)

This section describes noise impacts associated with Alternative 1 action components in TA A-73, continued munitions expenditures in the other test areas considered, and maintenance/construction activities.

3.7.2.2.1 TA A-73

Use of the new radar sites would involve equipment and vehicles similar to ongoing activities on TA A-73. These activities would result in elevated noise levels in the immediate vicinity of the radar test sites and would not be audible at the closest noise-sensitive locations approximately 5 miles away.

3.7.2.2.2 Continued Munitions Expenditures in Other Test Areas Considered

Under Alternative 1, munitions expenditures in the other test areas considered would be the same as under the No Action Alternative. Because there would be no change, there would be differences in noise levels and no additional noise impacts.

3.7.2.2.3 Road Maintenance and Minor Construction

Road maintenance and minor projects would continue to occur as is also the case under the No Action Alternative. Noise levels generated by these activities would be the same as described for the equivalent activities in Section 3.7.2.1 (No Action Alternative). There would be no additional noise impacts under Alternative 1 associated with road maintenance and minor construction.

3.7.2.3 Cumulative Effects

The Proposed Action would not have significant cumulative noise impacts in combination with other currently ongoing and reasonably foreseeable activities. The Eglin Range has been used for testing and training operations that generate elevated noise levels for several decades. Current munitions noise generated on test areas/sites are considered as part of baseline conditions and continuation of these activities is considered under the No Action Alternative. Construction and maintenance activity has also occurred on the Eglin Range on an as-needed basis, contributing to temporary noise levels increases during the times and places where it occurs. Noise levels generated on test areas/sites are comparable to noise levels generated by past operations, and operations that can reasonably be expected to continue to occur in the future. No dramatic changes in the tempo of operations on the ranges due to actions other than the Proposed Action are foreseeable at this time. Projects being considered for implementation in distant portions of the range, such as the proposed expansion of childcare services north of the ETTC are sufficiently far from test areas affected by the Proposed Action that elevated noise levels would not combine.

3.7.2.4 Management Actions

- Range operators would coordinate with the Eglin AFB Safety Office to determine when meteorological conditions are unfavorable for certain munitions testing. If mission priorities allow, the range operators could consider postponing certain munitions testing, particularly of atypical munitions, during unfavorable weather periods.

- Construction and maintenance activity would primarily occur during normal weekday business hours.
- Heavy equipment mufflers would be properly maintained and in good working order.
- Personnel working on the Eglin Reservation in locations with potentially hazardous noise levels, such as personnel involved in construction and maintenance, would wear adequate personal hearing protection to limit exposure and ensure compliance with the Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) 48-20.

3.8 SAFETY

The safety environment encompasses risk to public health, and with respect to the Proposed Action (i.e., Alternative 1), risk to the health of military personnel and any measures the DAF undertakes that are designed to minimize safety risks. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. For actions occurring on military property with inherent safety risks, procedures are in place that minimize or eliminate risks to the public altogether. The Proposed Action and alternative analyze the safety environment with regard to ground safety, explosive or range safety, facilities and instrumentation, range and road maintenance, restricted access and range closures, potential for UXO, Explosive Safety Quantity Distance (ESQD) arcs for explosive storage, maximum fragment distance (MFD) arcs from munitions testing, harmful noise potential, and potential for wildfire arising from testing or training. Some key regulations with regard to the safe conduct of testing and training missions at Eglin include DAF Instruction (DAFI) 91-202, *The Department of the Air Force (DAF) Mishap Prevention Program*; DAFI 91-205, *Non-Nuclear Munitions Safety Board*; Air Force Policy Directive (AFPD) 91-2, *Safety Programs*, and EAFBMAN 13-212.

This safety section also considers Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which directs federal agencies to (a) make it a high priority, to the extent permitted by law and appropriate and consistent with the agency's mission, to identify and assess environmental health risks and safety risks that may disproportionately affect children and (b) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Facilities/Range and Road Maintenance

Facilities and infrastructure, which includes instrumentation, fencing, and road networks, are constructed, operated, and maintained in accordance with the aforementioned instructions and regulations. Radar and other electromagnetic emitting instrumentation have setbacks or buffers within which people are not allowed to enter when the device is operating. Fencing may be used to establish setbacks. The DAF conducts hazard reviews of all tests that require the design and construction of facilities and/or hardware, or that use hazardous materials. Section 3.5.2.3 (Hazardous Materials/Waste and Debris) provides additional information on hazardous materials and waste and debris as it relates to testing and training in the study area.

UXO

UXO are test or training items that do not explode or operate as designed and remain on test areas. The DAF has policies and regulations in place to address and manage UXO and is continually working to reduce UXO. The DAF periodically studies or surveys areas potentially contaminated with UXO on Eglin AFB and removes UXO from test areas immediately after testing and training events.

Because heavily used areas of the ETTC are designated as closed, the recreating public has a low likelihood of encountering UXO. Nonetheless, all recreational permit holders are briefed on potential hazards and on how to recognize and report UXO. To prevent entry into closed areas, the DAF uses access controls, such as gates and fencing, and posts notifications in areas with a high likelihood of encountering UXO.

Restricted Access/Closures and Weapons Safety Footprints

As necessary, the DAF restricts access to certain areas of Eglin AFB either permanently or temporarily. Some closed areas require Eglin personnel to obtain a "Z-clearance" from the JTTOCC prior to entering, unless personnel routinely work in the area or are supporting a scheduled mission.

The Eglin Safety Office develops weapon safety footprints, typically using statistical methods, data, or computer models to encompass or consider weapon maximum fly-out capability, blast fragmentation distances, blast overpressure levels, and/or flight-termination system effects. The safety footprint is superimposed onto the ETTC to guide restriction of activities that could normally occur within and adjacent to test areas. Such restrictions may result in closure of recreational areas or roads. Any transportation route that traverses Eglin AFB may be subject to temporary closure during testing operations. Closures usually last between 30 and 90 minutes. Major highways such as State Route (SR) 85, SR 285, US Highway 98, and SR 87 have been closed during test events in the past.

The DAF implements a number of standard procedures to ensure public safety and to restrict access to closed test areas and areas temporarily closed for mission purposes. Range gates and all passable trails are closed to prevent entry into an area by nonparticipants. The DAF notifies the public of closures through various media, including radio and newspapers, to prevent nonparticipating vehicles, vessels, and people from encountering mission hazards. News releases identify road closures and potentially hazardous mission elements, such as low-flying aircraft or loud noise. To further ensure safety, aircraft conduct a visual or electronic search and a "cold" pass over the area. If a nonparticipant is sighted, the test or training activity is delayed until the area is cleared and secured. The Central Control Facility on Eglin Main Base may use real-time radar, telemetry, and visual coverage to verify that vehicles, vessels, or people are outside of closed areas.

Reopening a temporarily closed test area is conducted in accordance with DAFMAN 91-201, *Explosive Safety Standards*, which identifies requirements for EOD personnel to declare the impact locations to be safe prior to anyone entering the area.

Quantity Distance (QD) and MFD Arcs

ESQD arcs, which are established under DAFMAN 91-201, *Explosives Safety Standards*, are separation distances between explosives storage and weapons loading and handling areas. The distances are represented by a radius or arc, which is set at a specific distance from the storage area within which explosive hazards are contained. The QD arcs are based on equations in DAFMAN 91-201 that determine the maximum storage capacity of each facility that would be allowable, while preventing explosive propagation from one storage facility to another. Additionally, QDs provide a safety zone between the explosive storage areas and the surrounding areas. QD arcs are not further analyzed in this EA since there are no explosive storage on the test areas evaluated in this EA and therefore, no QD arcs.

The MFD is the furthest distance, either calculated or measured, to which a munitions fragment from the case would be expelled from the munitions detonation point, assuming the detonation occurred in accordance with the design of the munitions (i.e., as planned) DAFMAN 91-201. It is visualized as an arc or radius around the detonation point. MFD arcs are determined either by testing or by an equation that considers the amount of net explosive weight in munitions and type of casing of the munitions DAFMAN 91-201. Fragments produced by sections of nose plugs, base plates, boattails, and/or lugs are not accounted for in MFD calculations. These items can travel to significantly greater distances (greater than 10,000 feet) than the calculated maximum distances DAFMAN 91-201. MFD arcs are not published for any of the Eglin Test Ranges and therefore, are not further analyzed.

Noise

Noise is a safety consideration in the immediate vicinity of a test or training detonation, where noise, overpressure, or blast effects can reach harmful or fatal levels. With distance, the noise diminishes and becomes less of a safety issue and more of a potential community annoyance issue. Noise-related annoyance is addressed in Section 3.6.2.3 (Noise). Eglin policies prevent unsafe noise levels from extending beyond the reservation boundary.

Aircraft Operations and Imaginary Surfaces

Height restrictions for objects near military airfields prevent structures from creating a safety hazard. Fixed-wing aircraft approach and depart airfields along a diagonal line that increases in altitude with distance from the runway. Therefore, taller structures are generally permitted at increasing distance from an airfield. DAF obstruction criteria are contained in Unified Facilities Criteria 3-260-01 and are based in part on criteria provided in Federal Aviation Regulation Part 77, *Objects Affecting Navigable Airspace*. The criteria incorporate numerous planes and surfaces at various distances and altitudes from runways or other applicable areas such as DZs and landing zones.

Height criteria are used to develop imaginary surfaces, which define the three-dimensional airspace that is free of obstacles at and around airfields. Imaginary surfaces are established for most military bases that support aircraft operations and are typically identified in Air Installation Compatible Use Zone studies.

Wildland Fire and Fire Suppression

Testing and training missions can sometimes cause wildfires, the majority of which occur in areas closed to the public. Eglin supports one of three regional offices for the Air Force Wildland Fire Branch, part of the AFCEC Environmental Directorate, which was established in 2012 to manage wildland fire threats to DAF missions. The Wildland Fire Branch provides qualified and equipped personnel to conduct prescribed burns, reduce fuels (e.g., dry underbrush), and respond to wildfires (DAF, 2018b). Eglin Wildland Fire Support personnel stand by as necessary on or near test areas with fire-suppression equipment to respond to mission-related wildfires. Depending on hazards specific to each test, such as the presence of UXO, there are degrees of fire response and methods that may be employed. Fire response designations for test areas consist of restricted, minimal, or no suppression (DAF, 2017c) and are defined as follows:

- Restricted-suppression zone: Fire management operations are limited in restricted-suppression zones due to elevated UXO risk and to keep fuel loadings in these wildfire-prone areas light. In these areas, plows are not used off range roads for fire-line construction except in extreme conditions.
- No-suppression zone: These areas have a high level of contamination from UXO and shrapnel. Suppression activities are generally replaced with a monitoring strategy, and fires are simply allowed to burn out with no intervention. Direct attack is prohibited, except in specific cases, to prevent catastrophic damage to DAF assets, natural resources, or civilian populations.
- Minimum-impact suppression zone: These areas pose lower UXO risk than “no-suppression” and “restricted-suppression” zones, but still pose a higher risk to firefighters than other areas on Eglin AFB. The intent is to minimize soil disturbance and thus reduce UXO exposure within these zones. Water and/or foam are the preferred suppression method. Direct attack with a fire plow is only recommended when water is either not an option or deemed to be ineffective in suppressing a fire.

There are areas on Eglin AFB with no specific fire-suppression designations, within which any approved method for fire response could be employed. Since most wildfires caused by mission activities are located in restricted or closed areas, there is very little risk to the visiting public. During a wildfire, public use areas that are threatened would be closed.

3.8.1 Affected Environment

The potentially affected environment with regard to the safety elements discussed at the beginning of this resource section (Section 3.8, Safety), includes the test areas and the surrounding communities (Figure 3-12).

All test areas analyzed in this EA are closed to the public and subject to Z-clearance requirements. TAs B-82 and a portion of TA B-70 are in a “no-suppression zone” due to the high level of contamination from UXO and shrapnel. Areas adjacent to or nearby TAs B-7, A-77, A-79, B-70, B-71, and B-82 are “restricted-suppression zones.” Noise levels potentially causing injury and annoyance would be produced during activities involving live-munitions use at TAs B-70, B-71, and B-82 (see Section 3.6.2.3, Noise, for detailed description of noise on the test areas). Wildfires are possible from munitions, pyrotechnics, and ground operations.

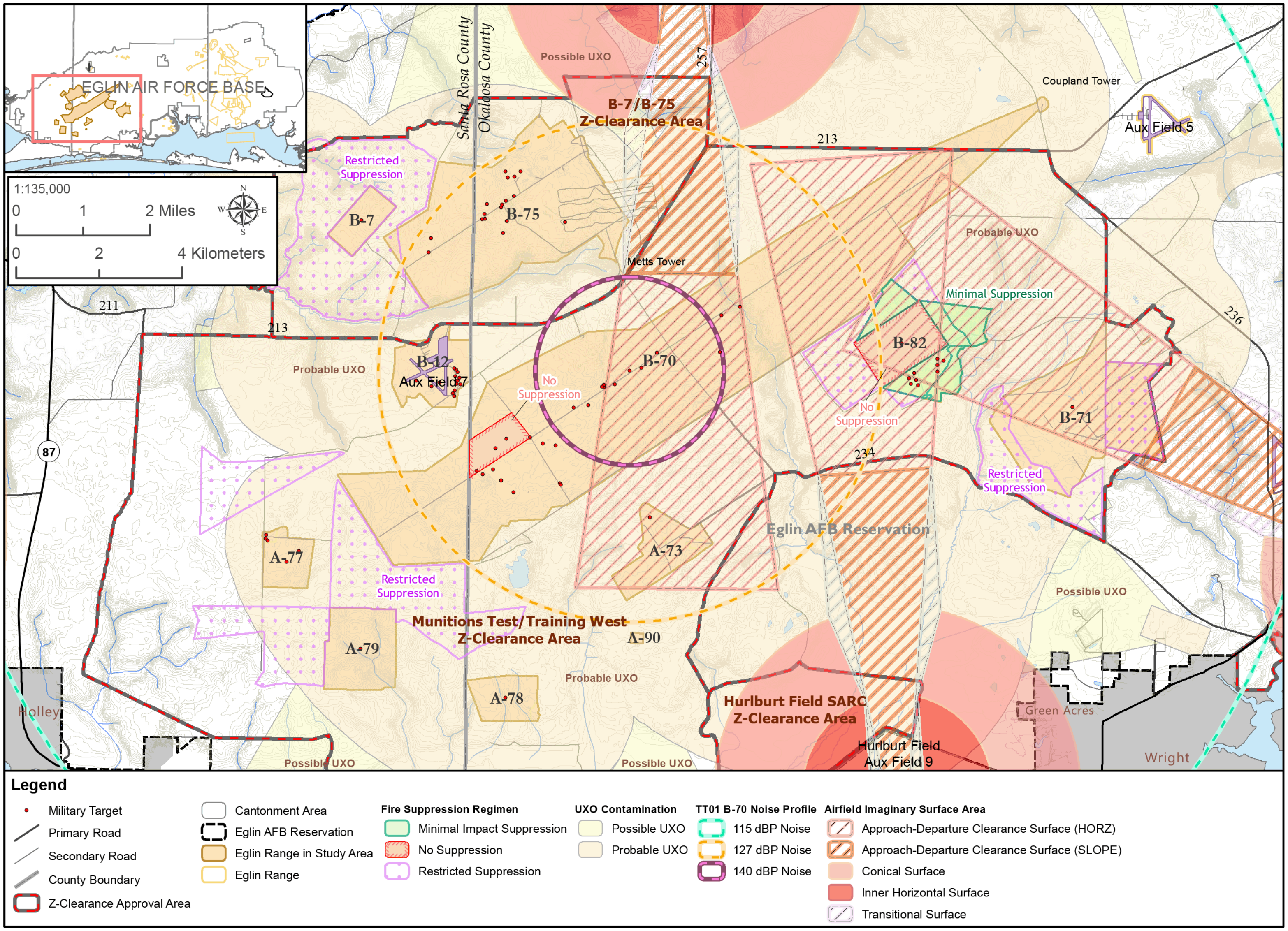


Figure 3-12. Potentially Affected Safety Environment

Test areas analyzed in this EA are located in Okaloosa and Santa Rosa Counties. The percentages of the population in Okaloosa and Santa Rosa Counties that are children or elderly are detailed in Table 3-49.

Table 3-49. Children and Elderly Populations Near Test Areas in the Eglin A and B Ranges

Geographic Location	Total Population	Children (under 18 years)		Elderly (65 years and older)	
		Number	Percent	Number	Percent
Okaloosa County	214,281	48,437	22.6	35,106	16.4
Santa Rosa County	193,719	42,551	22.0	31,890	16.5
Florida	21,928,881	4,305,366	19.6	4,630,733	21.1
United States	332,387,540	73,645,238	22.2	55,970,047	16.8

Source: (USCB, 2024)

3.8.1.1 Summary of Potentially Affected Resources

Table 3-50 summarizes the existing conditions with regard to safety resources on the Eglin A and B Ranges and are shown in Figure 3-12.

Table 3-50. Summary of Existing Conditions with Regard to Safety Resources on the Eglin A and B Ranges

Test Area	Explosive/Range Safety					
	Restricted Access/Closures	UXO Concerns	QD Arcs	Airfield Imaginary Surface Area	Mission-related Noise Beyond Installation	Wildfire Response
A-73	Closed: Z-Clearance Area	Probable	None	Yes	No	None
A-77	Closed: Z-Clearance Area	Probable	None	No	No	Nearby restricted-suppression zones located north, south, and east of the test area
A-78	Closed: Z-Clearance Area	Probable	None	No	No	Nearby restricted-suppression zone located north of test area
A-79	Closed: Z-Clearance Area	Probable	None	No	No	Adjacent to restricted-suppression zone along west, north, and northeast boundary of the test area
A-90	Closed: Z-Clearance Area	Probable	None	No	No	None
B-7	Closed: Z-Clearance Area	Probable	None	No	No	Surrounded by restricted-suppression zone
B-12	Closed: Z-Clearance Area	Probable	None	No	No	Nearby restricted-suppression zone north of the test area
B-70	Closed: Z-Clearance Area	Probable	None	Yes	Yes	Portion of TA is no-suppression area; westernmost boundary of TA is adjacent to restricted-suppression

Table 3-50. Summary of Existing Conditions with Regard to Safety Resources on the Eglin A and B Ranges

Test Area	Explosive/Range Safety					
	Restricted Access/Closures	UXO Concerns	QD Arcs	Airfield Imaginary Surface Area	Mission-related Noise Beyond Installation	Wildfire Response
						zone; portion of northeast boundary of TA near B-82 adjacent to restricted-suppression zone and minimal-suppression zone
B-71	Closed: Z-Clearance Area	Probable	None	Yes	Yes	Portion of B-71 within a restricted-suppression zone
B-75	Closed: Z-Clearance Area	Probable	None	No	No	Western boundary of test area is adjacent to restricted-suppression zone
B-82	Closed: Z-Clearance Area	Probable	None	Yes	Yes	TA B-82 is a no-suppression zone surrounded by a restricted-suppression zone and minimal-impact suppression zone

QD = quantity distance; TA = Test Area; UXO = unexploded ordnance

3.8.2 Environmental Consequences

The impact assessment methodology for safety comprises a review of regulatory drivers affecting safety; analysis of the Proposed Action and alternative and how they could pose safety risks; and evaluation of the significance of potential impacts in terms of type, context, duration, and intensity. Safety includes issues related to fire risks and ground safety, as well as aircraft flight risks resulting from mishaps and Bird/Wildlife Aircraft Strike Hazard (BASH) events. Potential risks associated with the use and handling of munitions are also evaluated.

The primary regulations that establish range safety policy and define requirements and procedures for conducting tests on Eglin AFB and areas under its jurisdiction are found in DAFMAN 91-201, *Explosives Safety Standards*. This guidance is implemented by the 96 TW/Range Safety Office (96 TW/SEU) and supporting organizations. The test safety review process described in Air Force Test Center Instruction 91-202 implements the operational risk management process, as specified in AFPD 91-2, *Safety Programs*, for all Air Force Materiel Command test programs.

Flight safety, including BASH concerns, is addressed in the Overland Air Ops REA (DAF, 2014b). There are ground-based factors that affect bird and wildlife occurrence in an area, such as amount and type of vegetation. Thus, per AFI 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program*, targeted vegetation management is critical to reduce wildlife hazards around airfields or landing areas. Additionally, temporary water sources, such as holding ponds, can attract several types of birds (AFI 91-212). Facility and pavement construction often includes water runoff holding areas for pavement and other impervious surfaces.

Potential disproportionate impacts to children are assessed when adverse environmental consequences to the human population are anticipated; otherwise, no analysis is required. Environmental factors assessed in relation to determination of potential environmental health and safety risks to children include air quality, safety, hazardous materials, and noise. In the event that adverse environmental impacts to the human population are anticipated, the effects would be identified, and the impact footprint would be mapped for the specified ROI. For purposes of this analysis, the ROI encompasses the block groups that are wholly or partially within the affected area, defined as the off-base area exposed to 115 dBP or greater. Noise levels at 115 dBP would not be considered significant but would result in approximately 15 percent of the population being annoyed.

The level of impact associated with the safety environment and the impact's potential significance is determined by considering how Proposed Action effectors or stressors could interact with the safety environment in terms of context, intensity, and duration.

Context for potential safety impacts may be:

- Localized, with impacts to individuals, whether test personnel or the public
- Regional, with community level impacts

Intensity can be either adverse or beneficial, and may be:

- Neutral, with no perceptible change in the safety environment
- Low, with no management requirements needed, and recoverable adverse impacts
- Medium, with potential need for management requirements to avoid adverse impacts, and unavoidable adverse impacts likely recoverable with BMPs and management requirements
- High, with management requirements necessary to minimize or avoid adverse impacts and unavoidable adverse effects that may not be recoverable

Duration may be:

- Short term, with an immediate effect but brief effect on the order of several minutes or hours
- Medium term, with an effect that would likely last for days or a few weeks
- Long term, with an effect that would likely endure for several weeks to several years. For example, increasing the boundaries of a closed area due to UXO concerns

If children (under 18 years of age) are disproportionately impacted, mitigations may be required to reduce or eliminate impacts to these segments of the population. This analysis also considers elderly populations (age 65 years and older).

To summarize the analysis presented in this section for safety, Table 3-51, Table 3-52, and Table 3-53 show the potential impacts for the No Action Alternative and Alternative 1.

3.8.2.1 No Action Alternative

Potential adverse safety impacts with regard to military activities in this EA are managed, prevented, and controlled through an established system of safeguards, safety analysis, and measures that protect human safety. It is the responsibility of the 96 TW/Safety Office to ensure that testing and training missions in the study area do not present an undue hazard to life and property. Other activities such as construction and land management are also evaluated for safety concerns. Eglin Safety Office specialists are involved in all phases of testing and training activity, including safety engineering in the weapon design/procurement phase, safety analysis in the test-planning phase, and safety officer control/coordination during the execution of the test/training activity.

There is potential for mission-related wildfires to indirectly affect public safety. The test areas evaluated in this EA consist of no-suppression, minimal-suppression, and restricted-suppression areas. Smoke from wildfire can decrease visibility along highways and exacerbate certain health conditions. Eglin AFB has a Wildland Fire Branch, a part of AFCEC Environmental Directorate, which has the personnel, equipment, and knowledge to respond to wildfire. Therefore, the risk of a wildfire directly affecting the public health and safety is low.

Road and test area maintenance, debris cleanup, and vegetation control activities would continue to be conducted in accordance with established safety procedures. The potential for accidents during such activities is therefore considered not significant. Road maintenance, debris removal, and other similar activities would generally increase the safety of range operations.

3.8.2.1.1 TAs A-73, A-77, A-78, A-79, B-7, B-70, and B-75

Under the No Action Alternative, the types of munitions to be used would be the same or similar to the types currently used at these test areas and therefore, would not be expected to prevent or significantly limit the ability of range managers to conduct EOD and range maintenance activities. Safety footprints or SDZs would be employed for land-based training where live ordnance is used. At live-fire ranges, personnel exclusion zones and appropriate safety buffers would be developed and implemented. Public access to the test areas is permanently restricted, so no safety risks to the public are expected. Regardless of increased munitions use, established safety procedures and policies would continue to ensure safety of Eglin AFB personnel.

A number of test areas, including TAs B-70 and B-75, contribute to noise levels that extend off of the Eglin AFB Reservation and therefore have the potential to impact off-base populations. Peak sound noise levels of 115 dBP extend beyond the reservation for certain block groups. These noise levels are below peak thresholds set by AR 200-1 and would not result in adverse impacts to the general population. Safety regulations and requirements, which are currently in place, would continue to be followed for all testing and training missions that occur on the test areas under this alternative. Safety footprints are required for all live-munitions use and are adjusted accordingly to minimize potential safety risks to personnel on the test areas and to the public that may be in areas located outside of the test areas. Test areas are closed, and public access is prohibited. Therefore, no significant health and safety risks have been identified that would result in disproportionate environmental health or safety risks to children and elderly populations.

3.8.2.1.2 TA A-90

As described in the *Final Environmental Assessment Construction and Operation of a New Small Arms Range, Eglin Air Force Base, Florida* (USACE, 2019), a composite SDZ has been designated for the SAR at TA A-90. This area would be closed to all personnel during training exercises. The purpose of SDZs is to protect personnel and property from projectile impacts, dispersion, ricochets, fragmentation and debris, backblast, and hazardous overpressure and noise. The SAR will be secured by a gate that restricts access to the facility located near the intersection of the access road and RR 705. There is an existing gate on RR 253 at Hurlburt Field that also prevents military personnel from accessing the range without permission due to the high potential for UXO. Prior to and during training activities, military personnel using the SAR would coordinate with Range Operations to avoid mission conflicts, minimize and avoid potential safety issues, and ensure proper training for the sue of weapons on a live-fire range (USACE, 2019).

No significant impacts to safety are anticipated under the No Action Alternative at TA A-90 since access to the proposed SAR would be restricted and all personnel would receive appropriate training and safety briefings.

3.8.2.1.3 TA B-12

As described in the *Test Area B-12 Final Environmental Baseline Document, Revision 1* (DAF, 2006), there is potential for EMR from the operation of radars and microwave transmitters at TA B-12. However, the potential for human hazard on TA B-12 from the operation of EMR sources is low because of the DoD, DAF, Air Armament Center (AAC), Federal Communication Commission, Occupational Safety and Health Administration, and other government regulations/programs that implement Radio Frequency Radiation (RFR) Safety programs applicable to range activities. EMR programs that deal with radar and microwave emitters involve the recognition and evaluation of the potential risk to human health (DAF, 2006).

AAC Instruction (AACI) 48-102, *Nonionizing Radiation Control Program*, establishes the Nonionizing Radiation Control Program on Eglin with the intended purpose of minimizing hazards created by the use of nonionizing systems and equipment without unduly restricting their use, and to implement required regulatory controls. This instruction also implements AFOSH 48-9, *Radio Frequency Radiation (RFR) Safety Program*. Additional AACIs and other instructions and guidelines for the safe operation of EMR sources are detailed in the EMR EA (DAF, 2017a).

Operations associated with mission support activities at TA B-12 involve radars and microwave transmitters and are sources of EMR. However, as a result of the various safety programs in place, there are no significant impacts associated with EMR.

3.8.2.1.4 TAs B-71 and B-82

TAs B-71 and B-82 are located in areas that are permanently closed to the public. There are open recreation areas in the interstitial area immediately to the east corner of TA B-71 and one very small location in the north portion of TA B-71; TA B-82 is completely surrounded by permanently closed areas. However, some air-to-surface training missions may require closure of much of the western portion of the range, potentially causing closure of Recreation Management Units, range roads, or in the case of the military, adjacent test areas. The size of the safety footprint depends upon the type of munitions and its release characteristics. The duration of closure also depends upon munitions and fuze type and can range from a few hours up to two to three days for cases involving mines with delayed fuze settings. Targets are located in the interior portions of TA B-71 and TA B-82, which are surrounded by permanently closed restricted-access areas.

Under the No Action Alternative, the number of testing and training missions at TAs B-71 and B-82 would be the same or similar to those described in Table 2-2. Therefore, the frequency and duration of access closures for nearby recreational areas would remain similar to existing conditions.

Table 3-51. Potential Impacts on Safety from Testing and Training Activities Under the No Action Alternative

Test Area	Munitions							Explosives/Pyrotechnics (Number of Expenditures or Detonations)					Miscellaneous Explosive Components		Electromagnetic Radiation
	Large Ordnance (e.g., MK-66 Practice Bomb)		Large Cartridge (e.g., 105-mm Round)		Medium Cartridge (e.g., 40-mm Round)		Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Mines	Grenade	Simulators	C-4	Rocket/Missile	Smoke/Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator	
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	Gnd	Gnd	Gnd	Gnd	A/G, Gnd	Gnd	Gnd	
A-73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
A-77	0	-	-	-	-	-	-	0	-	-	0	-	-	0	0
A-78	0	-	-	-	-	-	-	0	0	-	0	-	-	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-7	0	-	0	-	-	-	-	0	0	0	0	-	0	0	0
B-12	0	0	0	0	0	0	-	0	-	-	0	0	0	-	-
B-70	-	-	-	-	0	-	-	-	0	-	-	-	-	-	0
B-71	-	0	-	0	0	0	0	0	-	0	-	-	0	-	0
B-75	0	0	0	-	-	-	-	0	-	0	-	0	-	-	0
B-82	0	-	0	0	0	0	0	0	0	0	-	0	0	-	0

A/G = air-to-ground; GRD = ground; mm = millimeter
Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Table 3-52. Potential Impacts on Safety from Test Area and Road Maintenance Associated With Each Test Area Under the No Action Alternative

Test Area	Munitions							Explosives/ Pyrotechnics (Number of Expenditures or Detonations)					Miscellaneous Explosive Components		Electromagnetic Radiation
	Large Ordnance (e.g., MK-66 Practice Bomb)		Large Cartridge (e.g., 105-mm Round)		Medium Cartridge (e.g., 40-mm Round)		Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Mines	Grenade	Simulators	C-4	Rocket/Missile	Smoke/Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator	
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	Gnd	Gnd	Gnd	Gnd	A/G, Gnd	Gnd	Gnd	
A-73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
A-77	0	-	-	-	-	-	-	0	-	-	0	-	-	0	0
A-78	0	-	-	-	-	-	-	0	0	-	0	-	-	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-7	0	-	0	-	-	-	-	0	0	0	0	-	0	0	0
B-12	0	0	0	0	0	0	-	0	-	-	0	0	0	-	-
B-70	-	-	-	-	0	-	-	-	0	-	-	-	-	-	0
B-71	-	0	-	0	0	0	0	0	-	0	-	-	0	-	0
B-75	0	0	0	-	-	-	-	0	-	0	-	0	-	-	0
B-82	0	-	0	0	0	0	0	0	0	0	-	0	0	-	0

A/G = air-to-ground; GRD = ground; mm = millimeter

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.8.2.2 Alternative 1 (Current Plus Future)

3.8.2.2.1 TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Under Alternative 1, the current level of activity at TAs A-77, A-78, A-90, B-7, B-12, B-70, B-71, B-75, and B-82 would be authorized. There would be no new user groups, types of activities or kinds of munitions. Safety procedures and policies that are currently established would remain in effect and all ordnance would be handled by trained and qualified personnel. Therefore, no impacts to safety would occur to these test areas under this alternative. Similarly, current policies and procedures for UXO monitoring and clearing would remain in place under this alternative. These procedures minimize the risk to Eglin personnel operating on the test areas.

Potential environmental health and safety risks to children under this alternative would be similar to those under the No Action Alternative. To minimize potential safety risks to the public safety regulations and requirements, which are currently in place, would continue for all testing and training missions that occur on the test areas under this alternative. Safety footprints are required for all live-munitions use and adjusted accordingly to minimize potential safety risks to personnel on the test areas/sites and to the public that may be in areas located outside of the test areas. Test areas are permanently closed to the public. Therefore, no significant health and safety risks have been identified that would disproportionately affect children and elderly populations under Alternative 1.

3.8.2.2.2 TA A-73

Operations associated with mission support activities at TA A-73 involve radars, which are sources of EMR. However, no significant impacts associated with EMR under this alternative would be anticipated with implementation of the various safety programs currently established at the ETTC.

Table 3-53. Potential Impacts on Safety from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	Air-to-Ground Small Ordnance	Electromagnetic Radiation	Maintenance
A-73	-	-	-		0	-	0
A-77	-	0	-	0	0	0	0
A-78	-	0	-	0	0	0	0
A-79	-	0	-	0	0	0	0
A-90	-	0	-	0	0	0	0
B-7	-	0	-	0	0	0	0
B-12	-	0	-	0	0	-	0
B-70	-	-	-	0	-	0	0
B-71	-	0	-	0	0	0	0
B-75	-	-	-	0	-	0	0
B-82	-	0	-	0	0	0	0

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.8.2.3 Cumulative Effects

Civilian presence is, and would continue to be, prohibited in unacceptable areas by physical barriers (primarily fencing). Military and contractor personnel and equipment would also be protected by physical barriers and by activation of weapons safety footprints, QD arcs, and MFD arcs. Military and civilian personnel would potentially be exposed to UXO produced during other testing and training activities; however, current range clearance procedures and consultation and coordination with the 96th Civil Engineer Squadron/Explosive Ordnance Disposal (96 CES/CED) would minimize potential adverse UXO impacts. Human exposure to noise levels of concern would not be expected. In general, current safety policies and procedures are expected to ensure personnel safety. There would be no cumulative safety impacts to the general public or to military or contractor personnel from current and future activities on Eglin AFB. No significant health and safety risks to children and elderly populations have been identified as a result of the Proposed Action when compared to the No Action Alternative that would contribute to significant cumulative disproportionate health and safety risks to children and elderly populations.

3.8.2.4 Management Actions

- Observe a restriction of a maximum of 140-dB noise level leaving the Eglin Reservation boundary.
- Prior to detonation of explosive materials, consider the effects of current weather, as well as other safety parameters outlined in the test directive.
- Adhere to Eglin's *Wildfire Specific Action Guide* (DAF, 2013b) restrictions for munitions use.
- Continue to control access to areas with UXO potential.
- Continue to prohibit public access to test areas and test ranges.
- Continue vegetation maintenance on test areas and test sites, particularly locations that support aircraft operations.
- Management actions identified throughout the resources analyzed would be applicable to minimize environmental health and safety risks to children.

3.9 WATER RESOURCES

Water resources include groundwater, surface waters, wetlands, floodplains, and coastal resources. These resources are important for a variety of reasons, including economic, ecological, and recreational functions, and human health. Regulations, statutes, executive orders, and other requirements related to water resources are provided in Table 3-54.

Table 3-54. Regulations, Statutes, Executive Orders, and Other Requirements Related to the Protection of Groundwater, Surface Waters, Wetlands, Floodplains, and Coastal Resources

Statute or Executive Order	U.S.C. or Federal Register	Federal/State Oversight Agency	Eglin Oversight Office	Summary
Clean Water Act	33 U.S.C. §§ 1251-1387	USACE, USEPA, FDEP	96 CEG/CEIEC (Environmental Compliance Office)	Establishes the structure for regulating pollutant discharge into waters of the United States, including surface waters and wetlands. Applicable sections are Section 303(d) (requires states to develop lists of impaired waters), Section 401 (requires water quality certification prior to issuance of 404 permit), Section 402 (NPDES permit

Table 3-54. Regulations, Statutes, Executive Orders, and Other Requirements Related to the Protection of Groundwater, Surface Waters, Wetlands, Floodplains, and Coastal Resources

Statute or Executive Order	U.S.C. or Federal Register	Federal/State Oversight Agency	Eglin Oversight Office	Summary
				program), and Section 404 (regulates discharge of dredged or fill material into waters of the United States).
Florida Water Resources/ Environmental Resource Permit Program	Part IV, Florida Statutes Section 373; FAC Chapter 62-330, Environmental Resource Permitting	Florida DEP, NWFWMD	96 CEG/CEIEC	Regulates activities in, on, or over wetlands or surface waters, and any activity that involves surface water flow alteration, including dredge and fill activities and construction-generated stormwater runoff. FDEP is responsible for administration of water resources at the state level and enforcement oversight for federal and state water resource laws and programs.
Fish and Wildlife Coordination Act	16 U.S.C. §§ 661-667d	USFWS	96 CEG/CEIEA (Natural Resources Section)	Requires federal agencies to consult with the USFWS, NMFS (as appropriate), and state fish and wildlife agencies regarding conservation of wildlife resources when a proposed federal project may result in control or modification of the water of any water body or wetland.
Executive Order 11990, Protection of Wetlands	42 *Federal Register* 26961, (May 24, 1977)	N/A	96 CEG/CEIEC	Requires federal agencies to avoid, to the extent possible, adverse impacts associated with the destruction/modification of wetlands, and to avoid new construction in wetlands wherever there is a practicable alternative.
Rivers and Harbors Act	33 U.S.C. §§ 401 and 403	USACE, USCG	96 CEG/CEIEC	Protects the navigability of waters used for commerce in the United States. Section 10 permit may be required for construction over, under, or in a water of the United States.
Safe Drinking Water Act	42 U.S.C. §§ 300(f)-300j-26	USEPA	96 CEG/CEIEC	Restricts federal agencies from funding activities that would contaminate a USEPA-designated sole source aquifer or its recharge area.
Executive Order 11988, Floodplain Management	42 *Federal Register* 26951, (May 25, 1977)	N/A	96 CEG/CEIEC	Requires federal agencies to avoid, to the extent possible, adverse impacts associated with the occupancy/modification of 100-year floodplains, and to avoid floodplain development wherever there is a practicable alternative.
Coastal Zone Management Act	16 U.S.C. §§ 1451-1466	FDEP	96 CEG/CEIEA	Requires that activities conducted or authorized by federal agencies be consistent with approved Florida coastal zone management program.

§/§§ = Section(s); 96 CEG/CEIEA = 96th Civil Engineer Group/Environmental Assets; 96 CEG/CEIEC = 96th Civil Engineer Group/Compliance; FAC = Florida Administrative Code; FDEP = Florida Department of Environmental Protection; N/A = not applicable; NMFS = National Marine Fisheries Service; NPDES = National Pollutant Discharge Elimination System; NWFWMD = Northwest Florida Water Management District; U.S.C. = United States Code; USACE = United States Army Corps of Engineers; USCG = United States Coast Guard; USEPA = United States Environmental Protection Agency; USFWS = United States Fish and Wildlife Service

Groundwater is subsurface water that occurs in the saturated zone below the water table. It is stored in aquifers, which are geologic formations of rock or sediment that store or transmit groundwater to springs and wells.

Surface waters include streams, rivers, ponds, lakes, estuaries, and oceans. "Waters of the United States" (also called "jurisdictional" waters or wetlands) are defined in the Navigable Waters Protection Rule (33 CFR Part 328) as: "(i) The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; (ii) Tributaries; (iii) Lakes and ponds, and impoundments of jurisdictional waters; and (iv) Adjacent wetlands." A rule published by the US Army Corps of Engineers (USACE) and USEPA in 2023 revised the definition of "waters of the United States" to include wetlands that possess a significant nexus to traditionally navigable waters or reasonably permanent waters (88 *Federal Register* 3004, January 18, 2023).

Per the USACE *Wetlands Delineation Manual*, wetlands include marshes, bogs, swamps, and other similar areas "that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987). Floodplains are broadly described as lowland areas adjacent to surface waters that are subject to flooding during periods of high water discharge. The 100-year floodplain, which is also called the base flood, is defined as an area subject to inundation by a flood that has that has a 1 percent or greater chance of being equaled or exceeded in any given year. A 500-year floodplain is subject to the flood with a 0.2 percent chance of being equaled or exceeded in any given year.

Coastal resources under the CZMA include transitional and intertidal areas, salt marshes, islands, floodplains, wetlands, estuaries, reefs, and beaches, as well as the natural resources occurring within these coastal waters and adjacent shore lands.

3.9.1 Affected Environment

This section describes the water resources that may be affected by the No Action Alternative or Alternative 1. The ROI consists of the A and B Ranges listed in Table 3-55, as well as a 200-foot buffer area around each test area. The affected test areas are shown in Figure 3-13 to Figure 3-15. Per Section 306(d)(2)(A) of the CZMA, the entire state of Florida is considered part of the coastal zone, thus all the ROI is within the coastal zone.

Table 3-55. Potentially Affected Water Resources at Eglin A and B Ranges

Test Area	Number of Wells[1]	Surface Waters	Wetlands (acres)	Floodplains (acres)
A-73	Potable: 1	None	0	0
A-77	0	None	0.5	0
A-78	0	Two unnamed tributaries of East Bay Swamp/East Bay River	0.3	0
A-79	0	Panther Creek, tributary of Panther Creek, Johnson's Pond	94	91
A-90	0	None	0	0
B-7	0	Headwaters of Bear Creek	0	0
B-12	Potable: 1 Groundwater monitoring (abandoned): 6	None	0	0

Table 3-55. Potentially Affected Water Resources at Eglin A and B Ranges

Test Area	Number of Wells[1]	Surface Waters	Wetlands (acres)	Floodplains (acres)
	Groundwater piezometer monitoring (abandoned): 2			
B-70	Potable: 3 Abandoned: 1	Live Oak Creek, Bull Pond	84	399
B-71	Potable: 1 Groundwater monitoring (inactive): 10 Groundwater piezometer monitoring (closed): 3	Two unnamed ponds	3	2
B-75	Potable: 3a	Unnamed seasonal tributary of Wolf Creek, steephead stream slope	8	34
B-82	Potable: 1	None	0	0.03

Note:
1. Includes wells within 1,000 feet of the test area boundary.

Groundwater in the ROI is associated with the near-surface, unconfined sand-and-gravel aquifer (also called the surficial aquifer) and the underlying confined Floridan aquifer, which are separated by layers of clay and marl. The upper boundary of the Floridan aquifer ranges from about 50 feet below land surface at the northeast boundary of Eglin AFB to about 700 feet below the surface at the southwestern boundary. Information on specific depths at test areas in the ROI is not available (Eglin AFB, 2019). However, overall, the boundary is generally considered to be about 100 to 200 feet below the surface. The Floridan aquifer is the primary water source on the installation and in the surrounding counties. Water quality of both aquifers is generally good, but the sand-and-gravel aquifer is vulnerable to contamination from pollutants due to its proximity to the ground surface. American States Utility Services, Inc. (ASUS) is responsible for the management of wells and wastewater systems on Eglin AFB. Wells on the installation are either included in the public water system (PWS) or are designated as limited use wells. PWS wells are wells that supply a minimum number of people or service connections and require sampling to ensure compliance with Safe Drinking Water Act (SDWA) standards. The Florida Department of Environmental Protection enforces drinking water standards. Limited use wells are not subject to sampling under the SDWA, although ASUS conducts bacteriological sampling. In the ROI, the wells associated with TA B-75 are part of the PWS and currently meet federal and state requirements. All other wells in the ROI are limited use wells. Water quality test results indicate that PWS wells in all other areas of Eglin (e.g., main base and Ranger Camp) meet or exceed all requirements (ASUS, 2023). Previous activities have caused contamination of the sand-and-gravel aquifer (e.g., presence of pesticides, heavy metals, petroleum hydrocarbons, and other compounds) at some areas of Eglin AFB (DAF, 2013a), including some of the test areas in the ROI. ERP sites occur on or adjacent to TAs A-77, A-79, B-12, B-70, B-71, B-75, and B-82. All of TA A-77 and large portions of TAs A-79 and B-82 are ERP areas. Wells for potable water and monitoring (ERP sites) are shown in Figure 3-13 to Figure 3-15).

Streams in the northern section of Eglin drain to the Yellow/Shoal River system, while streams in the western and southwestern sections drain to the Pensacola Bay system, which includes East Bay, East Bay River, and Santa Rosa Sound. Most streams within the ROI are classified as either seepage streams or blackwater streams. Seepage streams are relatively short, shallow, narrow water courses originating from shallow groundwater that has percolated through sandy soil. The sand-and-gravel aquifer is the source of most of these streams. Steephead streams are special types of seepage streams characterized by steep slopes terminating in amphitheater-like ravines where the spring flow originates. Blackwater streams are steep-banked streams that characteristically have tea-colored waters containing large amounts of tannins, particulates, dissolved organic matter, and iron from swamps that feed into the streams. Most of the ponds on Eglin AFB are man-made impoundments created by small dams built on streams. Eglin AFB has both permanent and temporarily inundated wetlands, some of which contain herbaceous or woody vegetation. Seepage slopes are unique wetlands with high biodiversity that are maintained by downslope groundwater seepage and fire. The Eglin AFB INRMP (Eglin AFB, 2022) contains additional descriptions of the water resources found on Eglin AFB.

Bear Creek is listed in the most recent 303(d) Florida Statewide Comprehensive Verified List of Impaired Waters due to phosphorus and other nutrient levels, and is under investigation for iron levels (FDEP, 2024a). The main channel of this stream does not flow through any test areas in the ROI, but headwaters occur on TA B-7. Panther Creek is on the Statewide Comprehensive Study List for Escherichia coli levels (FDEP, 2024b). Water bodies are placed on the Study List when, although not meeting one or more water quality criteria, additional information is required to determine whether they have attained designated uses (FDEP, 2024c). A portion of Panther Creek, along with a tributary of the stream, occurs on TA A-79. None of the other streams or water bodies in the ROI are on the 303(d) list or Study List, although in general, receiving waters of streams in the northern and western/southwestern portion of Eglin AFB (Yellow and Shoal Rivers, Pensacola Bay, East Bay, East Bay River, Santa Rosa Sound) are impaired for various contaminants.

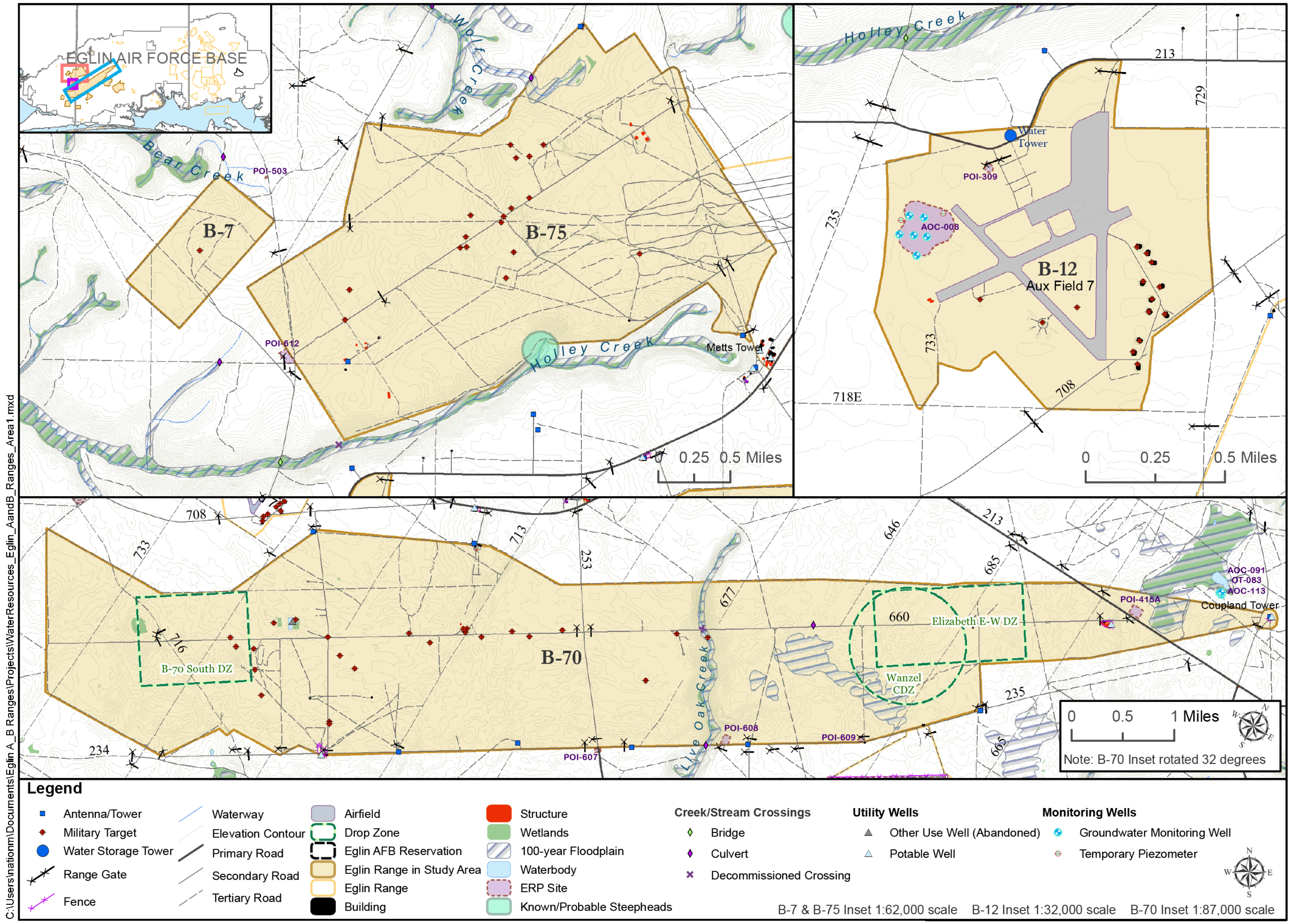


Figure 3-13. Water Resources at TAs B-7, B-12, B-70, and B-75

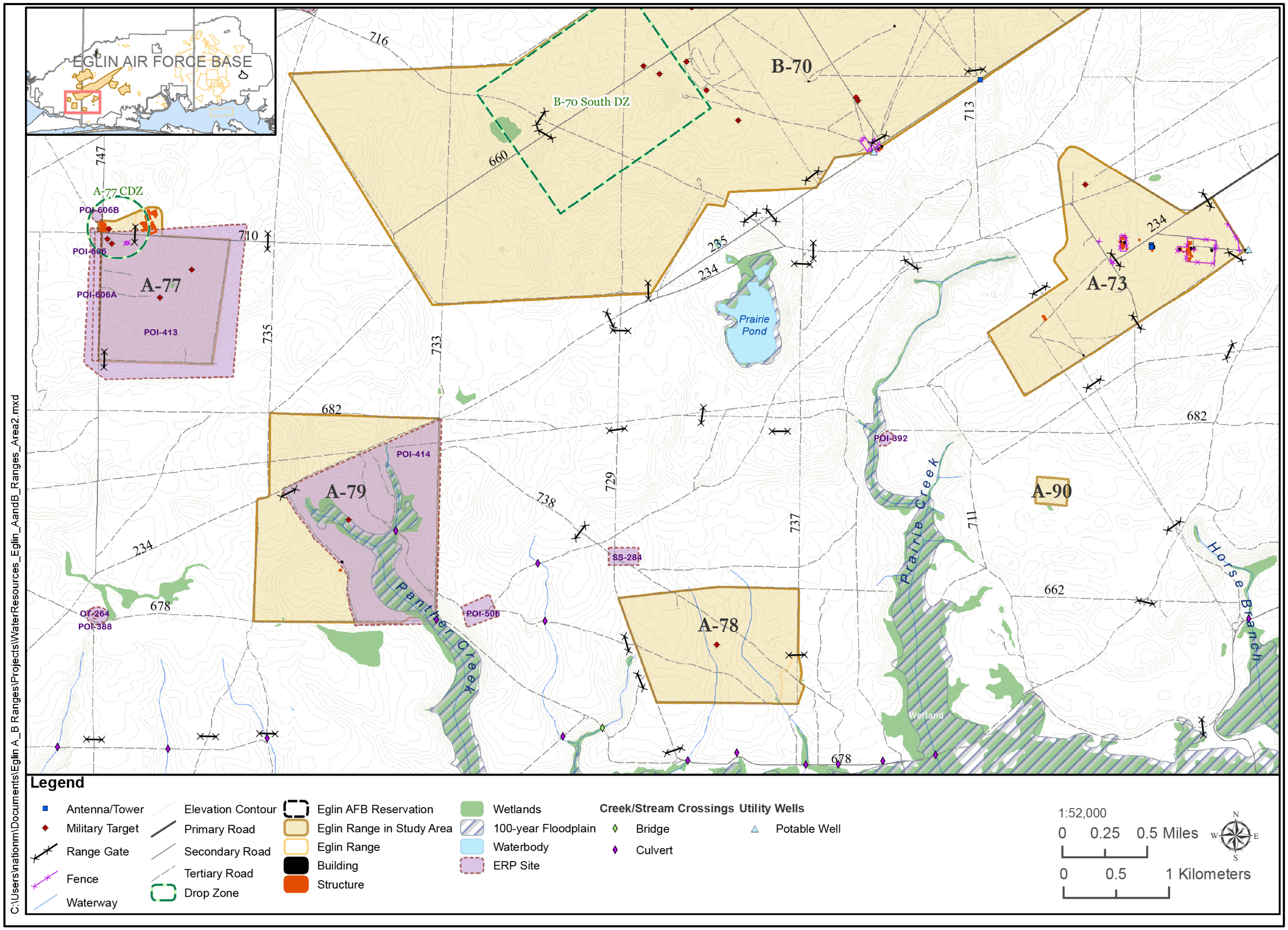
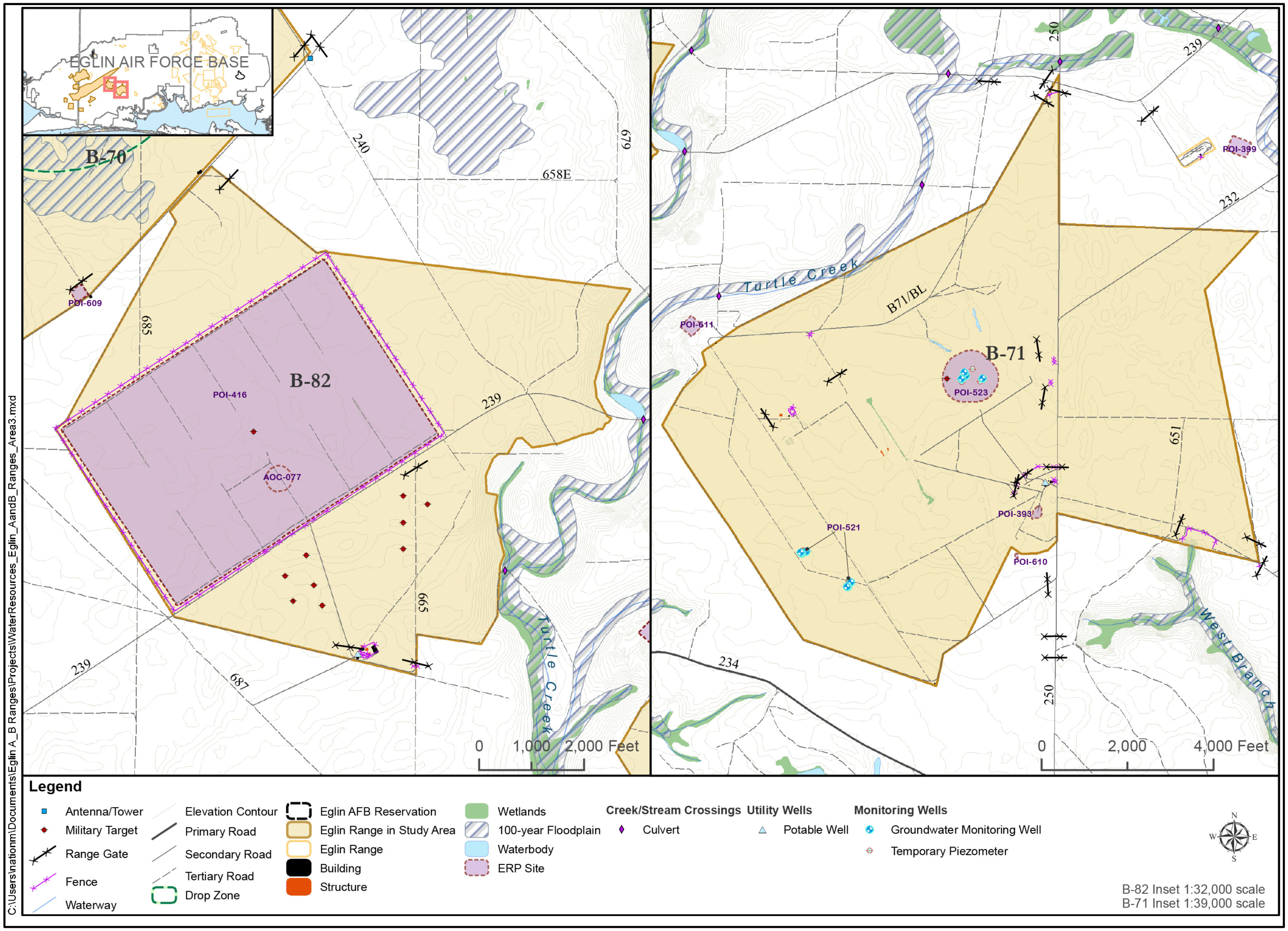


Figure 3-14. Water Resources at TAs A-73, A-77, A-78, A-79, and A-90



1
2 **Figure 3-15. Water Resources at TAs B-71 and B-82**

Portions of TAs A-77, A-78, A-79, B-70, B-71, and B-82 contain wetland or floodplain areas, primarily associated with stream systems. Additional areas of wetlands and floodplains are near some of the other A and B Ranges (Figure 3-13 to Figure 3-15). No surface waters, wetlands, or floodplains are found within TAs A-73, A-90, or B-12.

3.9.1.1 Summary of Potentially Affected Resources

Table 3-55 provides a summary of information on wells, surface waters, wetlands, and floodplains for each test area in the ROI.

3.9.2 Environmental Consequences

Most water resource analyses were programmatic in nature to allow for flexibility in activities, provided management actions and permit requirements are implemented. When appropriate, expenditure amounts and proximity of activities to water resources were examined for potential impacts from erosion, turbidity, hydrologic alteration, and contamination (e.g., fuel, metals, and explosives). Additional considerations included possible effects on public drinking water supplies, and the potential for violations of the regulations, statutes, executive orders, and other requirements described in Table 3-54. Analyses considered implementation of the management actions in Section 3.9.2.5 (Management Actions) and any requirements resulting from applicable permits as part of the Proposed Action.

Significance determinations were based on analyses of the affected environment for water resources and the degree of effects from the Proposed Action, including: (1) beneficial and adverse effects, (2) short- and long-term effects, (3) effects to public health and safety, and (4) effects that would violate applicable laws protecting water resources (see Table 3-56). A significant adverse impact would alter water quality, hydrology, or aquatic habitat to the degree that the natural functions and values of the resource would be diminished long term. Significant adverse impacts would also exist if the Proposed Action exceeded federal, state, or local water quality standards, contaminated drinking water supplies, resulted in noncompliance with executive orders related to wetlands and floodplains, or resulted in failure to meet the requirements of the CZMA (Table 3-54).

Table 3-56. Significant Impact Determinants for Water Resources

Water Resource	Impacts would be significant if the action would:
Groundwater	• Exceed federal, state, or local groundwater quality standards • Contaminate an aquifer used for public water supply to the extent that public health may be adversely affected
Surface Water	• Exceed federal, state, or local water quality standards • Contaminate public drinking water supply to the extent that public health may be adversely affected
Wetland	• Substantially alter the hydrology or water quality required to sustain wetland’s values and functions, including but not limited to drinking water protection and recharge, floodwater/stormwater retention, and natural habitat protection
Floodplain	• Substantially alter the hydrology or water quality required to sustain floodplain values and functions, including but not limited to drinking water protection and recharge, floodwater/stormwater retention, and natural habitat protection
Coastal Resources	• Be inconsistent with the Florida coastal zone management plan • Cause an unacceptable risk to human safety or property • Cause adverse impacts to the coastal environment that could not be mitigated

Where appropriate, impact analyses are summarized from the Preliminary Draft Interstitial Area REA or the REAs listed in Table 1-1. Unless otherwise stated, analyses assumed that requirements in these documents, and those in EAFBMAN 13-212, would be implemented as part of the action to avoid or minimize impacts to water resources. The Proposed Action also incorporates the new management actions listed in Section 3.9.2.5 (Management Actions). Targets, roads, and road-stream crossings within the ROI are shown in the context of wells, surface waters, wetlands, and floodplains in Figure 3-13 to Figure 3-15. For the purposes of discussion, floodplains are considered as wetlands, unless specific mention is necessary per a regulatory driver.

To summarize the analysis presented in this section for water resources, Table 3-57, Table 3-58, and Table 3-59 show the potential impacts for the No Action Alternative and Alternative 1.

3.9.2.1 General Impacts to Water Resources

3.9.2.1.1 Groundwater

Airborne metal and organic chemical by-products from test and training expenditures may be deposited onto soils and surface waters, potentially migrating into the sand-and-gravel aquifer, which is vulnerable to contamination due to its proximity to the ground surface. Pollutants would be unlikely to migrate to the deeper Floridan aquifer due to the presence of a confining layer. Previous analyses on Eglin ranges have determined that the potential concentrations of metals, explosive materials, perchlorate, and dyes would not pose an ecological concern according to USEPA thresholds and that levels would be diluted well below drinking water standards.

Eglin's wells that pump Floridan aquifer waters are regularly sampled to ensure compliance with water quality standards, and the ERP site wells track any potential contaminants from those sites. Eglin institutes a number of requirements at the A and B Ranges to limit the potential for groundwater contamination, including: ordnance clearance following each mission; regular range debris removal; herbicide applications conducted in accordance with requirements of the Long-Term Vegetation Control EA and other standard application guidance; and implementation of spill prevention and response procedures (see Section 3.9.2.5, Management Actions).

3.9.2.1.2 Surface Waters and Wetlands

Sedimentation, water pollution, altered hydrologic form and function, and vegetation damage may occur from foot, vehicle, and equipment traffic, expendables usage, in-water activities, land disturbance/development, and herbicide usage near or within surface waters and wetlands. Suspended sediment in waterways inhibits light penetration and photosynthesis and can affect the physiological functions of aquatic organisms. Sediment deposition in waterways leads to premature filling of water bodies, exertion of large oxygen demands on the water, burial of aquatic habitats, and alteration of stream hydrology. Erosion and sedimentation can also introduce metals and other pollutants into receiving waters. For most of the surface waters and wetlands associated with the A and B Ranges, the potential for these impacts is minimized by the preservation of vegetated buffers and the siting of targets, structures, and mission activities away from streams, ponds, and wetlands.

As discussed previously in Section 3.9.2.1.1 (Groundwater), munitions constituents could be deposited onto surface waters, or migrate to surface waters through groundwater. Factors affecting the potential for impacts include the soil type, landscape slope, frequency of testing, proximity to the stream or wetland, and size of vegetation buffer, among other factors. Section 3.5 (Geology and Soils) indicates that concentrations of metals, explosive materials, and perchlorate are not likely to approach any USEPA risk-based thresholds. Most of the metal constituents would be chemically bound to soil particles, and any that reached a stream, or wetland would typically readily settle out of the water column. Furthermore, most wetlands and streams at Eglin are protected by vegetated buffers that intercept and treat contaminants.

In addition to the vegetated buffers and target siting mentioned earlier, Eglin AFB institutes a number of requirements that specifically limit the potential for surface water and wetland contamination, including ordnance clearance immediately following each mission, regular range debris removal, applications of herbicide conducted in accordance with DAF requirements, restriction of munitions/pyrotechnics use within 100 feet of wetlands and water bodies, and implementation of spill prevention and response procedures (see Section 3.9, Water Resources).

On Eglin AFB, certain maintenance activities historically have contributed to sedimentation and hydrologic issues. While most of these locations have either been decommissioned or stabilized and upgraded, in areas with insufficient or improper maintenance, impacts to surface waters and wetlands may continue, particularly at sloped road-crossing approaches and in steeply sloped areas with little to no vegetation. Additional detail on maintenance impacts to water resources is available in the *Range Roads Programmatic Environmental Assessment* (DAF, 2002) and *Culvert Repairs on Range Roads Programmatic Environmental Assessment* (DAF, 1994).

Eglin AFB institutes the following requirements to specifically reduce the potential for sedimentation, hydrologic alteration, and vegetative damage: maintenance of vegetated buffers, limitation of vegetation cutting and ground-disturbing training activities within 100 feet of wetlands and surface waters, restriction of ground-disturbing wildfire suppression methods within riparian areas and wetlands except in extreme conditions, regular maintenance/repair of primary and secondary range roads and crossings, installation of BMPs for erosion control and stormwater management, and the use of minimally ground-disturbing methods for necessary road and crossing maintenance, vegetation control, and range clearance on slopes and in the vicinity of surface waters and wetlands.

3.9.2.2 No Action Alternative

Under the No Action Alternative, there would be no significant issues/impacts anticipated in relation to water resources. The management of erosion on test areas within the study area would continue to be conducted in accordance with all applicable environmental compliance regulations and Eglin environmental management plans, as described at the beginning of this resource section (Section 3.9, Water Resources). There are no new activities under the No Action Alternative.

3.9.2.2.1 TA A-78

TA A-78 is an active training range primarily used for tactical air-to-ground training in gunnery, bombing, and rocket delivery as well as for ground forces training. The test area includes a tactical air-to ground and surface-to-surface live-fire target area and a separate non-lethal ammunition training area. There is a simulated village training facility in the southeast portion of the test range. Other infrastructure includes a clay-surfaced HLZ, earthen berm small arms firing line and wooded dismounted maneuver area (Eglin AFB, 2022).

The small portions of streams present at or near the test areas of the TA A-78 are surrounded by a cleared area which is surrounded by dense woods. Due to a lack of significant water resources at or near the test area, there would be no impacts to water resources. There is one target area between two streams. According to Section 3.5 (Geology and Soils), it is not expected that the chemical constituents released into the environment would exceed threshold amounts.

No water resources occur within 500 feet of the target area, or roads, so range clearance and target and road maintenance activities would not impact water resources. Mowing, bush hogging, and herbicide use for vegetation control on the test area would not occur within 100 feet of either stream, so no erosion or contamination issues would be anticipated.

Mission operations and range maintenance and clearance would not involve any activity that would increase flooding potential. Eglin institutes a number of requirements to limit the potential for impacts to groundwater, surface waters, and wetlands from mission and range clearance and maintenance activities (see Section 3.9.2.1, General Impacts to Water Resources). Thus, No Action Alternative activities at TA A-78 would have no significant impacts on water resources.

3.9.2.2.2 TA A-79

Panther Creek runs through the central portion of the range approximately 1,100 feet from the borrow area. No water resources occur within 500 feet of the borrow pit; therefore, range clearance and road maintenance activities would not impact water resources. Mowing, bush hogging, and herbicide use for vegetation control on the test area would not occur within 100 feet of the creek, so no erosion or contamination issues would be anticipated.

Mission operations and range maintenance and clearance would not involve any activity that would increase flooding potential. Eglin institutes a number of requirements to limit the potential for impacts to groundwater, surface waters, and wetlands from mission and range clearance and maintenance activities (see Section 3.9.2.1, General Impacts to Water Resources). Thus, No Action Alternative activities at TA A-79 would have no significant impacts on water resources.

3.9.2.2.3 TAs A-73, A-77, A-90, B-7, and B-12

Eglin institutes a number of requirements to limit the potential for groundwater contamination (see Section 3.9.2.1.1, Groundwater), and no floodplains, wetlands, or surface waters occur on or near TAs A-73, A-77, A-90, B-7, or B-12. Therefore, No Action Alternative activities at these sites would have no effect on water resources.

3.9.2.2.4 TA B-70

Live Oak Creek runs through the central portion of the test area with an associated floodplain. The creek is heavily vegetated on both sides to the east and west where the creek traversed the range. Several other dissected floodplains are located northeast within range boundaries. Due to a lack of significant water resources within the test area or in the vicinity of any of the centrally located target areas, there would be no impacts to water resources. According to Section 3.5 (Geology and Soils), it is not expected that the chemical constituents released into the environment would exceed threshold amounts.

No water resources occur within 500 feet of the target areas, so range clearance and target and road maintenance activities would not impact water resources. Mowing, bush hogging, and herbicide use for vegetation control on the test area would not occur within 100 feet of the streams or floodplains, so no erosion or contamination issues would be anticipated.

Mission operations and range maintenance and clearance would not involve any activity that would increase flooding potential. Eglin institutes a number of requirements to limit the potential for impacts to groundwater, surface waters, and wetlands from mission and range clearance and maintenance activities (see Section 3.9.2.1, General Impacts to Water Resources). Thus, No Action Alternative activities at TA B-70 would have no significant impacts on water resources.

3.9.2.2.5 TA B-71

Intermittent streams are present within the north central portion of TA B-71. Flood plains and tributaries surround the test area to the northeast, east and southern portions of the range but are not near the target area in the central part of the range. Due to a lack of significant water resources at the test area, there would be no impacts to water resources. According to Section 3.5 (Geology and Soils), it is not expected that the chemical constituents released into the environment would exceed threshold amounts.

No water resources occur within 500 feet of the target area, or roads, so range clearance and target and road maintenance activities would not impact water resources. Mowing, bush hogging, and herbicide use for vegetation control on the test area would not occur within 100 feet of either stream, so no erosion or contamination issues would be anticipated.

Mission operations and range maintenance and clearance would not involve any activity that would increase flooding potential. Eglin institutes a number of requirements to limit the potential for impacts to groundwater, surface waters, and wetlands from mission and range clearance and maintenance activities (see Section 3.9.2.1, General Impacts to Water Resources). Thus, No Action Alternative activities at TA B-71 would have no significant impacts on water resources.

3.9.2.2.6 TA B-75

Two distinct streams are present along the northern and southern boundaries primarily outside of TA B-75. Flood plains bracket the test area to the north and southern portions of the range. Due to a lack of significant water resources within the test area or in the vicinity of any of the centrally located target areas, there would be no impacts to water resources. According to Section 3.5 (Geology and Soils), it is not expected that the chemical constituents released into the environment would exceed threshold amounts.

No water resources occur within 500 feet of the target areas, so range clearance and target and road maintenance activities would not impact water resources. Mowing, bush hogging, and herbicide use for vegetation control on the test area would not occur within 100 feet of the streams or floodplains, so no erosion or contamination issues would be anticipated.

Mission operations and range maintenance and clearance would not involve any activity that would increase flooding potential. Eglin institutes a number of requirements to limit the potential for impacts to groundwater, surface waters, and wetlands from mission and range clearance and maintenance activities (see Section 3.9.2.1, General Impacts to Water Resources). Thus, No Action Alternative activities at TA B-75 would have no significant impacts on water resources.

3.9.2.2.7 TA B-82

A prominent tributary is present along the eastern boundary outside of TA B-82. Flood plains and tributaries surround the test area to the northeast, northwest and eastern portions of the range but are not near the test and target areas in the southern or central part of the range. Due to a lack of significant water resources within the test area or in the vicinity of these features, there would be no impacts to water resources. According to Section 3.5 (Geology and Soils), it is not expected that the chemical constituents released into the environment would exceed threshold amounts.

No water resources occur within 500 feet of the target area, or roads, so range clearance and target and road maintenance activities would not impact water resources. Mowing, bush hogging, and herbicide use for vegetation control on the test area would not occur within 100 feet of the tributary, so no erosion or contamination issues would be anticipated.

Mission operations and range maintenance and clearance would not involve any activity that would increase flooding potential. Eglin institutes a number of requirements to limit the potential for impacts to groundwater, surface waters, and wetlands from mission and range clearance and maintenance activities (see Section 3.9.2.1, General Impacts to Water Resources). Thus, No Action Alternative activities at TA B-82 would have no significant impacts on water resources.

Table 3-57. Potential Impacts on Water Resources from Testing and Training Activities Under the No Action Alternative

Test Area	Munitions							Explosives/Pyrotechnics (Number of Expenditures or Detonations)					Miscellaneous Explosive Components		
	Large Ordnance (e.g., MK-66 Practice Bomb)		Large Cartridge (e.g., 105-mm Round)		Medium Cartridge (e.g., 40-mm Round)		Small Cartridge (Small Arms, e.g., Rifle, Pistol)	Mines	Grenade	Simulators	C-4	Rocket/Missile	Smoke/Flare	Fuze, Igniter, Propellant, Primer, Powder, Blasting Cap, Detonator	Electromagnetic Radiation
	Gnd	A/G	Gnd	A/G	Gnd	A/G	Gnd	Gnd	Gnd	Gnd	Gnd	A/G, Gnd	Gnd	Gnd	NA
A-73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
A-77	0	-	-	-	-	-	-	0	-	-	0	-	0	0	0
A-78	0	-	-	-	-	-	-	0	0	-	0	-	0	0	0
A-79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-7	0	-	0	-	-	-	-	0	0	0	0	0	0	0	0
B-12	0	0	0	0	0	0	-	0	-	-	0	0	0	-	-
B-70	-	-	-	-	0	-	-	-	0	-	-	-	0	-	-
B-71	-	0	-	0	0	0	0	0	-	0	-	0	0	-	-
B-75	0	0	0	-	-	-	-	0	-	0	-	-	0	-	-
B-82	0	-	0	0	0	0	0	0	0	0	-	0	0	-	-

A/G = air-to-ground; GRD = ground; mm = millimeter
Note: Description for symbols is provided in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

Table 3-58. Potential Impacts on Water Resources from Test Area and Road Maintenance Associated With Each Test Area Under the No Action Alternative

Test Area	Fixed- and Rotary-Wing Aircraft	Detonation Cord/C-4	Herbicides	Dismounted Maneuver	Wheeled Vehicles	Wheeled Heavy Equipment	Tracked Heavy Equipment	Generators/Small Equipment	Point Impact—Land Disturbance	Incidental Surface Disturbance	Land Clearing	Plowing and Earth Moving	Culvert/Bridge/Ford Materials	Fill Dirt	Chainsaw/Tree Cutter	Biological Controls
A-73	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
A-77	0	0	-	-	0	0	0	-	-	-	-	-	0	0	0	0
A-78	0	0	-	-	0	0	0	-	-	-	-	-	0	0	0	0
A-79	0	0	-	-	0	0	0	-	-	-	-	-	0	0	0	0
A-90	0	0	-	-	0	0	0	-	-	-	-	-	0	0	0	0
B-7	0	0	-	-	0	0	0	-	-	-	-	-	0	0	0	0
B-12	0	0	-	-	0	0	0	-	-	-	-	-	0	0	0	0
B-70	0	-	-	-	0	0	0	-	-	-	-	-	0	0	0	0
B-71	0	-	-	-	0	0	0	-	-	-	-	-	0	0	0	0
B-75	0	-	-	-	0	0	0	-	-	-	-		0	0	0	0
B-82	0	-	-	-	0	0	0	-	-	-	-	-	0	0	0	0

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences).

3.9.2.3 Alternative 1 (Current Plus Future)

3.9.2.3.1 TAs A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82

Under Alternative 1, which includes current plus proposed activities, the ongoing activities described under the No Action Alternative would not significantly impact water resources on these ranges. There are no major construction projects planned for these test areas. It is anticipated that there could be occasional minor construction, either facility, target structure, or land clearing under Alternative 1.

Test area and road maintenance under Alternative 1 would be the same as for the No Action Alternative. Maintenance actions would potentially include routine retrieval and disposal of UXO and range debris, clearance activities, target management, vegetation management, and maintenance of range access/control infrastructure.

Alternative 1 includes typical minor future construction, demolition, renovation, and facility modifications that could potentially occur over the next 7 years. These activities would be located within existing range profiles, and all management actions described in this EA would be followed (refer to Section 3.9.2.5, Management Actions). These types of actions would be reviewed for environmental concerns through the EIAP using AF Form 813 (Request for Environmental Impact Analysis).

Training, ordnance use, fixed-wing and rotary-wing aircraft, road and test area maintenance, debris cleanup, and vegetation control activities would be conducted in accordance with established procedures in currently approved areas only. Land clearance, construction, or renovation activities would require adherence to current regulations, including an NPDES permit for any proposed ground disturbance over 1 acre. Test area and road maintenance activities are conducted in accordance with base BMPs on a quarterly basis and include road grading, target replacement, and mowing.

3.9.2.3.2 TA A-73

Alternative 1 evaluates authorizing two new radar systems in TA A-73. Potential impacts to water resources would be like those addressed in the EMR EA (DAF, 2017a).

Table 3-59. Potential Impacts on Water Resources from Future Actions Under Alternative 1

Test Area	Facility Construction	Target Structure	Land Clearing	Radar	Air-to-Ground Small Ordnance
A-73	0	0	0	-	0
A-77	-	0	-	0	0
A-78	-	0	-	0	0
A-79	-	0	-	0	0
A-90	-	0	-	0	0
B-7	-	0	-	0	0
B-12	-	0	-	0	0
B-70	-	-	-	0	0
B-71	-	0	-	0	0
B-75	-	-	-	0	0
B-82	-	0	-	0	0

Note: Description for symbols is presented in the introduction to Chapter 3 (Affected Environment and Environmental Consequences.

3.9.2.4 Cumulative Effects

Water resources may be impacted by sedimentation, contamination, and hydrologic alteration caused by past, ongoing, and future testing and training missions; land clearing; construction; natural resources management; range clearance and maintenance activities; mission activities; range clearance operations; maintenance and repair activities; and construction projects. Permits and management practices, such as those described in Section 3.9.2.5 (Management Actions), would minimize impacts potentially resulting from these activities. Thus, there would be no significant cumulative impacts to water resources.

3.9.2.5 Management Actions

The following management actions would be implemented for testing and training activities:

- Follow restrictions in EAFBMAN 13-212.
- 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 Eglin.
- Within 100 feet of streams, water bodies, and wetlands:
  - Non-lethal small arms ammunition is allowed, but star clusters (handheld slap flares) are the only approved pyrotechnics in these areas.
  - No vegetation cutting.
  - No off-road driving, digging, or other ground-disturbing activities outside of previously disturbed roadbeds and road shoulders.
  - No refueling or lubricating of equipment.
- Do not release chemicals or metals into streams, wetlands, or water bodies.
- Follow Eglin spill prevention and spill response procedures.
- Conduct maintenance and refueling at cantonment areas as much as possible.
- Disposal/discharge of hazardous materials to the ground or in water is prohibited.
- Minimize water consumption from streams; water purification and withdrawals in excess of 500 gallons must be approved through the 96th Operations Support Squadron office.
- Do not dam or divert water from streams or wetlands.
- Restore any damage from fire suppression activities according to guidelines in the *Eglin AFB Wildland Fire Management Plan*.

The following management actions would be implemented for range clearance and target, road, and vegetation maintenance activities:

- Follow requirements in AFMAN 13-212.
- Notify the Environmental Planning Office prior to in-water work and activities in riparian, floodplain, and wetland areas to determine necessary permits and other requirements.
- For work in and near wetlands and streams, follow permit requirements, minimize disturbance as much as possible, and employ measures to minimize erosion and contain

sedimentation (i.e., sediment curtains). Stabilize the site immediately after work completion with vegetation, berms, riprap, or other appropriate measures.

- Coordinate work at crossings and road approaches with the Natural Resources Office, Transportation Networks and Airfield Pavements Facility Manager (or designee) to ensure biological and engineering concerns are adequately considered.
- Prior to field operations, maintenance/repair personnel and contractors must view a briefing on the requirements in this EA, and applicable requirements from EAFBMAN 13-212.
- Avoid off-road ground-disturbing activities in areas with slopes greater than 15 percent, or within 100 feet of streams, water bodies, and wetlands, at a minimum.
- During road and crossing work, implement best practices to address erosion and hydrologic issues. Key practices include:
    - Add fill to raise the road profile slightly above natural ground elevation.
    - Reshape the road prism to a crown.
    - Excavate roadside drainage turnouts.
    - Construct slope terraces to intersect and discharge sheet flows.
    - Mechanically shape disturbed roadside slopes.
    - Establish vegetation to stabilize road shoulders and ditches.
    - Stabilize the road prism with aggregate and geotextile materials.
    - Excavate roadside berms that were created by grading.
- Avoid deposition of soils in streams, wetlands, and water bodies.
    - Avoid grading of dirt onto bridges and paved road approaches.
    - Avoid creation of turnouts and other drainage/discharge features that divert stormwater flows toward wetlands or streams.
- Do not deposit or discharge petroleum products, hazardous materials, or hazardous waste to the ground or in water. Follow Eglin spill prevention and spill response procedures. Comply with Eglin AFB Instruction 32-7002, *Environmental Compliance and Pollution Prevention, Hazardous Waste Management*.
- Do not conduct refueling or lubricating of equipment within 100 feet of a stream, wetland, or water body.
- During any necessary ordnance or debris removal in or near wetlands or surface waters, employ minimally ground-disturbing techniques and do not use vehicles on slopes.
- Apply herbicides in accordance with DAF requirements and the *Long-Term Vegetation Control Environmental Assessment* (DAF, 2008a).
- Actively participate in the MLTTAP and coordinate planned maintenance/repair with the MLTTAP as necessary.
- Eglin will cooperate with AFCEC to fulfill its Sustainment Management System responsibilities for the range road and training asset network to ensure compliance with applicable AFIs and the *Air Force Comprehensive Asset Management Plan Playbook* and business rules.

The following management actions would be implemented for land clearing and construction activities:

- Notify the Environmental Planning Office prior to land clearing or construction work to determine necessary permits and other requirements.
- For work potentially affecting surface waters or wetlands, minimize disturbance as much as possible, follow permit requirements, and employ measures to minimize erosion and sedimentation. Stabilize the site immediately after work completion with vegetation, berms, riprap, or other appropriate measures.
- Do not conduct land clearing or construction (including target construction) near streams, wetlands, and water bodies.
- Maintain a vegetated buffer of 100 feet around streams, wetlands, and water bodies.
- Avoid ground-disturbing activities in areas with slopes greater than 15 percent.
- Follow Eglin spill prevention and spill response procedures and report all spills and accidental discharges to Eglin 96 CEG/CEIEC Environmental Compliance Office.

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APPENDIX A
EGLIN A AND B RANGES BIOLOGICAL RESOURCES

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EGLIN A AND B RANGES BIOLOGICAL RESOURCES

A.1 AFFECTED ENVIRONMENT

A.1.1 Ecological Associations

The primary ecological associations that occur in the region of influence (ROI) consist of sandhills, pine flatwoods, wetlands, and grasslands/shrublands. Summary descriptions of these associations are provided below. Detailed descriptions of these and other natural communities of Florida are provided in the Florida Natural Areas Inventory *Guide to the Natural Communities of Florida* (FNAI, 2010).

The sandhills association is the most extensive of the natural community types found on Eglin Air Force Base (AFB), making up about 80 percent of the installation (Eglin AFB, 2022). Sandhills are associated with the deep sands of the southeastern United States (US) coastal plain ecoregion, occurring on crests and slopes of rolling hills and ridges with steep or gentle topography (FNAI, 2010). On Eglin AFB, longleaf pine sandhills are characterized by an open, savanna-like structure with a moderate to tall canopy of longleaf pine (*Pinus palustris*), a sparse midstory of oaks (*Quercus* spp.) and other hardwoods, and a groundcover of mainly grasses, forbs and low-growing shrubs. The dominant grass species consists either of wiregrass (*Aristida stricta*) or Florida bluestem (*Andropogon floridanus*). Structure and composition are maintained by frequent fires, which control encroachment of other tree species such as sand pine (*P. clausa*) and swamp titi (*Cyrilla racemiflora*). The sandhill matrix contributes to regional biodiversity and provides the matrix across which fire carries into the other embedded fire-dependent systems on and near the installation. Relatively small portions of the sandhill association are considered pine plantation, which are areas where pines have been planted. Most of these areas contain longleaf pines that have been planted to restore native habitat. Some plantation areas are intended for timber production and primarily contain slash pines (*P. elliotti*) or sand pines. Plantation stands can function as wildlife habitat, forage areas, and movement corridors.

Pine flatwoods occur on flat, moderately well drained, sandy soils with varying levels of organic matter, often underlain by a hardpan that impedes drainage. Flatwoods may be characterized as wet, mesic, or dry, depending on local hydrology. While the canopy consists of slash pine and longleaf pine, the understory varies greatly from shrubby to an open understory of grasses and herbs. Like the sandhill ecosystem, the flatwoods matrix is important in maintaining regional biodiversity. Some flatwoods areas, located mostly near the perimeter of the installation, consist of pine plantation.

Wetlands are areas of transition between terrestrial and aquatic systems where the water table is usually at or near the surface or where the land is covered by shallow water. Wetlands are productive ecosystems that provide food and shelter for many different species. Large numbers of plant, insect, amphibian, reptile, bird, fish, and mammal species can be found living in this habitat. Through a combination of high nutrient levels, fluctuations in water depth, and primary productivity of plant life, wetlands provide the basis for a complex food web that supports the foraging habits of numerous animals for part of or all their life cycle. During migration and breeding, some bird and mammal species rely on wetlands for food, water, and shelter. Wetlands are described in the context of hydrology in Section 3.8.2.2 (Water Resources). Riparian zones are biologically diverse transition areas between wetland and terrestrial habitats. Riparian areas are associated with water features such as rivers, streams, or creeks. Vegetation and soils in riparian zones act as water filters, intercepting surface water runoff and storing floodwaters during floods. Riparian areas may support a high diversity of aquatic and terrestrial species.

Open grasslands/shrublands occur in areas of heavily disturbed sandhills, flatwoods, and wetlands/riparian sites. This habitat type, characterized by grasses, low shrubs, and young trees, predominantly occurs within the test areas on Eglin AFB. Eglin maintains this habitat with machinery or fire that removes or prevents future growth. Urban/landscaped areas predominantly occur on Eglin Main Base but may also occur on small portions of test areas. Bahia grass (*Panicum notatum*), St. Augustine grass (*Stenotaphrum secundatum*), and centipede grass (*Eremochloa ophiuroides*) are typically used as groundcover in improved and semi-improved areas.

A.1.2 Protected Species

Summary descriptions of protected species that occur in the ROI are provided below. Additional information is provided for some species in Eglin's *Integrated Natural Resources Management Plan* (INRMP) (Eglin AFB, 2022) and *Final Threatened and Endangered Species Component Plan Update* (Eglin AFB, 2020a).

Reticulated Flatwoods Salamander. The reticulated flatwoods salamander (*Ambystoma bishopi*) is federally and state-listed as endangered. The flatwoods salamander has been separated into two species. The division lies along the Apalachicola-Flint Rivers, with reticulated flatwoods salamanders (*A. bishopi*) inhabiting areas to the west and frosted flatwoods salamanders (*A. cingulatum*) occurring east of the rivers. The Eglin Reservation supports about 17,000 acres of potential salamander habitat, with 27 known breeding wetlands (Eglin AFB, 2020a). Eglin has distinct geographic areas where suitable breeding habitat is present and either currently contains, historically contained, or likely historically contained flatwoods salamander populations. Except for a few outlying wetlands, the majority of flatwoods salamander habitat occurs within the following geographic areas: East Bay flatwoods, Oglesby/Alligator Creek, Pond 41 Complex, Whitmier Island, Basin Landing, and Basin Bayou. In the last several years, reproduction has only been documented at East Bay and Oglesby/Alligator Creek. Habitat within the Eastbay Flatwoods and Oglesby/Alligator Creek areas are the primary focus for recovery efforts; Whitmier Island, Basin Bayou, and Pond 41 are considered supplementary habitat areas.

Optimal habitat for this species is open, mesic (moderately wet) woodlands of longleaf pine or slash pine flatwoods maintained by frequent fires and that contain shallow, ephemeral wetland ponds. Males and females migrate to these wetlands during the cool, rainy months of October through December to breed. The females lay their eggs in vegetation at the edges of the ponds. Flatwoods salamanders may disperse long distances from breeding sites to upland sites where they live as adults during the non-breeding season. The primary threat to the flatwoods salamander is loss of mesic habitat through the filling in of wetlands and other alterations to the landscape hydrology. In addition, many historical and potential breeding ponds have become overgrown with hardwood midstory (Eglin AFB, 2020a). Flatwoods salamander habitat is also threatened by the introduction of invasive, nonnative species.

Eglin's goal is to maintain and recover flatwoods salamander populations within the core geographic areas of Eastbay Flatwoods and Oglesby/Alligator Creek. Accordingly, Eglin prepared a Conservation Plan (DAF, 2017a) for the flatwoods salamander as part of an Endangered Species Act (ESA) Section 7(a)(1) agreement (USFWS, 2017). The agreement documents voluntary planning and management that will be undertaken by Eglin within the Escribano Point Water Management Area, with funding provided by the Readiness and Environmental Protection Integration program and in partnership with the Florida Fish and Wildlife Conservation Commission. With a commitment to off-site salamander recovery, Eglin anticipates a reduction in the ESA regulatory footprint on Department of the Air Force (DAF) property while significantly contributing to the species' recovery over its historical range. Previously, all known and potential breeding ponds were treated equally with respect to habitat management and military mission activities. Efforts to protect the species and its habitat led to the observation of a 1,500-foot buffer area from the edge of these sites. Within the buffer area, ground-disturbing activities are restricted to minimize the potential for direct impacts to salamanders, the introduction and spread of invasive nonnative plant species, and alterations to hydrology and water quality.

With implementation of the Recovery Plan, Eglin has changed the policy concerning restrictions to potential breeding sites outside of Eastbay Flatwoods and Oglesby/Alligator Creek. The 1,500-foot buffer area now applies only to ponds within the Oglesby/Alligator Creek and Eastbay Flatwoods geographic areas, as these areas are the primary focus of restoration and population recovery activities. Breeding ponds outside of these areas do not contain extant populations of flatwoods salamander. Restrictions in Eglin AFB Manual 13-212, regulatory constraints from the Clean Water Act, and silvicultural best management practices are believed to provide adequate protection from significant alteration for all ponds outside of Oglesby/Alligator Creek and Eastbay Flatwoods. Breeding ponds outside of the primary focus areas may be utilized for future population expansion efforts, but the efforts would be deemed "experimental" and not incur any regulatory burden to testing and training missions. Geographic areas in the vicinity of Eglin AFB have been designated as reticulated flatwoods salamander critical habitat. However, because the species is protected by measures in the base's INRMP, Eglin AFB property is exempted from critical habitat designation.

Red-Cockaded Woodpecker. The red-cockaded woodpecker (RCW) (*Dryobates borealis*) is federally and state-listed as threatened. The US Fish and Wildlife Service (USFWS) reclassified (downlisted) the RCW from endangered to threatened in October 2024 (89 *Federal Register* 85294). The RCW excavates cavities in live longleaf pine trees that are at least 85 years old. Due to the preservation of continuous longleaf pine forests on Eglin AFB, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, the USFWS identified Eglin as 1 of 13 primary core populations for the RCW (USFWS, 2003). Per the Eglin AFB INRMP, *Final Threatened and Endangered Species Component Plan Update* (Eglin AFB, 2020a), the RCW population on Eglin reached the designated recovery goal of 350 potential breeding groups (PBGs) in 2009 and its overall population goal of 450 PBGs in 2016. The current population size is 546 active clusters and 507 PBGs. The Eglin population is divided into two subpopulations: the eastern subpopulation, which comprises all clusters east of Highway 85, and the western subpopulation, which comprises all clusters west of Highway 85. The western portion of the population has surpassed the overall goal of 350 PBGs and the eastern portion has surpassed the goal of 100 PBGs.

RCWs feed mostly on insects found on or within the bark of pine trees. High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height averaging 10 inches or larger, forbs and bunchgrasses in the understory, and sparse or no hardwood midstory. Depending on site productivity, different amounts of foraging habitat are required. While 100 acres of mature pine is sufficient for some groups, birds commonly forage over several hundred acres where habitat conditions are not ideal (Jackson, Lennartz, & Hooper, 1979). Site conditions at Eglin AFB are generally considered poor and, therefore, birds forage over relatively large areas. The greatest threat to the RCW is habitat loss and fragmentation.

Eastern Indigo Snake. The eastern indigo snake (*Drymarchon corais couperi*), federally and state-listed as threatened, is the largest nonvenomous snake in North America. The primary reason for its listing is population decline resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats exposes the snake to danger from increased contact with humans. Indigo snakes frequently utilize the burrows of gopher tortoises and other species for overwintering. The snake often occurs in flatwoods, hammocks, stream bottoms, riparian thickets, and high ground with well-drained, sandy soils. The indigo snake could occur anywhere on the Eglin Range because it uses such a wide variety of habitats. However, the species is extremely uncommon, with only 29 sightings of indigo snakes on the Eglin Range from 1956 to 1999 and no reported sightings since 1999 (Eglin AFB, 2020a). Most of the snakes were seen crossing roads or after being killed by vehicles.

Tricolored Bat. The tricolored bat (*Perimyotis subflavus*) was proposed for listing as endangered under the ESA in September 2022. The species occurs across the eastern and central United States, and is known to occur on Eglin AFB. During winter, these bats hibernate mostly in caves and mines, but individuals may use other structures such as culverts in areas where caves are uncommon (USFWS, 2023a). During spring, summer, and fall, tricolored bats occur in wooded areas where they roost primarily in trees, although they may also use structures such as buildings and bridges. Tricolored bats feed between dusk and dawn on a wide variety of flying insects. Foraging typically occurs near trees (including forest edges), along waterways, and in riparian habitat. The greatest threats to the species are white-nose syndrome and mortality associated with wind energy turbine strikes. White-nose syndrome is currently not known to be present in Florida (University of Florida, 2021).

Alligator Snapping Turtle. The alligator snapping turtle (*Macrochelys temminckii*), a state species of special concern, was proposed for listing as threatened under the ESA (with a Section 4(d) rule) in November 2021 (86 *Federal Register* 62434). The species occurs from Florida (Panhandle and Big Bend regions) to Texas (FWC, 2023a). Individuals may occur in rivers, lakes, backwater swamps, and brackish water systems. Alligator snapping turtles may use seepage streams on Eglin AFB (FWC, 2011). Young turtles primarily consume fish. The diet of adults is varied and includes fish, crustaceans, salamanders, birds, mammals, and other turtles. In the ROI, nesting occurs from April to May in sandy soils near water. Primary threats to this species are harvest, fishing bycatch, hook ingestion, habitat alteration, and nest predation (USFWS, 2023b).

Monarch Butterfly. The USFWS proposed to list the monarch butterfly (*Danaus plexippus*) as threatened under the ESA (with a Section 4(d) rule) in December 2024 (89 *Federal Register* 100662). The USFWS also proposed to designate critical habitat in areas of California. This widely distributed species is composed of migratory and non-migratory populations (USFWS, 2020a). The eastern North America population migrates annually between Canada and forested overwintering sites in central Mexico (USFWS, 2022a). Monarchs leave overwintering areas in Mexico during early spring (February to March), breeding as they travel northward and depositing eggs on milkweed host plants. Occurrence in the ROI extends from about March to November. The number of southward-migrating individuals observed in areas of the Florida Panhandle (e.g., St. Marks National Wildlife Refuge) peaks between October and November. Adults feed on milkweed and a variety of other blooming nectar resources. Primary threats to the species are habitat loss and insecticide exposure.

Okaloosa Darter. The state-designated threatened Okaloosa darter (*Etheostoma okaloosae*), which was removed from the federal list of endangered and threatened species in June 2023 due to recovery, is a small fish that inhabits streams fed by groundwater seepage. Spawning occurs from March to October, with the greatest amount of activity taking place during April. The entire population of this species is found in the tributaries and main channels of the following creeks, which drain into two bayous of Choctawhatchee Bay: Toms, Turkey, Mill, Swift, Turkey-Bolton (also known as East Turkey), and Rocky Creeks. These seepage streams have persistent discharge of clear, sand-filtered water through sandy channels, woody debris, and vegetation beds. The Eglin Range contains 90 percent of the drainage area. Darters are usually found in and around root masses of streamside vegetation and woody debris. Primary threats to the Okaloosa darter are hydrologic alteration, siltation, and temperature alteration from beaver dams, roads, culverts, and urbanized areas (USFWS, 2022b). Additional issues are prescribed fire and/or wildfire breaks that change or alter hydrologic stream flow. Okaloosa darter streams do not occur on any test areas of the ROI, but occur within about 6,000 to 12,000 feet of portions of Test Areas (TAs) B-70, B-71, and B-82.

Gopher Tortoise. The gopher tortoise (*Gopherus polyphemus*) is a state-designated threatened species. In 2022, the USFWS determined that listing of the eastern distinct population segment of the species (east of the Tombigbee and Mobile Rivers) under the ESA is not warranted. All Department of Defense (DoD) entities, including the DAF, as well as state agencies and nongovernmental organizations, signed a Candidate Conservation Agreement with the USFWS in 2008 (updated in 2012). This agreement defines what each agency will voluntarily do to conserve the gopher tortoise and its habitat. In 2020, the USFWS issued a Conference Opinion, which identifies conservation measures related to activities conducted on Eglin AFB (USFWS, 2020b).

The gopher tortoise is found primarily within the sandhills and open grassland ecological associations on the Eglin Range, where it excavates a tunnel-like burrow for shelter from predators, fire, and temperature extremes. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (grasses and legumes). Nesting occurs during May and June, and hatching occurs from August through September. Gopher tortoise burrows serve as important habitat for many other species, including the ESA-listed eastern indigo snake. Primary threats to the species are habitat loss (e.g., fire suppression), non-intentional mortality (e.g., vehicle strikes), predation, and disease. Although Eglin has identified some areas where gopher tortoises are found, comprehensive surveys of the installation have not been conducted. Therefore, population estimates on Eglin AFB are not available.

Florida Pine Snake. The state-designated threatened Florida pine snake (*Pituophis melanoleucus mugitus*), one of the largest snakes in eastern North America, occurs throughout most of the state (FWC, 2023b). The species inhabits areas with well-drained sandy soils and a moderate to open canopy, including sandhills, former sandhill areas, pine scrub, and scrubby flatwoods (FNAI, 2001). Pine snakes consume primarily moles, rabbits, mice, rats, squirrels, lizards, and other snakes and their eggs. Nesting occurs from June to August, with the eggs hatching in September and October.

Southeastern American Kestrel. The state-designated threatened southeastern American kestrel (*Falco sparverius paulus*) is a subspecies of kestrel that is nonmigratory and resides year-round in Florida. In recent decades, this species has undergone a marked population decline due primarily to loss of native habitat (especially longleaf pine) that is essential for foraging and nesting (FWC, 2023c). The southeastern American kestrel's habitat in Florida includes open woodlands, sandhills, fire-maintained savannah pine habitats, and riparian areas. Kestrels prefer open or partly open sandhills habitat. On Eglin AFB, kestrels frequently utilize cleared test areas as foraging areas. The species may also use alternative habitats such as pastures and open fields located in residential areas. Diet primarily consists of insects, lizards, spiders, frogs, and small mammals. Breeding occurs from March through June.

Kestrels nest in cavities that have been excavated in large trees, including longleaf pines, by woodpeckers or squirrels. Kestrels also use nest boxes, which have become an important artificial habitat due to the loss of primary habitats. Southeastern American kestrels were found to primarily use natural large secondary cavities for nesting on Eglin AFB (Blanc & Walters, 2008).

Little Blue Heron. The state-designated threatened little blue heron (*Egretta caerulea*) is a small wading bird that is relatively common in peninsular Florida but somewhat rare in the Panhandle (FWC, 2023d). The species occupies fresh, salt, and brackish water environments in Florida including swamps, estuaries, ponds, lakes, and rivers. Diet primarily consists of fish, insects, shrimp, and amphibians. Little blue herons may feed among floating vegetation. Breeding and nesting occur in colonies near freshwater and marine-estuarine habitats. The little blue heron may potentially occur in riparian habitats of the ROI.

Florida Burrowing Owl. The state-designated threatened Florida burrowing owl (*Athene cunicularia floridana*) occurs in open habitats that generally do not contain trees (FWS, 2023e). The species spends most of its time on the ground. Burrowing owls either dig their own burrows or use abandoned gopher tortoise burrows, which are used for roosting during winter and for raising young during the breeding season (April/May to July/August). These owls are active in the day during breeding season but are more nocturnal at other times. On Eglin AFB, burrowing owls have been observed primarily on TA B-70 but also on TAs B-71, B-75, C-62, and C-52. Habitat is incidentally maintained by range maintenance and mowing, prescribed fire and wildfire, and herbicide application. Threats to the species include habitat loss, predation, and vehicle strikes.

Migratory Birds. Migratory birds are defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. Migratory birds include most wild birds in the United States except the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), feral pigeons, and resident game birds (e.g., quail species). In the regulatory context of the Migratory Bird Treaty Act (MBTA), a migratory bird belongs to a family or group of species for which the United States has signed migratory bird treaties with certain other nations (USFWS, 2020c). A full list of species protected under the MBTA is available in 50 Code of Federal Regulations, Section 10.13. The USFWS identifies nongame migratory birds that, without additional conservation actions, are likely to become candidates for listing under the ESA (USFWS, 2024a); these species are known as Birds of Conservation Concern (BCC).

Numerous migratory birds occur in the ROI, although Eglin is not considered an important stopover area or concentration site for neotropical migratory species (birds that winter in the Caribbean and South and Central America and migrate to more temperate regions during summer) in the spring or fall (Tucker, Hill, & Holler, 1996). In general, birds migrating along the Gulf coast in spring and fall are concentrated in areas near (but not on) the coast and in structurally diverse areas with relatively high tree canopy (e.g., bottomland hardwood forests and coastal forests) (Buler & Moore, 2011; Gautreaux & Moore, 2013; La Puma & Buler, 2013). Some survey results indicate birds are more concentrated in forested areas during fall migration and are more widely distributed and nearer the coast during the initial spring stopover. Breeding neotropical migrants at Eglin AFB are primarily found in riparian, hammock, and barrier island areas, which serve as temporary habitat. Neotropical migrants are more common in areas of Eglin AFB during fall migration than spring migration (Tucker et al., 1996).

The USFWS Information for Planning and Consultation system was queried to obtain a list of migratory birds potentially occurring on Eglin AFB (USFWS, 2024b). The results indicate that 50 species, many of which are BCC, may occur at various times of the year, although some types of birds (e.g., shorebirds and seabirds) would not typically be expected on the test areas. Thirty-nine migratory bird species potentially occurring on the installation were identified in a previous Environmental Assessment (EA) prepared for activities conducted at certain test areas (DAF, 2017b). The ROI is located within Bird Conservation Region 27 (Southeastern Coastal Plain) and adjacent to Bird Conservation Region M20 (Gulf of Mexico). The *Birds of Conservation Concern 2021, Migratory Bird Program* report provides a map showing these regions, as well as lists of the BCC within each region (USFWS, 2021).

A.2 ENVIRONMENTAL CONSEQUENCES

Potential impacts to biological resources were considered in the context of general impact categories, which consist of direct strikes, habitat alteration, noise and other harassment, and introduction or spread of invasive species. Descriptions of these categories are provided below.

A.2.1 Direct Strike

A direct strike refers to the physical harm that can occur to an organism because of testing, training, or maintenance activities. Direct impacts to wildlife and vegetation could result from direct strike by expendables (e.g., ordnance, small arms ammunition, medium- and large-caliber rounds, explosives, and pyrotechnics), foot traffic (trampling), operation of vehicles or other equipment (crushing or direct strike), direct exposure to fires, and exposure to electromagnetic radiation (EMR).

Expendables such as live and inert bombs, rockets, ammunition, and explosives may potentially impact vegetation and wildlife by direct strike, shrapnel, or exposure to the pressure wave produced by an explosion. Potential impacts resulting from physical contact with a biological resource include damage, injury, and mortality. Vegetation located near target areas could be damaged or killed. Wildlife living in or moving through an impact area at the same time a detonation occurred or munitions intersected its path could be injured or killed. Most mission activities involving such expendables are concentrated in areas that are already disturbed, with munitions aimed at cleared target areas. These areas generally do not contain sensitive vegetation and are not high-quality habitat for most wildlife species. Pre-mission activities associated with some testing and training may temporarily discourage wildlife from remaining in or entering an affected area, thus minimizing the potential for direct impacts. Most munitions would hit or land near their intended targets. Overall, the likelihood of directly impacting wildlife during most missions on the test areas is generally low.

Vegetation and wildlife may potentially be trampled by foot traffic, as well as crushed or struck by vehicles or other equipment, during testing, training, maintenance activities, and range cleanup. Generally, such activities involve relatively small numbers of people. In addition, testing and training activities typically do not occur in sensitive habitats such as wetlands. In many cases, vegetation that is damaged by these activities would recover over time through natural processes. Although it would be possible for personnel on foot to trample wildlife during testing, training, or maintenance activities, the probability is low. Typically, personnel would easily be able to observe and avoid wildlife in their near vicinity. In addition, most wildlife would perceive human presence and general disturbance, and mobile species would move away from the area before being physically impacted. Vehicles (including motorcycles and all-terrain vehicles, in approved areas) and other equipment could strike animals located on the ground or very near the ground (e.g., a low-flying bird). Mobile animals (e.g., many mammals and adult birds) would likely detect human activities and move away from affected areas before being physically impacted. However, animals that move slowly relative to the speed of a vehicle or other equipment (e.g., gopher tortoises) would be comparatively more susceptible to physical strikes. Off-road driving is generally prohibited on Eglin AFB except in designated areas, reducing the chance for vehicle strikes.

Fires may occur on and near various test areas because of testing, training, and vegetation control activities. Eglin conducts prescribed burning in many areas to keep the ranges clear, manage the potential for mission-related wildfire, and maintain habitats and wildlife populations. Many of the habitats and species on Eglin AFB are dependent on fires that occur at certain time intervals. When fires are too infrequent, landscapes and wildlife, including species protected under the ESA, may be negatively impacted through habitat fragmentation and loss. Such impacts may affect testing and training due to increased potential to jeopardize listed species or requirements for more stringent terms and conditions, which are identified during regulatory consultations. Although prescribed burning is beneficial overall to biological resources on Eglin AFB, some types of missions, such as those involving explosives, live munitions, and pyrotechnics may cause wildfires. Prescribed fires and mission-related wildfires have the potential to move outside test area boundaries. Wildlife could be injured or killed by direct exposure to a fire or by other physical effects such as smoke inhalation. The potential for direct impacts would be influenced by an animal’s physical characteristics, age, health, and behaviors. Relatively mobile species would be more able to avoid direct exposure, while slower-moving species, injured individuals, juveniles, and eggs would more likely be impacted. If fires occur during RCW nesting season or at night, nestlings, fledglings and adults may be affected. Although no documentation of fire-related mortality to gopher tortoises has been identified, it is possible that a tortoise or other species located in its burrow (e.g., eastern indigo snake) during a fire could be asphyxiated. Individual tortoises or egg clutches could be crushed during fire suppression activities such as vehicle operation and fireline plowing. Fire may also result in mortality of indigo snakes and nests, but most snakes would move to underground refugia or adjacent habitats. In some cases, human disturbance could cause wildlife to leave a potentially affected area before a fire started, thereby reducing the likelihood of direct exposure. Missions with the potential to start wildfires would occur in accordance with Eglin's *Wildfire Specific Action Guide* (DAF, 2013), which rates fire danger from low to extreme. In general, activities with relatively high potential to result in fires are restricted on days when environmental conditions are most conducive to fire. Adherence to applicable restrictions would reduce the potential for wildfires and any associated direct impacts to vegetation and wildlife. Table A-1 lists the number of wildfires started by mission activities that occurred on the included test areas over the last 10 years (2014 to 2023). Note that prescribed fires are not included in the totals, although there is potential for such fires to directly impact wildlife and nontarget vegetation as well. Additional information on wildfire management at Eglin AFB is provided in the *Wildland Fire Management Plan* (Eglin AFB, 2020b).

Table A-1. Mission-Related Wildfires on the Eglin A and B Ranges, 2014–2023

Test Area	Number of Mission-Related Wildfires	Year(s) Wildfire Occurred
A-73	0	Not applicable
A-77	26	2014, 2016, 2017, 2018, 2019, 2020, 2022, 2023
A-78	29	2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
A-79	2	2016, 2022
A-90	0	Not applicable
B-7	19	2014, 2015, 2016, 2017, 2019, 2020, 2021, 2022, 2023
B-12	2	2015, 2023
B-70	30	2014, 2015, 2016, 2018, 2019, 2021, 2022, 2023
B-71	12	2014, 2016, 2017, 2018, 2019, 2022
B-75	22	2014, 2015, 2016, 2018, 2019, 2020, 2021, 2022, 2023
B-82	2	2016

The types of EMR that are included in the Proposed Action consist of infrared radiation (IR), millimeter wave (MMW) radiation, and lasers. EMR is typically categorized according to wavelength, with shorter wavelengths corresponding to higher energy levels and greater potential to affect biological receptors. In general, IR is considered to be EMR of wavelengths between 700 nanometers and 1 millimeter (mm), and MMW radiation corresponds to wavelengths between 1 and 10 mm. MMW radiation occurs within the range of wavelengths typically considered microwaves. Lasers are sources of EMR within the infrared, visible, or ultraviolet portions of the electromagnetic spectrum. Light from lasers is coherent, which means that it consists of one wavelength and travels in a tightly focused beam. IR, MMW radiation, and lasers are considered nonionizing radiation because their energy levels are not great enough to remove electrons from atoms or molecules. Ionizing radiation (e.g., X-rays) has the potential to cause comparatively much greater damage to biological tissue.

Although not capable of causing ionization, the energy levels associated with some EMR emitters and lasers can produce changes in the vibrational and rotational energies of biological molecules, which can lead to harmful tissue heating. Such thermal effects, along with associated behavioral responses, have been found in some bird species exposed to EMR in the radio and microwave frequencies. The results of several studies suggest that birds can detect radiofrequency (RF) (consisting of radio waves, microwaves, and some IR frequencies) radiation levels of 5 milliwatts per square centimeter (mW/cm^2) and that behaviors such as avoidance and escape are expected between levels of 10 and 25 mW/cm^2 (Wasserman et al., 1984a; Wasserman et al., 1984b; Chou

& Guy, 1985; Sheridan et al., 2015; Wasserman et al., 1985). Exposure to levels greater than 25 mW/cm^2 results in obvious signs of thermal stress, with thermal effects generally becoming more severe with increasing radiation levels and exposure times. Multiple bat species avoided radar that was operated in a fixed direction but did not appear to be affected when the radar antenna was rotating, likely because the exposure time was reduced (Nicholls & Racey, 2009). Electromagnetic fields may interfere with some birds' navigational ability, which could result in disorientation or changes in flight direction. Researchers found that exposure to EMR affected the ability of European robins (*Erithacus rubecula*) to orient directionally (Engels et al., 2014). This effect is likely associated with a magnetite-based receptor present in some bird species, which provides information on position and compass direction; these species may use Earth's magnetic field lines (among other inputs) to navigate (Wiltschko & Wiltschko, 2005). Disorientation effects are temporary, as electromagnetic pulses do not permanently deactivate the magnetite mechanisms, and birds are typically able to reorient. Based on limited research, plants appear to be less susceptible to effects of RF radiation than animals. Adverse effects were reported at exposures levels of 120 mW/cm^2 and higher (Tanner & Romero-Sierra, 1974). Some researchers have reported other non-thermal biological effects resulting from EMR exposure, such as changes in cellular and reproductive processes. However, the results of such studies remain subject to debate and further study will likely be required to validate the findings and, if applicable, evaluate the potential implications.

Based on the effects of lasers on humans, impacts on wildlife could include eye and skin damage. The potential for adverse effects is affected by intensity of the laser source and distance between source and receptor. Many birds react negatively to laser exposure (e.g., annoyance, startle reactions, avoidance), although sensitivity to various wavelengths and pulse rates vary by species. Lasers with wide, low-power beams are sometimes used to deter or disperse birds in sensitive areas such as airports with no known injury potential. According to an article by the US Department of Agriculture Animal and Plant Health Inspection Service (APHIS), the avian eye filters out some potentially damaging short-wavelength radiation (i.e., harmful radiation from the sun), and birds may therefore be less susceptible than some other animal taxa to eye damage resulting from laser exposure (Lustick, 1973; APHIS Wildlife Services, 2003). However, it is assumed that high-power lasers are capable of harming birds and other wildlife, primarily by eye damage. The results of one study indicate that laser beams can damage the tissue of at least some plants, with the potential for effects increasing with increased laser power and exposure time (Mathiassen et al., 2006).

An EA prepared for EMR use on Eglin AFB (DAF, 2017c) provides a discussion of the operational parameters and physical characteristics of various EMR sources as they relate to potential impacts on biological resources. A summary is provided here. Most radars are elevated well above ground level, in developed compounds where vegetation is largely absent. Most of these compounds are on test areas that consist primarily of regularly maintained grasslands/shrublands, and which therefore provide little to no quality wildlife habitat. Radar antennas are higher than the tree lines of adjacent forested areas. Safety features prevent unintended horizontal and vertical rotation, which prevents radar beams from contacting vegetation, animals on the ground, tree-dwelling animals, and bird nests. RF radiation levels decrease rapidly with distance from the source; therefore, ground- and tree-dwelling wildlife that may occur within the vicinity of the radars are not expected to be exposed to RF radiation levels that can have adverse effects. Birds, including protected bird species, may potentially fly through the path of a radar beam. Due to the volume of space occupied by a radar beam, the probability of a bird flying within a hazard area is considered low. The potential for prolonged exposure of a flying bird is extremely low due to the constant movement of the bird. If a bird flies or hovers directly within the path of a beam, thermal stress would likely trigger the bird to fly in another direction; any associated impact would be short term.

Like radars, most microwave transmitters are elevated well above ground level, are located on or adjacent to test areas, or are located with other structures in developed areas. Most microwave transmitter sites provide little wildlife habitat. Because of the heights and locations of the microwave transmitters, and the fixed direction of the transmitted beams, the beams do not contact vegetation, animals on the ground, tree-dwelling animals, or bird nests. There is minimal dispersion of microwave energy outside the transmitted microwave beam. The antennas also use very low power levels. These operational factors result in very small hazard areas. Therefore, ground- and tree-dwelling wildlife that may occur within the vicinity of microwave transmitters are not likely be exposed to RF radiation levels that can have adverse thermal effects. Birds, including protected species, have the potential to fly within the transmitter hazard areas. As with radars, the potential for prolonged exposure is extremely low due to the movement of the bird. Any exposure would likely be short term.

Operational and safety requirements for laser use on the Eglin Range would minimize the potential for the lasers to impact biological resources. For example, lasers are directed only at designated targets on test areas; they are never intentionally directed toward the ground, sky, forested areas, or water bodies. In addition, the area between the laser and target must be free of tall vegetation and other obstructions to provide the necessary line-of-sight.

A.2.2 Habitat Alteration

Habitat alterations are described as physical damage or disruptions that may adversely alter or degrade terrestrial or aquatic habitats. A habitat refers to the ecologic and geomorphologic components that support organisms, such as vegetation, soil, topography, and water. Degradation of habitats, particularly rare habitats, may impact sensitive species. Examples of habitat alteration include damage or destruction of vegetation; soil erosion; sedimentation of aquatic habitats; wildfires; deposition or dispersal of metals, explosives, and other substances onto the ground, into water resources, or into the air; and habitat fragmentation. Habitat alteration can contribute to displacement, stress, injury, or mortality to the plants and animals that are supported by those habitats.

Ground disturbance associated with testing, training, and maintenance activities may result in damage or mortality to vegetation and may affect soils and topography. Troop movements, vehicle operation, equipment use, bivouacking/camping, and digging (i.e., establishment of fighting positions) have the potential to damage vegetation, including state-listed plants and vegetation located in sensitive habitats. Vegetation loss may result in reduced foraging, sheltering, or nesting resources and may contribute to soil erosion. Activities such as troop movements, vehicle operation (particularly off-road vehicle movement), munitions use (e.g., bombs, missiles, and explosive ordnance disposal [EOD]), and road maintenance may cause soil disturbance or compaction, which can initiate erosion or intensify existing erosion. Stormwater runoff from cleared target areas may also cause erosion; the frequent physical disturbances of target sites by ordnance impacts or explosions create target surfaces that generally lack vegetative cover. Erosion can introduce sediments and any associated contaminants into surface waters, wetlands, and floodplains, and can adversely affect water quality, habitat functions, and hydrologic functions of these water features. Sedimentation can lead to altered stream hydrology and changes to water chemistry. Erosion and sedimentation can also introduce organic matter and nutrients, pesticides, metals, and other materials (e.g., explosives) into receiving systems. In most areas, vegetative groundcover exists between target areas and water features and would diminish runoff and the potential for erosion.

Dispersed, low-density troop movements are not likely to impact sensitive habitats. However, large or heavy troop movements, off-road vehicle movements, bivouacking, or establishment of fighting positions may cause damage. Management actions identified in Section 3.3.2.4 (Biological Resources, Management Actions) would decrease the potential for adverse habitat effects caused by testing, training, and maintenance activities. For example, no ground-disturbing activities would be allowed within 100 feet of any water body or wetland. Large troop movements on steep slopes and in wetlands would be minimized. Wheeled vehicles must remain on existing trails/roads, except those with prior approval. For permitted off-road vehicle use, vehicles must cross streams only at designated crossing points and otherwise must stay a minimum of 100 feet from water bodies and wetlands. Eglin provides restrictions regarding biological resources to mission participants in verbal or written form and on maps showing sensitive habitats and species locations when necessary.

Testing and training activities and, to a lesser degree, maintenance activities may result in deposition or dispersal of potentially harmful materials such as metals, explosives and explosives by-products, propellants, obscurant smoke, petroleum, oil, lubricants, and herbicides onto the ground, into surface waters and wetlands, or into the air. Detonation and expenditure of various munitions and energetics would introduce metals and chemicals onto the ground within the test area boundaries. For example, metals such as lead and copper are present in many munitions, while chemical materials such as 2,4,6-trinitrotoluene (TNT) and its degradation products would be associated with some activities. Metals, explosives compounds, and other substances that are not deposited directly in surface waters, wetlands, or floodplains may potentially be transported to these features by erosion or wind drift. Some of the materials could migrate to groundwater and eventually reemerge in surface waters on or near the Eglin Reservation, potentially including Okaloosa darter streams. The potential for migration of any material to groundwater is influenced by factors such as soil mobility (a measure of the relative ease with which materials move through the soil), volatility (conversion from a solid to a gas), distance to the water table, physical and chemical characteristics of overlying soil or sediments, and degradation processes that occur within the soil, sediments, or water.

The Lakeland soils that occur on much of Eglin AFB are generally conducive to downward migration of materials due to their permeability. However, in general, information provided by the US Environmental Protection Agency (USEPA) indicates that metals in soil tend to either undergo precipitation reactions and form relatively insoluble compounds or strongly bind to soil minerals or organic matter (USEPA, 2023). Both processes result in relatively low bioavailability and toxicity to animals, even when ingested. Exceptions include metals such as arsenic, chromium, selenium, and vanadium, which tend to complex with negatively charged compounds that are comparatively more water-soluble and bioavailable. Explosives such as TNT and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) may be transformed by a variety of physical, chemical, and biological processes. TNT is prone to degradation on the soil surface but a small portion may reach groundwater (USEPA, 2014). Rapid photolysis (breakdown caused by exposure to sunlight) occurs in surface water. RDX does not significantly bind to most soils and may more readily leach to groundwater (USEPA, 2017). Depending on the species and material, wildlife could contact, ingest, inhale, or absorb metal or chemical constituents of expended materials. At high enough concentrations, the materials may adversely affect organisms by interfering with respiration, reproduction, the nervous system, and other physiological functions.

Deposition of some types of materials would be of minimal concern regarding potential impacts to biological resources. Herbicides would be applied in accordance with requirements in Eglin's *Final Environmental Assessment, Long-Term Vegetation Control for Eglin Air Force Base, Florida* (DAF, 2008) and associated Biological Assessment (DAF, 2007), herbicide labels, industry standards, and other DoD and Eglin-specific requirements (Eglin AFB, 2017). All persons mixing or applying herbicides must have appropriate state licenses. Substances used to initiate prescribed fires would be applied in accordance with established practices and would not cause significant impacts on biological resources. The types of expendables that would be of most concern would be those associated with deposition of metals, explosives, smokes, and other obscurants.

A detailed analysis of the quantities of various expendables constituents released into the ROI (e.g., lead compounds, phosphorus compounds, TNT and its products), the environmental fate and transport of these materials, and potential effects on various terrestrial and aquatic biological taxa across a range of concentrations and exposure scenarios, is beyond the scope of this EA. However, evaluation of the overall effects likely associated with constituents of concern are provided in the analyses of activities at representative test areas. Activities at the TA C-52 Complex (located on the eastern side of the Eglin Reservation) and at TA B-75 produce large quantities of ordnance, ammunition, explosives, or other expendables relative to activities at some other areas on the Eglin Reservation. Although the TA C-52 Complex is not part of this EA, it is included here because of the detailed analysis of expendables available and the applicability to Eglin ranges in general. Soils and environmental conditions on the TA C-52 Complex and TA B-75 are similar to those occurring on most of the Eglin Reservation. Therefore, analyses of activities at these test areas are considered to adequately represent potential effects in the ROI in general.

Test Area C-52 Complex

Evaluation of activities at the TA C-52 Complex is provided in the *Test Area C-52 Complex Environmental Baseline Document* (DAF, 2005) and *Test Area C-52 Complex Range Environmental Assessment* (DAF, 2014). The TA C-52 Complex supports relatively high expenditure levels of ordnance, ammunition, explosives, and smoke.

The TA C-52 Complex EBD analyzed metal and chemical constituents of munitions that are deposited on the soil, and which may potentially be transported to streams, floodplains, wetlands, or groundwater. The cumulative amounts of constituents from live bombs, missiles, gunnery ammunition, small arms ammunition, chaff, and flares on TAs C-52C, C-52N, and C-52W resulting from a 10-year period of use were modeled. The predicted concentrations of munitions constituents in soil were then compared to USEPA human-health risk (soil-industrial) regional screening levels (RSLs), USEPA ecological soil screening levels (SSLs), and estimated background soil concentrations. RSL values indicate potential risk to human health from exposure to levels above criteria. SSLs are concentrations of contaminants in soil that are protective of ecological receptors (low probability of unacceptable risk) that commonly contact soil or ingest biota that live in or on soil. SSL values can be used as a first level screening criteria to identify contaminants of potential concern that may warrant further analysis. Predicted concentrations of munitions constituents in the soils of TAs C-52C, C-52N, and C-52W are shown in Table A-2. In the table, SSL levels are shown for all receptors combined, although individual levels are available for specific receptors (e.g., birds, mammals, and plants) and are generally higher than the composite level. The predicted concentrations of all munitions constituents in soil on the evaluated test areas were below human-health risk and ecological screening criteria, although the predicted copper concentration at C-52N was near the ecological screening level. All predicted constituent concentrations were below the estimated background concentrations, except copper at TA C-52N.

Table A-2. Predicted Concentrations of Munitions Constituents in Soil on the Test Area C-52 Complex Resulting from 10 Years of Accumulation

Munitions Constituent	Soil Background[1] (mg/kg)	Human Health RSL[2] (mg/kg)	Ecological SSL[3] (mg/kg)	C-52C (mg/kg)	C-52N (mg/kg)	C-52W (mg/kg)	Maximum Soil Migration Depth (meters)
Aluminum	7,500	110,000	50	0.1647	19	0.1098	0.1
Barium	22	22,000	330	0.0722	0.0467	<0.0001	3.1
Cadmium	0.91	10	0.36	0.0150	0.2758	<0.0001	1.9
Copper	14	4,700	28	0.0227	27	0.6816	3.6
Lead	54	800	11	0.0001	1	0.0137	0.2
RDX	No Data	440	2.3	<0.0001	<0.0001	<0.0001	No Data[4]
TNT	No Data	51	7.5	<0.0001	0.0137	<0.0001	14.3
Zinc	45	35,000	46	0.0123	11	0.2830	0.2

< = less than; mg/kg = milligrams per kilogram; RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine; RSL = regional screening level; SSL = soil screening level; TNT = 2,4,6-trinitrotoluene; US = United States

Notes:

1. Values provided in the 2005 C-52 Environmental Baseline Document (DAF, 2005).
2. US Environmental Protection Agency Regional Screening Levels (Composite Worker Soil, Target Hazard Quotient 0.1) (USEPA, 2024).
3. US Environmental Protection Agency Ecological Soil Screening Benchmarks (ORNL, 2024).
4. Based on information provided by the US Environmental Protection Agency (USEPA, 2017), RDX is more likely to migrate through the soil than TNT.

Based on the predicted concentrations, accumulation of the identified munitions constituents in soil on the TA C-52 Complex probably has little overall potential to degrade soil quality to a level that would adversely impact ecological receptors. However, the concentrations of metals in soil near individual targets may be substantially greater than the overall concentration predicted for a given test area. For example, Table A-3 shows that concentrations of copper, lead, and zinc found near some heavily used targets exceeded the ecological SSL (particularly Test Target [TT]-9). Therefore, the combination of all available information suggests that metal concentrations of ecological concern may be present in soil near some targets but would not be expected on most portions of the test areas that contain targets, on test areas without targets, or on areas adjacent to the test areas. Information on possible variability in soil concentrations of explosives relative to distance from targets or other locations of frequent use was not available.

Table A-3. Predicted and Measured Metal Concentrations at Test Area C-52N

Munitions Constituent	Soil Background[1] (mg/kg)	Ecological SSL[2] (mg/kg)	1999 Average Measured Soil Concentrations (mg/kg) at Select C-52N Targets[1]		
			TT-4	TT-9	TT-12
Copper	14	28	25	330	29
Lead	54	11	192	160	44
Zinc	45	46	20	198	29

mg/kg = milligrams per kilogram; SSL = soil screening level; TT = Test Target; US = United States
Notes:
1. Values provided in the 2005 C-52 Environmental Baseline Document (DAF, 2005).
2. US Environmental Protection Agency Ecological Soil Screening Benchmarks (ORNL, 2024).

Because munitions are not purposely used in surface waters, wetlands, or floodplains, the primary means by which metals and explosives could reach these features would be stormwater runoff and erosion. Constituents could also potentially migrate to groundwater, flow laterally, and emerge in surface waters or wetlands. Overall, such impacts would likely be minor based in part on the low modeled soil concentrations, although the potential would be greater near targets or other areas of relatively greater munitions use. Vegetative groundcover would also slow runoff and reduce the potential for erosional transport. Metals such as lead and copper tend to form insoluble compounds or bind with minerals and organic matter, and therefore a large portion of these constituents, if transported to streams, would likely settle out of the water column. Other metals such as chromium are more water-soluble and would likely remain in the water column for a longer time. Modeling results indicated that metals would generally remain in the upper surface layer of soil (0.1 to 4 inches) (DAF, 2005), and therefore, significant migration to groundwater would not be expected. Explosives such as TNT and RDX have greater potential to migrate through the soil, but the overall low predicted soil concentrations suggests that significant impacts to groundwater would be unlikely. Past groundwater sampling on TA C-52N indicated that concentrations of explosives constituents did not exceed regulatory criteria (DAF, 2014).

Although flares were included in modeling for the TA C-52 Complex, soil concentrations of magnesium, which is the primary combustion product of flares, were not estimated. However, magnesium deposition on soil was analyzed separately based on the maximum annual expenditure of flares, which was assumed to be 44,560 flares per year (DAF, 2014). Expenditure of this number of flares over TA C-52N and TA C-52C was estimated to result in approximately 0.11 pound of magnesium residue per acre. As a comparison, agricultural applications of magnesium as a soil nutrient can be 10 pounds per acre or more. Total annual flare use at the TA C-52 Complex is substantially less and would therefore result in much lower magnesium deposition on soils relative to that estimated in 2005.

Smokes (which include phosphorus smokes, metal-based obscurants, and fog oil) and metal-based obscurants have historically been used on TA C-52A and TA C-52C. Discussion of the potential impacts associated with these expendables is also provided in the 2014 *TA C-52 Complex Range Environmental Assessment* (DAF, 2014), which relies on analysis from the previous 1999 TA C-52 Complex Programmatic EA. Phosphorus smokes may include red phosphorus, white phosphorus, and plasticized red or white phosphorus. Constituents of concern include forms of elemental phosphorus and phosphoric acid. Wildlife could be exposed to dye-colored smoke through inhalation, ingestion, direct contact, or bioaccumulation. The potential for adverse effects would be influenced in part by the specific type of smoke used. For example, only mild toxicity appears to be associated with red phosphorus, while lethality, severe respiratory effects, and other adverse health effects have been documented in laboratory animals exposed to relatively high concentrations of white phosphorus smoke (NRC, 1997; NRC, 1999). Blue dye has been associated with aquatic toxicity (DAF, 2005). In general, the major mechanisms of exposure to dye colored smoke are inhalation and dermal contact. Once deposited on the ground, acids in the phosphorus aerosol break down and have low potential for adverse effects.

Exposure to harmful smoke concentrations would be most likely within a short distance of the release point, immediately after the smoke has been expelled. An investigation of the ecological toxicity of smokes and obscurants found that smoke particle deposition was greatest within 5 meters of the release point and decreased rapidly to nondetectable levels beyond 25 meters (Cropek et al., 2008). Toxicity in aquatic organisms was limited to short distances (approximately 1 meter) from the release point. Based on available information, wildlife located near a smoke release point could experience severe irritation or injury due to inhalation or dermal contact. Mobile species would probably leave the training area before exposure due to general human disturbance. Any individuals remaining in the area would likely flee at the onset of exposure. Adverse impacts would be more likely for species or life stages with limited mobility. The potential for impacts would decrease with increasing distance from the release point because of the dilution of smoke particles. Potential impacts to individual animals flushing or fleeing an area include energy expenditure, decreased foraging time, increased exposure to predation, and abandonment of eggs or young. Due to the limited duration of any given training event involving smoke, such impacts would typically be temporary. Because of the potential to affect aquatic habitats, Eglin restricts the use of smokes within 100 feet of water bodies and directs that they never be thrown directly into a water body. To protect water quality, Eglin restricts the release of toxic aerosols within 300 feet of streams (Section 3.3.2.4, Biological Resources, Management Actions).

Metal materials used as obscurants on the TA C-52 Complex have historically included aluminum, aluminum-coated glass, brass flake, and nickel-coated carbon. The 2014 *TA C-52 Complex Range Environmental Assessment* (DAF, 2014) discussed the potential impacts of deposition of these materials based on activity levels in 1999, which were substantially greater than current levels of smoke use. The results of soil sampling and estimates of metal concentrations following training events in 1999 suggested that expenditure of metal obscurants would have no significant effect on soils, and therefore little potential to affect wildlife. Other materials historically used as obscurants include graphite, carbon fiber, silica, and kaolin. These materials are chemically inert, and analysis conducted in 1999 determined that their use would not result in a significant effect on soils. Therefore, it is unlikely that they would significantly affect wildlife.

Fog oil is a type of obscurant emitted from smoke generators. When heated, fog oil is vaporized and emitted as a smoke cloud. Once dispersed, fog oil aerosols cool rapidly and settle onto the ground surface. Therefore, impacts to terrestrial species could potentially occur via inhalation, direct exposure to skin, and ingestion. Fog oil that is deposited on soil surfaces is relatively short-lived. Much of the fog oil soon evaporates (up to 90 percent within 1 week) and is broken down by oxidation, photolysis, and microbial degradation. Soil sampling during previous periods of heavy fog oil use on Eglin AFB indicated there was no increase in hydrocarbon concentrations in surrounding soils (DAF, 2005). Deposition onto aquatic habitats is of greater concern. In one investigation, acute toxicity was found in *Daphnia magna* (a small aquatic crustacean) at 5 meters from a fog oil generator, and individuals were observed to be stuck in a surface film up to 50 meters downwind (Cropek et al., 2008). Effects to midge fly larvae were found at relatively high surface concentrations. Physical contact with oils on the water surface seems to be a major factor in toxicity. Acute toxicity or other effects were not found in algae, submerged vegetation, fish, or amphibians. Fog oil droplets did not disperse farther than 50 meters from the generation point; therefore, there were no impacts beyond this distance. During a laboratory portion of the study, elevated mortality was found in fountain darter (*Etheostoma fonticola*) larvae subjected to seven consecutive days of fog oil exposure. However, such an exposure scenario is unlikely during training on Eglin AFB. Based on available information, fog oil would likely have minor impacts on terrestrial wildlife and most aquatic wildlife but could cause mortality or other physical effects on some fish larvae and aquatic invertebrates located near the surface. Impacts on invertebrates could affect animals that feed on them (e.g., birds, bats, and fish) by reducing prey availability, depending on the species and life stages affected. Impacts would be limited to relatively small areas around a generator (radius of approximately 50 meters, or 164 feet). Eglin restricts the use of smokes within 100 feet of water bodies and the release of toxic aerosols within 300 feet of streams (Section 3.3.2.4, Biological Resources, Management Actions).

Test Area B-75

The TA B-75 Range EA (DAF, 2010), which summarized munitions residue analysis provided in the 2000 programmatic B-75 EA, identified small arms training as the activity associated with the greatest deposition of materials such as metals onto the soil. The results of soil testing at selected target berms showed that concentrations of copper, iron, zinc, aluminum, chromium, and lead were below average Eglin background levels and USEPA human-health risk concentrations where such data is available (Table A-4). Note that Eglin background soil levels provided for TA B-75 differ somewhat from those provided in the TA C-52 Complex EBD (DAF, 2005); the reason for the difference was not addressed in the TA B-75 Range EA. Aluminum concentration was above the ecological screening concentration, but the concentrations of all other metals was below ecological screening levels. Analysis in the 2013 *Air and Ground Gunnery: Test Areas A-73, A-77, A-78, A-79, B-7, and B-75 Final Range Environmental Assessment* (DAF, 2013) identified a potential increase in small arms fire at TA B-75 of about five times the quantity analyzed in 2000. Under this scenario, metal concentrations in soils at test area berms could increase, although the magnitude of the increase is unknown.

Table A-4. Metal Concentrations in Soil at Test Area B-75 Target Berms (2000)

Soil Stratum	Munitions Constituent Soil Concentration (mg/kg)					
	Copper	Iron	Zinc	Aluminum	Chromium	Lead
Target Berm B-2						
Surface	0.30	9.78	0.34	45.18	0.00	0.11
Subsurface	0.07	13.28	0.48	91.43	0.05	0.11
Target Berm B-3						
Surface	0.49	18.39	0.22	124.02	0.07	1.00
Subsurface	0.00	19.71	0.23	101.13	0.08	0.45
Target Berm B-5						
Surface	3.20	15.04	1.11	76.55	0.10	9.90
Subsurface	0.70	19.71	0.56	92.55	0.00	2.92
Eglin Background Soil Concentration[1] (mg/kg)						
Surface Range (Average)	0.15-90 (4.42)	51-10,700 (2,001)	0.79-376 (17.71)	63-26,500 (2,889)	0.35-25.9 (3.58)	0.78-340 (19.82)

Table A-4. Metal Concentrations in Soil at Test Area B-75 Target Berms (2000)

Soil Stratum	Munitions Constituent Soil Concentration (mg/kg)					
	Copper	Iron	Zinc	Aluminum	Chromium	Lead
Subsurface Range (Average)	0.22-100 (2.68)	31-10,000 (1,472)	0.63-62 (4.17)	25-15,000 (2,378)	0.53-27 (2.22)	0.49-1,100 (23.44)
Human Health RSL[2] (mg/kg)						
	4,700	82,000	35,000	110,000	180,000	800
Ecological SSL[3] (mg/kg)						
	28	No Data	46	50	26	11

mg/kg = milligrams per kilogram; RSL = regional screening level; SSL = soil screening level; US = United States
Notes:
1. Values provided in the 2010 B-75 Range Environmental Assessment (DAF, 2010).
2. US Environmental Protection Agency Regional Screening Levels (Composite Worker Soil, Target Hazard Quotient 0.1) (USEPA, 2024).
3. US Environmental Protection Agency Ecological Soil Screening Benchmarks (ORNL, 2024).

Analysis in the B-75 Range EA, based on the 2000 Programmatic EA, indicates that the high level of small arms use and relatively low concentrations of lead and copper in soil samples at target berms suggests that either the metals may become soluble in soil and migrate downward, or they may remain in target berms as intact slugs for an extended time. Lead and copper that degrades and becomes soluble could leach into the surficial aquifer and flow with groundwater to nearby surface waters. Soil conditions at the target berms are favorable for a high degradation rate and associated infiltration to groundwater. However, the Eglin Environmental Restoration Program found that lead generally exhibits limited vertical migration on the installation, and it was therefore theorized that lead degrades slowly on Eglin AFB and does not substantially manifest in the soil or groundwater (DAF, 2013).

In addition to small arms training, analysis of ground test bomb detonations and EOD operations for residual metal constituents was summarized in the B-75 Range EA (DAF, 2010). The types of ordnance expended during EOD operations included live and inert bombs, C-4 explosive, demolition charges, breaching charges, detonation cord, mines, fuzes, igniters, and ground burst simulators. Aluminum, barium, and copper were found to be the primary constituents of concern. Estimated cumulative concentrations over a three-year period (1995 to 1997) at Training Target 18 on TA B-75 were well below typical background concentrations on Eglin AFB, human-health risk levels, and ecological screening levels (Table A-5). There is currently no groundwater sampling for metal or explosives constituents on TA B-75 or any of the other A or B Ranges.

Table A-5. Estimated Concentration of By-products on TA B-75, Training Target 18 (1995–1997)

Metal	Total Soil Surface Deposition[1] (pounds)	Estimated Soil Concentration[1] (mg/kg)	Human Health RSL[2] (mg/kg)	Ecological SSL[3] (mg/kg)
Aluminum	182	2.7	110,000	50
Barium	5	0.1	22,000	330
Copper	37	0.6	4,700	28

mg/kg = milligrams per kilogram; RSL = regional screening level; SSL = soil screening level; TA = Test Area; US = United States
Notes:
1. Values provided in the 2010 Test Area B-75 Range Environmental Assessment (DAF, 2010).
2, US Environmental Protection Agency Regional Screening Levels (Composite Worker Soil, Target Hazard Quotient 0.1) (USEPA, 2024).
3. US Environmental Protection Agency Ecological Soil Screening Benchmarks (ORNL, 2024).

The information summarized above for the TA C-52 Complex and TA B-75 suggests that, overall, deposition of metals, explosives, and other materials on test areas would probably not degrade soil quality to a level that would adversely impact ecological receptors. Exceptions occur at some heavily used targets, but adverse effects are likely limited to small areas around the targets. Metals and explosives may migrate through the soil and reach groundwater, where they could potentially flow to surface waters. These materials do not seem to occur in groundwater at high concentrations. Information on groundwater sampling for most test areas is unavailable, but sampling results at TA C-52N showed that concentrations of explosives constituents did not exceed regulatory criteria.

Although prescribed burning helps to maintain healthy habitats and wildlife populations (including populations of ESA-listed species), habitats in the ROI may be negatively altered by wildfires, which are potentially uncontrolled, destructive fires that sometimes spread quickly. Wildfires can be started by using certain types of munitions and pyrotechnics, or by other means such as improper control of campfires and vehicle ignition/idling on dry vegetation. As discussed in Section A.2.1 (Direct Strike), Eglin uses prescribed fire in part to decrease the occurrence of wildfires. However, there is potential for prescribed fires to adversely impact habitats as well. The primary considerations regarding fires are natural fuel buildup, frequency of fires, and the tolerance of vegetation to fire events. Fire is generally beneficial to habitats such as sandhills, wetlands, and flatwoods, including the wildlife species these habitats support. Typically, some vegetation may be top-killed, but most plant species resprout vigorously within a few weeks. In some cases, test area fires that start in open grassland-shrubland areas burn out quickly, affecting relatively small areas. However, wildfires can damage sensitive habitats (e.g., wetlands, High Quality Natural Communities, Outstanding Natural Areas) if they burn too hot, smolder, or require fire suppression activities. Wildfires can also cause extensive damage to longleaf pine communities and other habitats under conditions of high fuel and dry weather. Fire-related impacts to vegetation may represent damage to or reduction of available wildlife habitat, which may result in effects such as missed foraging and mating opportunities, loss of nesting sites, increased vulnerability to predators, and prey reduction.

To minimize the potential for impacts from wildfires, Eglin has implemented a wildfire management program that includes all aspects of fire prevention, detection, suppression, readiness, fire line rehabilitation, and training. Some fire-suppression activities, such as the use of heavy machinery for fire response, could result in changes to the landscape, localized alterations to hydrology, sedimentation, and direct damage to sensitive vegetation; however, such activities would be avoided in sensitive habitats to the greatest extent possible. Due to the presence of unexploded ordnance, portions of some test areas are designated as "no-suppression" or "restricted-suppression" areas and have associated restrictions on firefighting. Block-and-burn techniques, such as setting counter fires on surrounding roads, are typically used by the Air Force Wildland Fire Center at Eglin AFB to control the spread of wildfires that may start in these areas. Specific protection measures are implemented during wildfire suppression in areas that are classified as biologically sensitive. For example, plows are not used off range roads for fire suppression, except in extreme conditions and with the approval of the Wildland Fire Program Manager or their designee, in or near streams, riparian buffers, wetlands, high-quality natural areas, or ESA-listed species habitats. These restrictions minimize the potential for impacts to protected species such as the Okaloosa darter. Prescribed burning is prioritized and conducted on species-specific rotations in areas known to contain other protected species such as the RCW.

Missions are required to be planned and conducted in accordance with fire danger ratings. In general, activities with relatively high potential to result in fires are restricted on days when environmental conditions are most conducive to fire. Range users must check the fire rating danger daily and follow restrictions guidance accordingly. Range users must immediately notify the Joint Test and Training Operations Control Center and Eglin Fire Dispatch of any wildfire observed. Additional measures that are required to be implemented by range users to avoid and minimize potential wildfire starts are identified in Section 3.3.2.4 (Biological Resources, Management Actions).

Potential habitat impacts may be evaluated in the context of protected species. Destructive wildland fires can result in the loss of RCW nesting sites and damage to quality foraging habitat. Although an artificial cavity insert would be installed to replace any burned cavity tree, there would be a temporary disturbance to the birds and a possible reduction in breeding and foraging opportunities. There could be a decrease in overall nesting success if birds did not renest. However, frequent fire is required to maintain quality RCW habitat, and prescribed fire is used to manage RCW longleaf pine foraging and nesting habitats on Eglin AFB. Cavity tree preparation, which involves removal of fuels from around the base of trees, is typically conducted before prescribed fires are ignited. Even wildfires may be beneficial. The predominance of open grassland and shrubland habitat on many test areas reduces the potential for catastrophic fire effects. Thus, although individual fires may result in adverse effects to the RCW, fires overall are likely to provide a long-term net benefit to populations. The RCW Programmatic Biological Opinion addressed potential impacts resulting from all management actions and military missions at Eglin AFB, including the potential for wildfire (USFWS, 2013). All applicable requirements contained in the Biological Opinion would be adhered to during testing and training.

Wildfires in some wetland and riparian areas could affect the Okaloosa darter. Generally, in riparian areas, fire burns back the aboveground biomass leaving the root systems alive and intact. Most plant species resprout and create new aboveground growth. Openings in the canopy resulting from the fire also create an opportunity for other plant species to become established. These factors generally decrease the potential for impacts to the Okaloosa darter. Fire suppression activities are limited near streams (including Okaloosa darter streams), riparian buffers, and wetlands.

Gopher tortoises frequently occupy fire-dependent communities, and therefore, fire generally has a beneficial effect on this species' habitat. Periodic fire keeps the sandy soils open for burrowing and maintains the early successional vegetation stages that tortoises require. Preferred tortoise foods such as the partridge pea (*Chamaecrista fasciculata*) increase in response to fires. Prescribed fires and wildfires would reduce the amount of vegetation available for eastern indigo snake refugia for up to a few weeks, but regrowth would quickly fill in the area, and prey species abundance would increase in the regrowing vegetation.

A.2.3 Noise and Other Disturbance

Wildlife may be impacted by noise and general disturbance resulting from testing, training, and maintenance activities. Visual or auditory detection of human presence and general activity may startle or disturb wildlife, potentially resulting in stress or behavioral reactions such as avoiding or fleeing an affected area. Individuals could retreat to shelter (e.g., burrows or tree cavities) or temporarily leave an area of high activity level to forage or rest in similar habitats in nearby areas. These reactions could interrupt other activities (feeding, resting, etc.) and would require energy expenditure. Temporarily abandoned eggs or young would be more vulnerable to predators; however, predators may also avoid the area because of the disturbance. Although an avoidance response would cause a behavioral change and reduce the amount of energy available for other biological functions, these events would usually be infrequent and brief, and the energy expense would likely be within the normal range experienced by most animals over a short time. Some animals occurring on or near the test areas are likely habituated to human presence to some degree. Human presence and activity above typical background levels would generally last for only a few hours in any location. Once the activities are completed, affected animals could return to the area. Most mission and maintenance activities would occur within cleared areas and on roads, which are poor habitat for most species. Additionally, many of these areas are currently disturbed as part of regular training and maintenance activities.

In addition to effects due to human presence and general disturbance, wildlife may be impacted by noise resulting from use of items such as small arms blanks and live rounds, air-to-surface gunnery rounds, and C-4 explosive, as well as detonation of energetics in various other expendables such as bombs and pyrotechnics. Potential stress and behavioral reactions would be similar to those described above for general disturbance but could be more pronounced due to the loudness and impulsive nature of the noise. In addition, detonation noise may potentially cause temporary or permanent hearing impairment.

In general, a sudden or unfamiliar sound may cause an alarm reaction in most species, triggering short-term physiological reactions (fight-or-flight response). Behavioral reactions may include responses ranging from simply looking toward the sound to fleeing or stampeding. These reactions cause energy reserves to be used, may interrupt important behaviors, and may result in injury (trampling, etc.). Avoidance behaviors may also expose the affected animal, its young, or its eggs to predators or environmental stress (e.g., cooling of unattended eggs). Conversely, wildlife may become habituated to repeated noise and show no observable response over time. In addition to behavioral reactions, impulsive noise may result in physiological effects including permanent or temporary hearing threshold shifts (an increase in the loudness, or decibel (dB) level, necessary for an animal to hear sound at a particular frequency) and ear damage. Noise of sufficient volume and duration can mask other relevant sounds.

The likelihood of individual and population-level impacts due to noise is often difficult to evaluate and may vary between species, among individuals of the same species, or even within the same animal at different times or under varying circumstances. Information on specific noise levels associated with physiological or behavioral effects is generally limited. In the absence of such information, Eglin has used human noise impact levels in previous analyses as a proxy for levels potentially affecting sensitive species. A noise level of 140 dB at peak pressure is considered the threshold at which damage to human hearing can occur and has been used as the level above which physical injury may potentially occur in wildlife as well. In general, Eglin allows a maximum 140-dB noise level to leave the reservation (DAF, 2015).

One study investigated the effects of military training noise on RCWs at Fort Stewart, Georgia (US Army installation) (Delaney et al., 2002). Researchers conducted video camera monitoring of RCW responses to various training events over a period of two years, which included nesting seasons. Training events included noise-producing activities such as small arms live fire, large-caliber live fire, artillery/grenade simulator blasts, helicopter use, and vehicle operation. Most activities were conducted multiple times at various distances from RCW cavity trees. Response summaries for relevant activities are provided below.

Artillery Simulator

During simulator events, RCWs did not flush from nests when noise levels were below 65 dB weighted (dBW) for best woodpecker hearing sensitivity (72 dB unweighted). Blasts producing this noise level were located about 152 meters from the cavity tree. Increasing numbers of birds flushed with increasing noise levels and proximity to the noise source. Flush frequency increased to 50 percent at a noise level of about 82 dBW (the unweighted level was not provided but is assumed to be over 90 dB based on other information in the study report). Birds that flushed returned to their nests within 4.4 minutes on average, and no later than 16.2 minutes overall.

.50-Caliber Blank Fire

RCWs did not flush from the nest when firing events were more than 152 meters away and received noise levels were below 68 dBW. At distances of less than 122 meters, approximately half the birds flushed. Noise levels ranged from 42 dBW at 244 meters to 92 dBW at 15 meters from RCW nest trees. Birds returned to nests within 6.3 minutes after being flushed on average, and no later than 26.8 minutes overall.

Small-Caliber Live Fire

RCWs did not flush when small arms live-fire events were more than 400 meters from nests and noise levels were below 51 dBW (76 dB unweighted). Fifty percent of birds flushed at noise levels of about 80 dBW, which corresponded to a distance of about 75 meters. Absence duration was not stated. The researchers anecdotally noted that on some days, RCWs appeared to arrive at and depart nests only during inactive firing periods.

Large-Caliber Live Fire

RCWs did not flush when large caliber guns were fired at distances of more than 700 meters from nests, with corresponding noise levels below 59 dBW (102 dB unweighted). Birds flushed in response to large caliber blasts between 500 and 600 meters from nests. During a series of 13 blasts of 155-mm rounds, an adult flushed in response to the loudest event (77 dBW, 108 dB unweighted), returned to the nest after 6.25 minutes, and did not flush in response to a subsequent blast of approximately equal noise level. During another event that involved 60 blasts, an adult flushed after the 52nd blast (79 dBW, 105 dB unweighted) and returned 4.4 minutes later.

Vehicle Operation

Only two flush events in response to vehicles were recorded during the study. One adult flushed when a convoy of 17 Bradley Fighting Vehicles passed within 30 meters of the nest tree. The individual returned after the convoy had passed (about 10 minutes). Another individual flushed when a single civilian vehicle passed within 15 meters and returned within 3 minutes.

The researchers reported a small, statistically nonsignificant reduction in nesting success in RCWs exposed to training noise relative to control groups. Reproductive success for disturbed and control groups were reportedly comparable with population level success rates on Fort Stewart overall. Researchers suggest that the small difference was attributable to natural attrition inherent in the larger noise-exposed sample. It was also suggested that some flushing behavior might have been the result of visual perception of training activities rather than specific noise levels.

Little information is available on the reaction of gopher tortoises to noise. One study involved the effects of simulated aircraft noise and sonic booms on the desert tortoise (*Gopherus agassizii*), which is a species within the same genus of the gopher tortoise (Bowles et al., 1999). Although aircraft noise is not evaluated in this EA, the study results are potentially relevant regarding general tortoise response to noise. The most common behavioral response to subsonic noise was freezing, with slow changes in activity beginning about 10 minutes after the freeze response. Other reactions included abruptly turning the head, head retraction, increased walking, and attempts to climb the enclosure barricade. Long periods of freezing (greater than 15 minutes) generally occurred only during the first series of exposures, and the tortoises seemed to habituate thereafter. When exposed to simulated sonic booms, behavioral reactions were limited compared to those associated with subsonic noise and were often difficult to distinguish from normal activities. The most substantial reaction was to look for the noise source. About half the individuals exposed to 10 sonic booms exhibited a small (5 to 20 dB) hearing threshold shift. Recovery in all but one individual occurred within one hour; the remaining individual (which experienced the 20-dB shift) had recovered when it was examined two days later. Permanent threshold shifts were not found. Overall, the desert tortoise study authors concluded that exposure to aircraft noise would not likely cause significant alteration of daily activity budgets or cause tortoises to expose themselves to unfavorable conditions (e.g., emerging from burrows during high temperatures or in the presence of predators).

Other reptiles, such as the eastern indigo snake and Florida pine snake, generally do not exhibit a pronounced observable acoustic startle response and, overall, are not considered susceptible to significant noise impacts. Snakes would generally detect only the low-frequency component of noise. Burrows may provide some level of noise protection, although in some cases noise levels may be amplified within a burrow.

A.2.4 Invasive Species

Invasive plant species may compete with and possibly displace native species. They may also degrade protected species habitat and alter natural processes such as fire or wetland hydrology. Invasive species may colonize recently disturbed areas, and therefore, ground movements and other ground-disturbing activities may allow such species to spread. Wildfire may also create conditions favorable to invasive species, which may colonize burned areas and become established before native vegetation. Conversely, invasive species that are not fire-tolerant may be killed in wildfires, thereby benefitting the health of native ecosystems. Prescribed fires generally help to control invasive plants. Seeds and rhizomes of invasive species may be inadvertently transported to new areas by vehicles, bush hogging equipment, or other equipment and may be present in fill and landscaping materials. To reduce the potential for spreading invasive species, military vehicles and equipment would be cleaned before and after use in accordance with Armed Forces Pest Management Board Technical Guide Number 31, *Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment* (Armed Forces Pest Management Board, 2021).

Noise and visual disturbance associated with natural resources activities, such as invasive plant species control, typically would last for only a few hours in any one location. These activities would likely cause wildlife to leave that immediate area to forage and rest in surrounding areas temporarily, which would minimize the potential for direct impacts. Use of herbicides for invasive species control would reduce vegetation temporarily, but in most cases, the regrowth would be composed of beneficial native species. Displaced wildlife would likely use other nearby areas temporarily until the habitats recovered from treatments.

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APPENDIX B
AIR QUALITY SUPPORTING DOCUMENTATION

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AIR QUALITY SUPPORTING DOCUMENTATION

B.1 Munitions Emissions Calculations

Emissions factors for representative surrogate munitions were obtained from the United States Environmental Protection Agency's (USEPA's) AP-42 compilations of emissions factors from various sources. Emissions factors are provided in Table B-1.

Available USEPA emissions factors (AP-42, *Compilation of Air Pollutant Emissions Factors from Stationary Sources*) were utilized. These factors were then multiplied by the net weight of the explosive (or a conversion factor for pounds per item) and the number of times that munitions were used during a designated time frame. This calculation provided annual pounds per year of emissions, which were converted to tons per year for comparison purposes.

Emissions = EXP/YR×EF

Where:

Emissions = Ordnance Emissions (pounds per year)

EXP/YR = Explosives, propellants, and pyrotechnics used per year

EF = Emissions factor

Table B-2 provides the detailed results of the calculated annual air emissions for each type of munition. Note that to provide a conservative estimate, inert bombs and other munitions were assumed to be live, so the totals represent all the live and inert munitions presented in Table 2-2 (Maximum Annual Expenditures for TAs A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82) and Table B-2, respectively.

Table B-1. US Representative Munitions Emissions Factors

DODIC/NSN	Description	Quantity (EXP/YR)	Emissions Factors (EF)							
			CO	NOx	PM_{10}	$PM_{2.5}$	SO_x	VOCs	CO_2	CH_4
MK82	Bomb	220	3.98E-03	1.54E-04	3.69E-01	3.69E-01	1.58E-04	2.63E-04	5.25E-01	
A111 or A136	Small Cartridge (7.62 mm)	4122066	6.80E-04	4.40E-05	1.70E-05	1.50E-05	3.50E-07		9.50E-04	2.90E-06
B519	Medium Cartridge (40 mm)	176064	3.50E-04	3.60E-05	2.60E-05	2.30E-05			2.60E-04	3.70E-06
M023, M112	C-4 Explosive	4838	2.60E-02	7.90E-03	2.60E-02	1.90E-02	1.50E-04		7.90E-01	1.60E-03
H459	Rocket Motor	1716	1.50E+00	2.60E-02	1.10E-01	1.00E-01			2.40E+00	1.50E+00
K145, M18A1	Mine (e.g., Claymore)	189	2.00E-02	1.80E-02	4.90E-02	2.60E-02	9.10E-05		2.00E-02	3.80E-04
G881, M67	Grenade	2335	1.70E-02	1.10E-03	3.10E-02	1.70E-02			1.70E-02	2.80E-04
L305, M195	Flare/Smoke	628	9.40E-03	2.40E-03	1.20E-01	1.20E-01	7.80E-05	1.70E-04	8.80E-02	
D540, M3A1	Propelling Charge	3935	5.90E-01	3.90E-02	1.70E-02	8.10E-03			2.10E-01	3.30E-03
M448, M2A1	Detonator	1686	3.50E-04	1.60E-04	7.70E-04	4.80E-04			1.40E-03	3.50E-06
C445	Large Cartridge	22900	2.50E-01	3.60E-02	2.70E-01	1.10E-01			3.30E+00	4.80E-03
L366	Explosive Simulator	10299	5.20E-03	8.60E-04	5.80E-03	4.00E-03	4.30E-05		1.70E-02	

CH_4 = methane; CO = carbon monoxide; CO_2 = carbon dioxide; DODIC = Department of Defense Identification Code; EF = Emissions Factor; EXP – expenditures; mm = millimeter; NOx = nitrogen oxides; NSN = National Stock Number; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; SO_x = sulfur oxides; TP-T = target practice and training; US = United States; VOC = volatile organic compound; YR = year

Table B-2. Annual Munitions Emissions

DODIC/NSN	Description	Quantity (EXP/YR)	Annual Emissions (tons/yr)							
			CO	NOx	PM_{10}	$PM_{2.5}$	SO_x	VOCs	CO_2	CH_4
MK82	Bomb	220	0.00	0.00	0.04	0.04	0.00	0.00	0.06	0.00
A111 or A136	Small Cartridge	4,122,066	1.40	0.09	0.04	0.03	0.00	0.00	1.96	0.01
B519	Medium Cartridge	176,064	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.00
K145, M18A1	Mines	189	0.00	0.00	0.00	4.91	0.00	0.00	0.00	0.00
G881, M67	Grenades	2,335	0.02	0.00	0.04	0.02	0.00	0.00	0.02	0.00
M023, M112	C-4	4,838	0.06	0.02	0.06	0.05	0.00	0.00	1.91	0.00
H459	Rocket/rocket motors	1,716	1.29	0.02	0.09	0.09	0.00	0.00	2.06	1.29
L305, M195	Flare/Smoke	628	0.00	0.00	0.04	0.04	0.00	0.00	0.03	0.00
D540, M3, M3A1	Propelling Charge	3,935	1.16	0.08	0.03	0.02	0.00	0.00	0.41	0.01
M448, M2A1	Detonator	1,686	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C445	Large Cartridge	22,900	2.86	0.41	3.09	1.26	0.00	0.00	37.79	0.05
L366	Explosive Simulator	10,299	0.03	0.00	0.03	0.02	0.00	0.00	0.09	0.00
Total Emissions			6.86	0.63	3.47	6.47	0.00	0.00	44.35	1.36

CH_4 = methane; CO = carbon monoxide; CO_2 = carbon dioxide; DODIC = Department of Defense Identification Code; EXP – expenditures; mm = millimeter; NOx = nitrogen oxides; NSN = National Stock Number; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; SO_x = sulfur oxides; TA = Test Area; TP-T = target practice and training; VOC = volatile organic compound; YR = year

B.2 Construction and Maintenance Emissions Calculations

AIR CONFORMITY APPLICABILITY MODEL (ACAM) DOCUMENTS

This section presents an export of results directly from the air quality modeling software, retaining the organizational headings and formatting produced by the software.

1. General Information

- Action Location

Base: EGLIN AFB
State: Florida
County(s): Okaloosa; Santa Rosa; Walton
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Eglin A and B Ranges Environmental Assessment

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2026

- Action Purpose and Need:

The purpose and need for the Proposed Action focus on three priority mission requirements: continuing mission access and scheduling, ensuring environmental compliance, and conducting National Environmental Policy Act (NEPA)-required analysis. The Department of the Air Force (DAF) has conducted comprehensive NEPA analysis for testing and training missions for many of the subject test areas and test sites (TAs/TSs), but not for others, particularly those with changing requirements or emerging usage. Environmental analysis is needed to account for potential mission- and environment-related changes to TAs/TSs, conditions, and missions that have occurred since completion of prior Range Environmental Assessments (REAs). Analysis of an authorized level of activity streamlines priority mission processes and ensures that environmental impacts and compliance with environmental regulations are fully considered.

- Action Description:

The Proposed Action involves environmental analysis to support ongoing and emerging mission requirements across the Eglin Test and Training Complex (ETTC). Activities include continued testing and training at TAs/TSs, road and infrastructure maintenance, routine range clearance activities, and minor construction and facility upgrades as necessary to support mission needs. The analysis accounts for recent and anticipated changes in mission requirements, updated operational demands, and compliance with environmental regulations.

Two alternatives were carried forward for analysis: the No Action Alternative and Alternative 1. The No Action Alternative reflects the current level of activity at TAs/TSs for which NEPA evaluations have been previously conducted. This activity level is based on the last five years of data on munitions expenditures and descriptions of existing programs and capabilities. The No Action Alternative also includes current road and range maintenance procedures.

Alternative 1 builds upon the No Action Alternative by incorporating activities and maintenance procedures at TAs/TSs that have not been previously analyzed under NEPA. Alternative 1 includes the installation of two new radar systems, minor construction, demolition, and land modification projects to support mission requirements. Alternative 1 has been identified as the Preferred Alternative, as it supports evolving mission needs while ensuring compliance with NEPA and other environmental regulations.

- Point of Contact

Name: Allison Williams
Title: Environmental Scientist

Organization: Leidos Corporation

Report generated with ACAM version: 5.0.23a

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Test Area/Site and Roads Maintenance

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location

County: Okaloosa; Santa Rosa; Walton

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Test Area/Site and Roads Maintenance

- Activity Description:

Test area/site and road maintenance under the No Action Alternative includes routine actions to ensure access and continued use of the test areas and test sites. These activities include grading, resurfacing, filling holes, and repairing washouts on unpaved roads, as well as patching potholes and replacing damaged sections of asphalt on paved roads. Maintenance of culverts and stream crossings may also occur as necessary to prevent erosion and maintain road usability.

For routine maintenance activities described in the No Action Alternative, it is assumed that approximately 10 miles of unpaved roads are subject to annual grading to maintain accessibility to test areas and sites. Based on standard unpaved road widths of 12 to 15 feet, this equates to approximately 792,000 square feet of area requiring grading each year. Grading activities are assumed to occur intermittently over the course of 12 months, with a start month of January. It is further assumed that 370 cubic yards of material will be hauled on-site annually to stabilize road surfaces, and 37 cubic yards of material will be hauled off-site annually as part of debris removal and routine maintenance.

Routine paving activities under the No Action Alternative include patching potholes and replacing damaged asphalt on existing paved roads to ensure continued access and usability of the test areas and range roads. It is assumed that approximately 10 miles of paved roads are subject to routine maintenance, with an assumed 5% of the total paved surface area requiring patching and repairs annually. Based on this assumption, approximately 31,680 square feet of paving is required each year.

Paving activities are assumed to occur intermittently over the course of 12 months, with a start month of January. These assumptions are consistent with the maintenance needs described in the No Action Alternative.

- Activity Start Date

Start Month: 1

Start Month: 2026

- Activity End Date

Indefinite: False

End Month: 12

End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.621072
SO_x	0.012474
NO_x	5.315389
CO	6.180321

Pollutant	Total Emissions (TONs)
PM 10	94.766499
PM 2.5	0.203344
Pb	0.000000
NH_3	0.006135

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.054903
N_2O	0.011542

Pollutant	Total Emissions (TONs)
CO_2	1361.013604
CO_2e	1365.824879

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.054903
N_2O	0.011542

Pollutant	Total Emissions (TONs)
CO_2	1361.013604
CO_2e	1365.824879

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 792000
Amount of Material to be Hauled On-Site (yd^3): 370
Amount of Material to be Hauled Off-Site (yd^3): 37

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Scrapers Composite [HP: 423] [LF: 0.48]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.19606	0.00488	1.74061	1.53912	0.06788	0.06245
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02381	0.00476	587.02896	589.04350
Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02160	0.00432	532.54993	534.37751
Scrapers Composite [HP: 423] [LF: 0.48]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02145	0.00429	528.85412	530.66901
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3

LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Paving Phase

2.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

2.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 31680

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
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HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

2.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

1. General Information

- Action Location
Base: EGLIN AFB
State: Florida
County(s): Okaloosa; Santa Rosa; Walton
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Eglin A and B Ranges Environmental Assessment

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2026

- Action Purpose and Need:
The purpose and need for the Proposed Action focus on three priority mission requirements: continuing mission access and scheduling, ensuring environmental compliance, and conducting National Environmental Policy Act (NEPA)-required analysis. The Department of the Air Force (DAF) has conducted comprehensive NEPA analysis for testing and training missions for many of the subject test areas and test sites (TAs/TSs), but not for others, particularly those with changing requirements or emerging usage. Environmental analysis is needed to account for potential mission- and environment-related changes to TAs/TSs, conditions, and missions that have occurred since completion of prior Range Environmental Assessments (REAs). Analysis of an authorized level of activity streamlines priority mission processes and ensures that environmental impacts and compliance with environmental regulations are fully considered.

- Action Description:
The Proposed Action involves environmental analysis to support ongoing and emerging mission requirements across the Eglin Test and Training Complex (ETTC). Activities include continued testing and training at TAs/TSs, road and infrastructure maintenance, routine range clearance activities, and minor construction and facility

upgrades as necessary to support mission needs. The analysis accounts for recent and anticipated changes in mission requirements, updated operational demands, and compliance with environmental regulations.

Two alternatives were carried forward for analysis: the No Action Alternative and Alternative 1. The No Action Alternative reflects the current level of activity at TAs/TSs for which NEPA evaluations have been previously conducted. This activity level is based on the last five years of data on munitions expenditures and descriptions of existing programs and capabilities. The No Action Alternative also includes current road and range maintenance procedures.

Alternative 1 builds upon the No Action Alternative by incorporating activities and maintenance procedures at TAs/TSs that have not been previously analyzed under NEPA. Alternative 1 includes the installation of two new radar systems, minor construction, demolition, and land modification projects to support mission requirements. Alternative 1 has been identified as the Preferred Alternative, as it supports evolving mission needs while ensuring compliance with NEPA and other environmental regulations.

- Point of Contact

Name: Allison Williams
Title: Environmental Scientist
Organization: Leidos Corporation

Report generated with ACAM version: 5.0.23a

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Construction of Two Radar Towers at TA A-73
3.	Construction / Demolition	General Description of Construction and Demolition Activities under Alternative 1

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location

County: Okaloosa; Santa Rosa; Walton
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construction of Two Radar Towers at TA A-73

- Activity Description:

Construction of two new radar systems at Test Area (TA) A-73 to support updated testing and training activities under Alternative 1. The new radar systems will be installed at two recently created test sites within TA A-73. This activity involves the construction of radar towers and associated infrastructure improvements to ensure operational readiness. No demolition is required as the previous radar is no longer in use. The construction activities will adhere to applicable management practices to minimize environmental impacts and will be addressed in future iterations of the Electromagnetic Radiation Environmental Assessment (EMR EA).

To estimate emissions associated with these activities, the following assumptions were made: Site grading for the radar towers is expected to begin in January 2026 and take approximately two months to complete, covering an area of 40,000 square feet, including the tower sites, access paths, and a small buffer zone. It is assumed that 1,000 cubic yards of material will be hauled on-site to support leveling and compaction, and 1,500 cubic yards of excavated soil and vegetation will be hauled off-site. Trenching for utility installations is anticipated to begin in March 2026, taking approximately two months and covering an area of 4,000 square feet. Trenching activities are expected to require 200 cubic yards of bedding material hauled on-site and 500 cubic yards of excavated soil and debris hauled off-site. Building construction is assumed to begin in May 2026 and take six months to complete. The radar towers are expected to occupy a total area of 10,000 square feet, with 5,000 square feet per tower site, and reach a height of 50 feet. Architectural coating is expected to begin in November 2026, taking one month to cover the external surfaces of both radar towers, totaling 10,000 square feet. Paving activities are anticipated to begin in December 2026, taking one month to complete and covering an area of 15,000 square feet, including access roads, parking areas, and operational surfaces. These assumptions were based on typical timelines and requirements for similar projects and may vary depending on site-specific conditions or final project specifications.

- Activity Start Date
Start Month: 1
Start Month: 2026

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.189951
SO_x	0.001354
NO_x	0.633605
CO	0.883660

Pollutant	Total Emissions (TONs)
PM 10	0.901531
PM 2.5	0.024017
Pb	0.000000
NH_3	0.002145

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.006054
N_2O	0.003281

Pollutant	Total Emissions (TONs)
CO_2	160.321880
CO_2e	161.450623

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.006054
N_2O	0.003281

Pollutant	Total Emissions (TONs)
CO_2	160.321880
CO_2e	161.450623

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 40000

Amount of Material to be Hauled On-Site (yd^3): 1000
Amount of Material to be Hauled Off-Site (yd^3): 1500

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**

Emission Factors	0.02160	0.00432	532.54993	534.37751
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)

HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 2
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 200
Amount of Material to be Hauled Off-Site (yd^3): 500

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipment Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02381	0.00476	587.02896	589.04350
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02385	0.00477	587.87714	589.89459
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 6
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 10000
Height of Building (ft): 50
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02138	0.00428	527.09717	528.90603
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517

MC	0.11230	0.00331	391.17366	394.96854

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL}* 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 1
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 10000
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751

HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 1
Number of Days: 0

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02133	0.00427	525.80405	527.60847
Rollers Composite [HP: 36] [LF: 0.38]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre ($43560 ft2 / acre)^2 / acre$)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location
County: Okaloosa; Santa Rosa; Walton
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: General Description of Construction and Demolition Activities under Alternative 1

- Activity Description:
Under Alternative 1, construction and demolition activities include minor construction, demolition, and maintenance projects across the A and B ranges over a seven-year period. These projects are designed to enhance testing and training capabilities while adhering to established range profiles and management practices to minimize environmental impacts. These activities are expected to include land clearing, grading, and construction of target structures, with careful siting to avoid sensitive areas and existing infrastructure. Additional minor construction activities may include facility improvements, target structure improvements, and land clearing distributed throughout the A and B ranges. Routine Test Area/Test Site (TA/TS) and road maintenance activities

are also included under Alternative 1 and encompass UXO retrieval and disposal, range debris clearance, vegetation management, and maintenance of range access and control infrastructure. Individual construction projects would generally disturb areas less than two acres, with a cumulative disturbance limit of 250 acres over the seven-year period, representing approximately 0.05% of Eglin Air Force Base's total land area.

For emissions estimation purposes under Alternative 1, construction and demolition activities are modeled to reflect an "average year" scenario. This approach distributes the maximum allowable quantities -- 250 acres (10,890,000 square feet) of site grating, an assumed 75,000 square feet of demolition, an assumed 1,000,000 square feet of trenching, an assumed 100,000 square feet of building construction, an assumed 100,000 square feet of architectural coating, and an assumed 500,000 square feet of paving -- evenly across a seven-year project period. By spreading these activities evenly, the emissions analysis represents typical annual impacts and accurately reflects the phased nature of the project. Under this "average year" scenario; annual emissions include 1,555,714 square feet of site grading, 10,714 square feet of demolition, 142,857 square feet of trenching, 14,286 square feet of building construction, 14,286 square feet of architectural coating, and 71,429 square feet of paving

To reflect a typical year within a seven-year project timeline, demolition activities are input into the module as beginning in January of 2026 and taking 12 months to complete. This approach distributes 75,000 square feet of demolition over seven years, translating to the removal of approximately 10,714 square feet of structures with an average building height of 30 feet annually. Demolition would occur periodically as part of minor construction, renovation, and maintenance projects. These activities support the goals of Alternative 1 by enabling allowing for facility modifications and facility improvements and the construction of new target structures, with impacts distributed occurring within existing range profiles across the A and B ranges.

Site grading is assumed to begin in January 2026 and is estimated to take 12 months. The total area of grading is estimated at 1,555,714 square feet. Approximately 57,619 cubic yards of material would be hauled on-site to support leveling and compaction, while 57,619 cubic yards of excavated soil, vegetation, and debris would be hauled off-site. Site grading activities would address the preparation of land for new target structures at TAs B-70 and B-75, as well as minor facility improvements across the ranges.

Trenching activities are estimated to take 12 months beginning in January 2026, covering an area of 142,857 square feet. These trenching activities would support the installation of infrastructure and utilities, including power and data lines and minor facility improvements described in Alternative 1. Approximately 42,350 cubic yards of bedding material, such as sand or gravel, would be hauled on-site, and 10,600 cubic yards of excavated soil and debris would be hauled off-site.

Building construction activities are assumed to take 12 months beginning in January 2026. Construction would involve a total building area of 14,286 square feet with an average building height of 30 feet. Building construction aligns with the goals of Alternative 1 to enhance testing and training capabilities through infrastructure improvements.

Architectural coating activities are estimated to take 12 months beginning in January 2026, covering a total area of 14,286 square feet. These coatings would include protective and weatherproofing applications for new target structures, facilities, and minor construction projects described in Alternative 1. Architectural coating supports the durability and operational readiness of new infrastructure across the ranges.

Paving activities are estimated to take 12 months beginning in January 2026, covering a total area of 71,429 square feet. Paving would include access roads, parking areas, facility improvements, and maintenance activities described in Alternative 1. These activities align with the infrastructure needs outlined in Alternative 1 and ensure accessibility and functionality of the constructed facilities.

- Activity Start Date
Start Month: 1
Start Month: 2026

- Activity End Date
Indefinite: False

End Month: 12
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.103179
SO_x	0.018322
NO_x	8.060228
CO	10.015585

Pollutant	Total Emissions (TONs)
PM 10	203.143025
PM 2.5	0.282993
Pb	0.000000
NH_3	0.025119

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.079322
N_2O	0.047863

Pollutant	Total Emissions (TONs)
CO_2	2120.525371
CO_2e	2136.767832

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.079322
N_2O	0.047863

Pollutant	Total Emissions (TONs)
CO_2	2120.521177
CO_2e	2136.763615

3.1 Demolition Phase

3.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

3.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 10714
Height of Building to be demolished (ft): 30

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.41257	0.00743	3.52633	4.31513	0.08509	0.07828
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02330	0.00466	574.35707	576.32812
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02160	0.00432	532.54993	534.37751
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

3.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (0.00042 * BA * BH) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL}* 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)

VMT$_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF$_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.2 Site Grading Phase

3.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

3.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1555714
Amount of Material to be Hauled On-Site (yd^3): 57619
Amount of Material to be Hauled Off-Site (yd^3): 57619

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rollers Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Scrapers Composite [HP: 423] [LF: 0.48]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19606	0.00488	1.74061	1.53912	0.06788	0.06245
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	586.91372	588.92786
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.54993	534.37751
Scrapers Composite [HP: 423] [LF: 0.48]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02145	0.00429	528.85412	530.66901
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705

LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

3.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.3 Trenching/Excavating Phase

3.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

3.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 142857
Amount of Material to be Hauled On-Site (yd^3): 42350
Amount of Material to be Hauled Off-Site (yd^3): 10600

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipment Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02381	0.00476	587.02896	589.04350
Other General Industrial Equipment Composite [HP: 35] [LF: 0.34]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02385	0.00477	587.87714	589.89459
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

3.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.4 Building Construction Phase

3.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

3.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 14286
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- **Vendor Trips Vehicle Mixture (%)**

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

3.4.3 Building Construction Phase Emission Factor(s)

- **Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)**

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287
Generator Sets Composite [HP: 14] [LF: 0.74]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839
Welders Composite [HP: 46] [LF: 0.45]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786

- **Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)**

Cranes Composite [HP: 367] [LF: 0.29]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

- **Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)**

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- **Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)**

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139

HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

3.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL}* 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.5 Architectural Coatings Phase

3.5.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

3.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 14286
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.5.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129

LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

3.5.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

3.6 Paving Phase

3.6.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 12
Number of Days: 0

3.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 71429

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.6.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gases Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.26860	0.00172	0.11494	4.59156	0.00364	0.00322	0.05129
LDGT	0.22958	0.00212	0.14451	3.87645	0.00408	0.00361	0.04304
HDGV	0.88395	0.00483	0.59039	11.06281	0.01969	0.01741	0.09480
LDDV	0.08708	0.00132	0.14749	6.56557	0.00364	0.00335	0.01705
LDDT	0.15078	0.00150	0.41118	5.60763	0.00583	0.00536	0.01751
HDDV	0.10944	0.00419	2.34024	1.60034	0.04742	0.04363	0.06571
MC	3.20770	0.00193	0.54558	12.49470	0.02291	0.02026	0.05171

- Vehicle Exhaust & Worker Trips Greenhouse Gases Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01351	0.00495	340.96759	342.77490
LDGT	0.01304	0.00715	419.83935	422.29139
HDGV	0.05499	0.02808	955.36623	965.09057
LDDV	0.04285	0.00073	393.05215	394.34113
LDDT	0.03067	0.00109	441.62237	442.71351
HDDV	0.01948	0.16187	1248.10200	1296.81517
MC	0.11230	0.00331	391.17366	394.96854

3.6.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL}* 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

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APPENDIX C
NOISE TECHNICAL INFORMATION

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NOISE TECHNICAL INFORMATION

C.1 SUPPORTING ANALYSES

C.1.1 Closest Sensitive Locations

The closest sensitive locations to each test area, which are summarized in Table C-1, were selected through visual interpretation of publicly available aerial photography (Google Earth, 2025). The locations listed are all residential areas.

Table C-1. Closest Off-Installation Noise-Sensitive Location

Test Area	Sensitive Location Universal Transverse Mercator (Zone 16R)		Representative Target Universal Transverse Mercator (Zone 16R)		Approximate Distance (miles) from Target/Detonation Location[1]
	Easting	Northing	Easting	Northing	
B-7	3370686	3370686	3370686	3370686	4
B-12	3370686	3370686	3370686	3370686	6.5
B-70	3370686	3370686	3370686	3370686	6
B-71	3370686	3370686	3370686	3370686	4
B-75	3370686	3370686	3370686	3370686	4.5
B-82	3370686	3370686	3370686	3370686	5.5
A-73	3370686	3370686	3370686	3370686	4.5
A-77	3370686	3370686	3370686	3370686	4
A-78	3370686	3370686	3370686	3370686	3
A-79	516423	3366448	516499	3370185	2
A-90	3370686	3370686	3370686	3370686	4

Source: (Google Earth, 2025)
Note:
1. Rounded to the nearest 0.5 mile

C.1.2 Peak Noise Level for Representative Munitions

Table C-2 lists distances from detonation location at which peak noise level drops below 115 decibels (dB) at peak pressure (dBP) (a level associated with moderate risk of complaints) for representative high-explosive (H-E) ordnance under acoustically average conditions. Representative munitions were selected for each test area to reflect the highest net explosive weight example munitions type listed in Table 2-2**.** In test areas for which higher net explosive weight munitions than are recorded in Table 2-2 have been previously assessed and found to not result in significant noise impacts, the previously assessed H-E munitions types was used as the representative munition. Inclusion of representative H-E munitions does not imply that the use of that munitions would become more common than it is under baseline conditions and/or the No Action Alternative. Calculated distances generally characterize noise associated with ongoing activities, which would not change in frequency of occurrence under the No Action Alternative relative to baseline conditions. Noise levels exceeding 115 dBP could be exceeded at greater than the distances shown due to unfavorable atmospheric conditions (e.g., high winds) or other factors. Distances were calculated using the BNOISE2 OneShot module.

Table C-2. Distance from Detonation Location to 115 dBP

Test Area	Representative H-E Ordnance	Approximate Distance to Annoyance Threshold (miles) (115 dBP)[1]
B-7	Mk-82	2.5
B-12	5,000-lb bomb	5.5
B-70	5,000-lb bomb	5.5
B-71	Mk-82	2.5
B-75	Mk-82	2.5
B-82	Mk-82	2.5
A-73	C-4 (4 lb)	1.5
A-77	Mk-82	2.5
A-78	Mk-82	2.5
A-79	No H-E munitions use	Not Applicable
A-90	No H-E munitions use	Not Applicable

dBP = decibels at peak pressure; H-E = high-explosive; lb = pound
Note:
1. Rounded to the nearest 0.5 mile

C.1.3 Screening-Level Assessment of Munitions Detonation Time-Average Noise Level (i.e., C-weighted day-night average sound level [CDNL])

As shown in Table C-3, estimated CDNL values are well below 62 dB CDNL (land use compatibility threshold) at the closest off-installation location to each test area as a result of munitions use. Time-averaged munitions detonation noise levels at the closest sensitive location to each test area were estimated based on the number of rounds fired per year under No Action and Proposed Action scenarios (see Section 2.2, No Action Alternative, and Section 2.3, Alternative 1 (Current Plus Future)). Large ordnance was represented using Mark 82 (500-pound class) bombs, large cartridge munitions were represented using 105-millimeter (mm) rounds, medium cartridge rounds were represented using 40-mm rounds, C-4 was represented using 10-kilogram charges, mines/grenades were represented using M67 grenades, and rocket/missile was represented using AGM-114 missiles. These representative munitions types reflect munitions at the high-end of net explosive weight for types used regularly at each test area, and therefore provide a conservative assessment of noise levels. Although larger munitions are permitted on some test areas, their use is very infrequent and is therefore not a major factor relevant to estimation of CDNL. Detonation of munitions simulators and miscellaneous explosive components do not generate noise levels sufficiently high to contribute to overall CDNL at the closest sensitive locations, and therefore were not included in calculations. Noise levels associated with these munitions were derived from the OneShot module of the program BNOISE2. Firing during the late-night period between 10:00 p.m. and 7:00 a.m., which is relevant to calculation of CDNL, was assumed to make up 10 percent of overall firing. CDNL was calculated assuming 250 days per year as per guidance in Army Regulation 200-1 (U.S. Army, 2007).

Table C-3. Screening-Level CDNL Estimates at Closest Sensitive Location

Test Area	Approximate Distance (miles) from Closest Off-Installation Noise-Sensitive Location	Approximate CDNL (dB)[1]
B-7	4	43
B-12	6.5	n/a
B-70	6	31
B-71	4	25

Table C-3. Screening-Level CDNL Estimates at Closest Sensitive Location

Test Area	Approximate Distance (miles) from Closest Off-Installation Noise-Sensitive Location	Approximate CDNL (dB)[1]
B-75	4.5	44
B-82	5.5	32
A-73	4.5	Not Applicable
A-77	4	46
A-78	3	49
A-79	No H-E munitions use	Not Applicable
A-90	No H-E munitions use	Not Applicable

CDNL = C-weighted day-night average sound level; dB = decibels; H-E = high-explosive
Note:
1. Rounded to the nearest 0.5 mile

C.1.4 Air Gunnery Noise Model

The Air Gunnery Noise Model calculates both single event and cumulative noise metrics associated with airborne firing of munitions (Ikelheimer et al., 2007). The following input parameters (Table C-4), which were used to calculate distances from the firing location to 115 dBP, are examples. Actual munitions employment parameters vary between missions.

Table C-4. Air Gunnery Noise Model Parameters and Distance to 115 dBP

Aircraft	Munitions Type	Firing Distance from Target (miles)	Firing Altitude (feet above ground level)	Firing Angle (degrees below horizontal)	Approximate Distance from Firing Location to 115 dBP (miles)[1]
AC-130J	105-mm howitzer	1.15	1,000–4,500	5–25	1.5
F-35	GAU-12 25 mm	1.15	1,000–4,500	5–25	1.5

dBP = decibels at peak pressure; mm = millimeter
Note:
1. Rounded to the nearest 0.5 mile

C.1.5 References

Google. (2005). Western Eglin Reservation (Google Earth version 7.3.6.9796), photo date November 2022, centered at UTM Zone 16R 519762 Easting, 3375407 Northing, eye altitude 14 miles. Accessed January 17, 2025.

Ikelheimer et al. (2007). Ikelheimer, B., Downing, Micah; James, M., & McInerny, S. *Airborne Weapons Noise Prediction Model.* NOISE-CON 2007. Reno, Nevada. October 22-24.

U.S. Army. (2007). *Army Regulation 200-1: Environmental Protection and Enhancement*.

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APPENDIX D
PUBLIC INVOLVEMENT

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APPENDIX E
FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

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FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

Introduction

This document provides the State of Florida with the Department of the Air Force's (DAF's) Consistency Determination under the Coastal Zone Management Act (CZMA) Section 307 and 15 Code of Federal Regulations (CFR) Part 930 sub-part C. The information in this Consistency Determination is provided pursuant to 15 CFR Section 930.39 and Section 307 of the CZMA, 16 United States Code Section (§) 1456, as amended, and National Oceanic and Atmospheric Administration regulations 15 CFR Part 930.

This Consistency Determination addresses the Proposed Action (Alternative 1) of the Draft Environmental Assessment (EA) for *Eglin A and B Ranges (Test Areas A-73, A-77, A-78, A-79, A-90, B-7, B-12, B-70, B-71, B-75, and B-82) at Eglin Air Force Base Florida*, which is to account for potential mission- and environment-related changes to test areas/test sites, conditions, and missions that have occurred since completion of prior Range EAs. Analysis of an authorized level of activity streamlines priority mission processes and ensures that environmental impacts and compliance with environmental regulations are fully considered.

Proposed Federal Agency Action

The Proposed Action represents a continuation of current activity levels at test areas/test sites previously analyzed under the National Environmental Policy Act (NEPA). The Proposed Action also represents additional testing and training activities, test area expenditures, test area and road maintenance, and new construction that have not been previously analyzed under NEPA. The actions previously analyzed under NEPA typically include air-to-ground and ground-to-ground missions. A detailed description of the test areas and associated testing and training activities that occur at each test area that has been previously evaluated under NEPA is provided in Section 2.3 of the EA. In addition to activities described in Section 2.3 of the EA, Alternative 1 would include two new threat radar systems at Test Area (TA) A-73.

Maintenance actions under Alternative 1 would potentially include routine retrieval and disposal of unexploded ordnance and range debris, clearance activities, target management, vegetation management, and maintenance of range access/control infrastructure.

There are no major construction projects planned for the test areas addressed in the EA. However, Alternative 1 includes typical minor future construction, demolition, renovation, and facility modifications that could potentially occur within the A and B Ranges over the next 7 years. These activities would be located within existing range profiles, and all management actions described in the EA would be followed. Individual projects would generally be under 2 acres and presumed to include impervious surface additions. These types of actions would be reviewed for environmental concerns through the Environmental Impact Analysis Process using Air Force Form 813. Under the EA, the total area of disturbance authorized over the 7-year period would not exceed 250 acres, which is approximately 0.05 percent of the Eglin Air Force Base (AFB) land area.

Federal Review

After review of the Florida Coastal Management Program and its enforceable policies, the DAF has determined that the Proposed Action would affect a Florida coastal use or resource. The following provides an analysis of the Proposed Action's consistency with the enforceable policies of the Florida Coastal Management Program.

The Florida Coastal Management Program is comprised of 24 Florida statutes. Statutes addressed as part of the Florida Coastal Zone Management Program consistency review are considered in the analysis of the Proposed Action and discussed in the following table (Table 1).

Table 1. Florida Coastal Management Program Consistency Review

Statute	Scope	Consistency
Chapter 161 *Beach and Shore Preservation*	This statute provides policy for the regulation of construction, reconstruction, and other physical activities related to the beaches and shores of the state. Additionally, this statute requires the restoration and maintenance of critically eroding beaches.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect beach and shore management, specifically as it pertains to the: • Coastal Construction Permit Program • Coastal Construction Control Line Permit Program The Proposed Action would not affect the state's management or preservation of beaches and shores and would not result in significant adverse impacts to beaches and shores of the state. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the protection of beaches and shore of the state.
Chapter 163, Part II *Intergovernmental Programs: Growth Policy; County and Municipal Planning; Land Development Regulation*	Provides for the implementation of comprehensive planning programs to guide and control future development of the state.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect local government comprehensive plans.
Chapter 186 *State and Regional Planning*	Provides direction for the delivery of governmental services, a means for defining and achieving the specific goals of the state, and a method for evaluating the accomplishment of those goals in regard to the state comprehensive plan.	The Proposed Action involves only construction and physical activities constrained to within the boundaries of the test areas at Eglin AFB analyzed in the EA. The Proposed Action would not affect state plans for water use, land development, or transportation.
Chapter 252 *Emergency Management*	Directs the state to reduce the vulnerability of its people and property to natural and man-made disasters; prepare for, respond to, and reduce the impacts of disasters; and decrease the time and resources needed to recover from disasters.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the state's vulnerability to natural disasters or emergency response and evacuation procedures.

Table 1. Florida Coastal Management Program Consistency Review

Statute	Scope	Consistency
Chapter 253 *State Lands*	Addresses the acquisition, administration, management, control, supervision, conservation, protection, and disposition of all state lands.	The Proposed Action would not result in significant adverse impacts to the conservation, protection, or disposition of state lands. There would be no significant impacts to physical resources including soils and geological resources (Section 3.5 of the EA) and water resources (Section 3.9 of the EA). Management practices identified in Section 3.5.2.4 and Section 3.9.2.5 of the EA would be implemented to minimize any potential impacts to state lands. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the acquisition, administration, management, control, supervision, conservation, protection, and disposition of state lands.
Chapter 258 *State Parks and Preserves*	Addresses the state's administration of state parks, aquatic preserves, and recreation areas.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the state's administration of state parks, aquatic preserves, and recreation areas.
Chapter 259 *Land Acquisitions for Conservation or Recreation*	Addresses public ownership of natural areas for purposes of maintaining the state's unique natural resources; protecting air, land, and water quality; promoting water resource development to meet the needs of natural systems and citizens of this state; promoting restoration activities on public lands; and providing lands for natural resource-based recreation.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect regulations regarding the management and conservation and recreation on state lands.
Chapter 260 *Florida Greenways and Trails Act*	Statewide system of greenways and trails established to conserve, develop, and use the natural resources of Florida for healthful and recreational purposes.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the Greenways and Trails Program.
Chapter 267 *Historical Resources*	Addresses the management and preservation of the state's archaeological and historical resources.	Potential impacts to cultural resources from the Proposed Action are analyzed in Section 3.4 of the EA. Any activities described in the EA that involve ground disturbance may potentially impact cultural resources. For existing activities, units would adhere to restrictions identified in EAFBMAN 13-212 (*Range Planning and Operations)* and implement standard operating procedures from the Eglin AFB Integrated Cultural Resources Management Plan. As per EAFBMAN 13-212, avoidance is generally the primary management practice for cultural resources. In the event of unexpected discovery of cultural resources, all

Table 1. Florida Coastal Management Program Consistency Review

Statute	Scope	Consistency
		activity in the immediate vicinity must cease until the proponent makes proper notification to the Base Historic Preservation Officer and Cultural Resources Office. Management practices identified in Section 3.4.2.4 of the EA would be implemented to minimize potential impacts to cultural resources. Therefore, the Proposed Action would be consistent with policies concerning cultural resources of the state.
Chapter 288 *Commercial Development and Capital Improvements*	Promotes and develops general business, trade, and tourism components of the state economy.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action is not anticipated to have any effect on future business opportunities on state lands, or the promotion of tourism in the region.
Chapter 334 *Transportation Administration*	Addresses the state's policy concerning transportation administration.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the state's policy concerning transportation administration.
Chapter 339 *Transportation Finance and Planning*	Addresses the finance and planning needs of the state's transportation system.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the finance and planning needs of the state's transportation system.
Chapter 373 *Water Resources*	Addresses sustainable water management; the conservation of surface and ground waters for full beneficial use; the preservation of natural resources, fish, and wildlife; protecting public land; and promoting the health and general welfare of Floridians.	Potential impacts to water resources from the Proposed Action are analyzed in Section 3.9 of the EA. The Proposed Action would not be expected to violate applicable state or federal water quality standards, or result in any other significant impacts to water resources. Implementation of standard construction and water quality management practices outlined in Section 3.9.2.5 of the EA would further reduce or eliminate impacts to estuarine waters. Therefore, the Proposed Action would be consistent with policies regarding water resources.
Chapter 375 *Outdoor Recreation and Conservation Lands*	Addresses the development of a comprehensive multi-purpose outdoor recreation plan, with the purpose to document recreational supply and demand, describe current recreational opportunities, estimate the need for additional recreational opportunities, and	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect opportunities for recreation on state lands.

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Table 1. Florida Coastal Management Program Consistency Review

Statute	Scope	Consistency
	propose the means to meet the identified needs.	
Chapter 376 *Pollutant Discharge Prevention and Removal*	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the transfer, storage, or transportation of pollutants.
Chapter 377 *Energy Resources*	Addresses regulation, planning, and development of the energy resources of the state; provides policy to conserve and control the oil and gas resources in the state.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect energy resource production, including oil and gas, and/or the transportation of oil and gas.
Chapter 379 *Fish and Wildlife Conservation*	Establishes the framework for the management and protection of the state of Florida's wide diversity of fish and wildlife resources.	Potential impacts to biological resources from the Proposed Action are analyzed in Section 3.3 of the EA. Biological resources could potentially be affected by direct physical impacts, habitat alteration, noise and other disturbance, and the introduction or spread of invasive species. With implementation of management practices (Section 3.3.2.4 of the EA), significant impacts to biological resources would not be expected. A Biological Assessment was prepared to support consultation with the US Fish and Wildlife Service under Section 7 of the Endangered Species Act. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the protection of fish and wildlife resources of the state.
Chapter 380 *Land and Water Management*	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not include changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing, or construction. Therefore, the Proposed Action would not affect land and water management.
Chapter 381 *Public Health: General Provisions*	Establishes public policy concerning the state's public health system.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect the state's policy concerning the public health system.
Chapter 388 *Mosquito Control*	Addresses mosquito control efforts in the state.	This enforceable policy is not applicable to the Proposed Action.

Table 1. Florida Coastal Management Program Consistency Review

Statute	Scope	Consistency
		The Proposed Action would not affect mosquito control efforts.
Chapter 403 *Environmental Control*	Establishes public policy concerning environmental control in the state.	Air quality impacts due to expenditure of munitions and construction activities from the Proposed Action are analyzed in Section 3.2 of the EA. No significant adverse impacts to air quality from expenditures were identified and minimal emissions in the context of regional annual air emissions from construction related activities were identified. Potential impacts to water resources from the Proposed Action are analyzed in Section 3.9 of the EA. No significant impacts to water quality were identified; however, adverse impacts to water resources may include sedimentation, contamination, and hydrologic alteration from mission expenditures and improper/inadequate maintenance, primarily at steam crossings. Management requirements identified in Section 3.9.2.5 of the EA would be implemented to minimize potential impacts to water resources. Potential impacts to the environment from hazardous materials/waste and debris are analyzed in Section 3.6 of the EA. No significant impacts would be anticipated in relation to hazardous materials/waste and debris with implementation of management actions outlined in Section 3.6.2.5 of the EA. Therefore, the Proposed Action would be consistent with the state's policy concerning water quality, air quality, pollution control, solid waste management, and other environmental control efforts.
Chapter 553 *Building Construction Standards*	Addresses building construction standards and provides for a unified Florida Building Code.	Planned actions that would potentially occur within the Eglin A and B Ranges include construction, demolition, renovation, and facility modifications. There are no major construction projects planned for the test areas addressed in the EA. All minor actions would be located within the existing range profiles. Management actions would be followed and would be reviewed for environmental concerns through the Environmental Impact Analysis Process with an Air Force Form 813.

Table 1. Florida Coastal Management Program Consistency Review

Statute	Scope	Consistency
		Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding building and construction standards.
Chapter 582 *Soil and Water Conservation*	Provides for the control and prevention of soil erosion.	Potential impacts to soils and geological resources from the Proposed Action are analyzed in Section 3.5 of the EA. There would be no significant impacts to soils associated with testing and training activities and test area and road maintenance. All applicable best management practices, such as erosion and sediment controls and stormwater management measures, would be implemented during construction, storm cleanup, and maintenance activities to minimize potential impacts to surrounding soils. Therefore, the Proposed Action would be consistent with the state of Florida's policies regarding the control and prevention of soil erosion.
Chapter 597 *Aquaculture*	Establishes public policy concerning the cultivation of aquatic organisms of the state. Addresses state aquaculture plan, which provides for the coordination and prioritization of state aquaculture efforts, the conservation and enhancement of aquatic resources, and provides mechanisms for increasing aquaculture production.	This enforceable policy is not applicable to the Proposed Action. The Proposed Action would not affect state aquaculture efforts or the conservation of aquatic resources.

Source: (Florida Department of Environmental Protection, 2024)
AFB = Air Force Base; EA = Environmental Assessment; EAFBMAN = Eglin Air Force Base Manual

Conclusion

The DAF has determined that the Proposed Action would affect a use or resource of the Florida coastal zone; however, the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the Florida Coastal Management Program.

The DAF respectfully requests your concurrence. Pursuant to 15 CFR § 930.41, the Florida State Clearinghouse has 60 days from receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension, in writing, under 15 CFR § 930.41(b). Florida's concurrence will be presumed if Eglin AFB does not receive its response on the 60th day from receipt of this determination. If you need additional information, or if you have any questions, please do not hesitate to contact Ms. Ilka Cole, 96 TW/PA, 1010 West D Avenue, Eglin AFB, FL 32542 or by email to 96CEG.CEIEA.NEPAPublicComments@us.af.mil.

References

Florida Department of Environmental Protection. (2024). *24 Florida Statutes of the Florida Coastal Management Program*. Retrieved from https://floridadep.gov/rcp/fcmp/content/24-florida-statutes-florida-coastal-management-program. September.

APPENDIX F
LIST OF PREPARERS

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1 # LIST OF PREPARERS

Name/Title	Project Role	Subject Area	Experience
Quentina Borgic, Environmental Scientist B.A., Anthropology B.A., Geography M.S., Geographic Information Science and Technology	Author	Cultural Resources	22 years
Jay Austin, Noise Analyst B.A., Biology M.S., Environmental Science	Author	Noise	25 years
Jason Koralewski, Archeologist M.A., Anthropology, M.L.S., Liberal Arts, B.A., Anthropology	Author	Soils and Water Resources	28 years
Rick Combs, Environmental Scientist M.S., Biology, B.S. Biology, B.S., Business Administration	Author	Biological Resources	23 years
Pamela McCarty, Environmental Analyst M.S., Industrial and Systems Engineering, M.A., Applied Economics, B.S., Business Administration	Author	Safety; Hazardous Materials and Waste/Debris	17 years
Jamie McKee, Environmental Scientist B.S., Marine Biology	Project Manager		38 years
Mike Nation, Environmental Scientist B.S., Environmental Science/Policy, Minor in Geography; A.A., General Science	GIS Analyst	Maps	24 years environmental science, GIS Arc View applications
Heather Stepp, Environmental Scientist B.S., Environmental Engineering Technology	Document Production, Editor	DOPAA Editing, Formatting, Document Management	28 years
Brian Tutterow, Senior Environmental Scientist B.A., Biology	Author	Children's Environmental Health and Safety	27 years
Jennifer Wallin, Environmental Scientist M.S., Environmental Toxicology B.S., Biology	References Manager, Editor	Formatting and References Management	26 years
Jessica Welsh, Editor B.A., Journalism	Document Production, Editor	Editing, Document Management	25 years
Allison Williams, Environmental Scientist M.S., Environmental Management, Minor in Natural Resource Management B.S., Environmental Health and Safety	Author	Air Quality	5 years

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