RCS 12-001

EGLIN AIR FORCE BASE
Florida

AIR AND GROUND GUNNERY: TEST AREAS A-73, A-77, A-78, A-79, B-7, AND B-75

FINAL RANGE ENVIRONMENTAL ASSESSMENT

June 2013

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FINDING OF NO SIGNIFICANT IMPACT

FOR

AIR AND GROUND GUNNERY: TEST AREAS A-73, A-77, A-78, A-79, B-7, AND B-75 RANGE ENVIRONMENTAL ASSESSMENT EGLIN AIR FORCE BASE, FLORIDA

RCS 12-001 (2013)

This finding, and the analysis on which it is based, was prepared pursuant to the President's Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) and its implementing regulations as promulgated at 40 Code of Federal Regulations (CFR) Part 1500 (40 CFR 1500–1508) plus:

- U.S. Air Force *Environmental Impact Analysis Process* as promulgated at 32 CFR Part 989.

The Department of the Air Force has conducted a Range Environmental Assessment (REA) of the potential environmental consequences associated with Air and Ground Gunnery (A&GG) training and testing activities at Test Areas (TAs) A-73, A-77, A-78, A-79, B-7, and B-75 at Eglin Air Force Base (AFB), Florida. The REA report is summarized below.

PURPOSE AND NEED (REA Section 1.2, page 1-4)

The purpose of and need for the Proposed Action is twofold:

1. Purpose: To quickly and efficiently process new programs requesting access to Eglin AFB training and test areas during both routine and crisis situations.

   Need: To provide military users a quick response to priority needs during war or other significant military involvement, as well as maintain the current approval process for routine uses.

2. Purpose: To update the NEPA analysis by reevaluating the mission activities and by performing a cumulative environmental analysis of all mission activities.

   Need: The need associated with this item is multifaceted and is described below.

Eglin AFB previously performed environmental analysis on mission activities as reported in the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 Programmatic Environmental Assessment* (U.S. Air Force, 2004) and on TA B-75 in the 2010 *Test Area B-75 Final Range Environmental Assessment (REA), Revision 1* (U.S. Air Force, 2010b). Currently, when approval for a new mission is requested, it may receive "categorical exclusion" (CATEX) from additional environmental analysis. If the action is similar to a mission that has been assessed previously and the assessment resulted in a finding of no significant environmental impact, it qualifies as included in the referenced analysis (CATEX 11). The CATEX designation is in accordance with NEPA and Air Force regulations, 32 Code of Federal Regulations (CFR) 989.13, Appendix B and Air Force Instruction (AFI) 32-7061.

However, since the 2004 assessment, some the mission activities have changed and could affect environmental analysis:

- Additional species have been given federal and state protection status.
- Species have been discovered that previously were not known to exist at Eglin AFB.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin AFB's borders has increased.
- AFIs have changed.
- Army and other Department of Defense instructions must be considered in range use and development.
- Range scheduling and types of use change to reflect military needs and mission.
- Weapons systems have evolved (e.g., F-35, CV-22, remotely piloted vehicles, new armored vehicles).

The combination of minor changes, maximizing the utility of training and test areas for the changing mission requirements, and the need to update the Biological Opinion, are the major drivers for this combined/revised REA. This also is an opportunity to consolidate like uses and simplify future analysis.

The analysis performed allows for a cumulative look at the impact from all mission activities on TAs A-73, A-77, A-78, A-79, B-7, and B-75 receptors. By implementing an authorized level of activity, Range management will be streamlined and cumulative environmental impacts will be considered more fully.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Proposed Action (REA Section 1.2, pages 1-4 to 1-6)

The Proposed Action is for the Air Force to establish an authorized level of activity for TAs A 73, A-77, A-78, A-79, B-7, and B-75, based on an anticipated maximum usage. By demonstrating that the individual and cumulative effects of this usage level would not result in significant environmental impacts, the Air Force would adopt this level of activity as the maximum threshold baseline. This level of activity is the Environmental Impact Analysis Process baseline. The environmental analysis was accomplished by evaluating the effect that the military air-mission activities (e.g., dispensing munitions such as bombs, missiles, and small arms, as well as countermeasures such as chaff and flares) and ground training mission (e.g., crossing terrain on foot, with all-terrain vehicles [ATVs], military vehicles, ground combat simulations, and live small arms use) have on Eglin AFB's natural, physical, and cultural environment.

No Action Alternative (REA Section 2.2.1, pages 2-1 to 2-2)

The No Action Alternative, as conventionally thought of, is not possible. The 2005 Base Realignment and Closure has already determined that the Eglin Test and Training Complex will

accommodate the activities of the 7th Special Forces Group (Airborne). This alternative is defined as authorizing the level of activity approved in the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 2004). Table 2-1 shows the previously approved level of activity under the No Action Alternative. This alternative also assumes the level of activity authorized in *TA B-75 REA, Revision 1* (U.S. Air Force, 2010b). The No Action Alternative does not authorize any level of activity for TA A-73 or include any additional ground operations.

Alternative 1 (REA Section 2.2.2, pages 2-3 to 2-7)

Alternative 1 is defined as authorizing the baseline level of mission activity under the No Action Alternative, with the addition of future foreseeable activities such as additional Army ground operations on existing roads (Table 2-2). These operations would be of similar size and scope to existing vehicle convoy training missions. Army ground operations would include use of the joint light tactical vehicle (JLTV) and mine-resistant ambush-protected (MRAP) vehicle, which are four-wheel drive armored vehicles weighing over 25,000 pounds (up-armored and loaded gross weight estimated at 40,000 pounds). It also would include traditional vehicles historically and currently used on these ranges (tow/recovery vehicles, lowboy vehicles, water purification system vehicles, conventional trucks, high-mobility multipurpose wheeled vehicles, suburban utility vehicles, and ATVs).

The Air Force Special Operations Command anticipates phasing out some of their HH-60 helicopter based operations in favor of a CV-22 platform. This would include small arms, chaff, and flare use on TAs A-77 and A-78, similar to what is approved already and conducted currently by the HH-60. CV-22 operations were not previously analyzed in the *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004).

Alternative 1 adds live fire small arms and light explosives (i.e., breach door) testing/training operations at TA A-73. Small arms live fire capability also was added to TA A-79. Further, any exceedances of authorized levels in the 2004 *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004), as observed in the 2010 *Range Utilization Report*, were incorporated into the anticipated expendable levels under Alternative 1. Additionally, any potential impacts from the use of new firing platforms (i.e., JLTV/MRAP or CV-22) were analyzed, although these vehicles generally would be used in the same capacity and manner as the previously analyzed activities.

Alternative 2 (REA Section 2.2.3, pages 2-7 to 2-8)

Alternative 2 is defined as authorizing the level of mission activity identified in Alternative 1, with the additional capability of a surge in the test and/or training mission. During wartime, and at other times, a surge in mission activity is necessary in order to maintain operational readiness.

This alternative includes authorization of the proposed level of activity and performance of a comprehensive environmental analysis to ensure that TAs A-73, A-77, A-78, A-79, B-7, and B-75 can support this level of activity without suffering significant environmental impact. This is the Preferred Alternative, because it includes all mission activities that are expected to occur and provides capacity for a test or training surge. This alternative authorizes an expected

maximum level of activity, which allows better responsiveness to the customer while ensuring that cumulative environmental effects do not cause significant impacts.

Preferred Alternative (REA Section 2.4, page 2-12)

The Preferred Alternative is Alternative 2, which includes the incorporation of additional expenditures and activities described under Alternative 1, with the addition of activity and expenditure surge capability. Implementation of management actions will allow a surge in test and training activities while minimizing impacts to environmental, natural, and cultural resources. The No Action Alternative and Alternative 1 are not expected to be sufficient to account for the expected changes in testing and training activities at Eglin AFB over the next 10 years. Therefore, Alternative 2 was selected as the Preferred Alternative to cover adequately the environmental analysis needed to support potential alternative or increased testing and training requirements as they occur.

The Preferred Alternative recognizes that Eglin AFB historically has experienced activity surges that do not last. The need to maintain a large safety buffer for the exceptional activities has had an overall positive effect in maintaining large undeveloped safety buffer areas of natural environment.

ENVIRONMENTAL IMPACTS

Analysis was conducted to determine the potential impacts to the human and natural environment resulting from the Proposed Action and alternatives. No significant impacts to resources have been identified under any of the alternatives (REA Section 2.3, pages 2-8 to 2-12), provided the management actions detailed in Chapter 5 (pages 5-1 to 5-7) of the REA would be implemented.

Chemical Materials/Range Debris (REA Section 3.1, pages 3-1 to 3-8) – Debris from ground troop movement and munitions fragments and residues would be generated as a result of testing and training missions. Debris should be managed in accordance with AAC Plans 32-5 and 32-9. Releases to the environment from munitions utilized in proficiency and qualification training require reporting to the U.S. Environmental Protection Agency (USEPA) under the Emergency Planning and Community Right-to-Know Act (EPCRA) Toxic Releases Inventory (TRI) Program. Eglin AFB has developed procedures to comply with TRI reporting requirements and would track ordnance use associated with the proposed alternatives.

Although the release of some chemicals would increase from the previously assessed baseline under all alternatives, no new TRI thresholds would be exceeded and adverse effects are not anticipated. Transport, storage, use, and disposal of hazardous materials and waste should be coordinated with Eglin AFB's 96th Civil Engineer Group/Environmental Compliance Branch, Pollution Prevention Section.

Soils (REA Section 3.2, pages 3-8 to 3-17) – There would be no significant impacts to soils under any of the alternatives. Increased munitions expenditures would not result in metal concentrations in the soil exceeding USEPA risk-based concentrations. Increased munitions

training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential.

Water Resources (REA Section 3.3, pages 3-17 to 3-28) – There would be no significant impacts to water resources under any of the alternatives. Increased munitions expenditures would not result in metal concentrations in groundwater exceeding USEPA risk-based concentrations. Surface water resources are located at distances from targets sufficient to minimize potential for contaminant transport, and sedimentation due to erosion would be controlled by management requirements. Wetlands would not be impacted, and no actions would modify the floodplain.

Biological Resources (REA Section 3.4, pages 3-28 to 3-45) – Wildlife, including sensitive animal species, potentially could be struck by ordnance, troops, vehicles, or other equipment. However, the frequency would not be great enough to cause population-level effects under any of the alternatives. Ground activities typically are conducted on roads, and troop movement through interstitial areas infrequency and low intensity. Ground-disturbing activities would be restricted in sensitive habitats, and Eglin AFB Natural Resources Section (96 CEG/CEVSN) personnel would conduct site surveys as necessary.

Noise would cause behavioral responses in wildlife, including sensitive bird and mammal species, such as startle reaction, flushing, and temporary area avoidance. Noise impacts to the red-cockaded woodpecker (RCW) are of primary concern. In general, RCWs would likely exhibit similar reactions, but individuals as well as the overall population on Eglin AFB are evidently tolerant of noise to some degree. Nesting has continued in close proximity to the test areas, and the population has increased. Eglin Natural Resources would evaluate activities on a case-by-case basis and determine the possibility for individuals to be unacceptably harassed.

The probability of burrowing owl or gopher tortoise burrow collapse due to impacts from munitions, troops, or vehicles is considered low. Similarly, the likelihood of direct physical strike of sensitive wildlife species, such as the eastern indigo snake and gopher frog, is considered remote. Wildfire caused by military activities has the potential to move off the test area boundaries and damage or destroy RCW trees or individual birds. However, implementation of management requirements would reduce this potential so that adverse effects are not likely. These requirements would provide protection for other wildlife species and habitats as well.

Under Alternative 2, surges in test and training activities could result in an increased number of direct strikes to wildlife species, but the probability would be low and significant effects would be unlikely. Increased wildfire potential could adversely impact sensitive plant communities, including RCW cavity trees. Nighttime fires could also directly impact roosting RCWs. Eglin Natural Resources has consulted with the U.S. Fish and Wildlife Service (USFWS) for RCW impacts related to wildfire, and a Programmatic Biological Opinion for RCWs on Eglin has been prepared. Management requirements would be implemented for all alternatives, and protection measures would benefit other wildlife species as well.

Overall, impacts to biological resources from the Proposed Action and alternatives would not be significant and are not likely to adversely affect sensitive species and their habitats. Implementation of management actions would minimize any negative effects from mission activities. Eglin AFB Natural Resources Section has conducted an Endangered Species Act Section 7 consultation with USFWS (REA Appendix H).

Cultural Resources (REA Section 3.5, pages 3-45 to 3-50) – No adverse effects to cultural resources would be expected under any of the alternatives with implementation of the following policies and procedures put forth in the Eglin AFB *Integrated Cultural Resources Management Plan* and Eglin AFB Instruction 13-212. Sites potentially eligible for listing in the National Register of Historic Places occur at TAs A-79 and B-75; these sites must be avoided. If avoidance of these resources is not possible, additional consultation with 96 CEG/CEVSH would be required in conjunction with additional testing, data recovery, or other forms of mitigation as necessary.

Furthermore, ground-disturbing activities must be avoided at Metts Cemetery outside B-75. Consultation with 96 CEG/CEVSH is required to obtain the latest information on known and unknown cultural resources before undertaking any ground-disturbing activities at any of the test areas.

Air Quality (REA Section 3.6, pages 3-50 to 3-55) – Impacts to air quality are not expected to be adverse under any of the alternatives. Concentrations of emissions would be within federal standards and would not cause adverse effects to the regional air quality.

Noise (REA Section 3.7, pages 3-55 to 3-59) – There would be no significant adverse impacts due to aircraft or ground-based noise under any of the alternatives. Noise levels associated with human annoyance would extend into off-base communities under all alternatives but noise levels considered to cause physiological damage would not. Certain test or training events should not be conducted in weather conditions that exacerbate noise effects.

Safety/Restricted Access (REA Section 3.8, pages 3-59 to 3-63) – Since the types of munitions to be used are the same or similar to the types currently used at A&GG test areas, implementation of the No Action Alternative, Alternative 1, or Alternative 2 would not be expected to prevent or significantly limit the ability of range managers to conduct explosive ordnance disposal and range maintenance activities. Safety footprints or surface danger zones would be employed for land-based training where live ordnance is used. In the case of the proposed 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.

Most areas on the Eglin Range, including A&GG test areas, have the potential for unexploded ordnance (UXO) contamination. Consultation and coordination with 96 CES/CED would mitigate any potential adverse impacts to Eglin AFB personnel from UXO. Although increases in the frequency of ordnance use would likely lead to increased instances of UXO, the current

safety policies and procedures would continue to ensure that there would be no adverse impacts from UXO.

Socioeconomics (REA Section 3.9, pages 3-63 to 3-71) – Minor and temporary noise impacts to the community are anticipated under all of the alternatives. Frequency of mission activities would increase under Alternative 1 and would be more frequent under Alternative 2, potentially resulting in a greater number of noise complaints. To minimize potential impacts, weather conditions should be considered prior to any detonation of explosive material and monitored during testing and training activities to prevent noise propagation beyond base boundaries.

Land Use (REA Section 3.10, pages 3-71 to 3-73) – There would be no changes to land use designation, so there would be no impacts to land use. There would be an increase in the potential for closures to recreational areas under all the alternatives, particularly under Alternative 2. However, closures would occur only for the duration of the activity and other areas would remain open for recreational purposes. Therefore, impacts to recreational resources are anticipated to be minor and temporary.

PUBLIC NOTICE

A public notice was published in the *Northwest Florida Daily News* on May 14, 2013, inviting the public to review and comment on the Draft-Final REA and Draft Finding of No Significant Impact. The public comment period closed on May 31, 2013, and no public comments were received. State agency comments were received (Appendix I, *Public and Agency Outreach*) and have been addressed in the Final REA.

PERMITS (REA Section 1.6, pages 1-10 to 1-11)

None required.

MANAGEMENT ACTIONS (REA Section 5.2, pages 5-1 to 5-7)

The REA was prepared with the expectation that the following management actions will be implemented for all activities on the test areas. Management actions are provided for each resource area, where applicable. Action proponents are responsible for ensuring these actions are taken.

Chemical Materials

The transport, storage, use, and disposal of hazardous materials and hazardous wastes associated with activities within test areas should be coordinated with Eglin AFB's 96th Civil Engineer Group/Environmental Compliance Branch, Pollution Prevention Section.

Hazardous waste must be disposed of according to regulations and AAC Plan 32-5, *Hazardous Waste Management Plan*. In compliance with AFI 13-212, munitions debris must be recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. Any dudded munitions or UXO must be flagged and removed according to standard procedures.

Soils and Water Resources

In compliance with AFI 13-212, munitions debris must be recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. Best management practices (BMPs) would be implemented to reduce and avoid potential impacts to soil, groundwater, and surface water at TAs A-73, A-77, A-78, A-79, B-7, and B-75 from deposition of munitions residues and erosion.

Although munitions may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA risk-based thresholds. Munitions expenditures, particularly air-to-surface bomb delivery training, air-to-surface gunnery operations, and surface-to-surface small arms training would contribute to increased soil erosion. The severity of these potential impacts could be diminished by implementing management requirements identified in the *Test Area B-75 Final REA* (U.S. Air Force, 2010b) and those discussed below.

The most pertinent BMPs, which would decrease impacts to soil quality and erosion, migration into groundwater, and transport to surface waters, are summarized as follows:

- Maintain a minimum 100-foot vegetated buffer between surface waters and bare soil testing areas.
- Do not establish any new cleared target areas within 200 feet of any natural water body.
- Adhere to *Eglin's Wildfire Specific Action Guide Restrictions* for pyrotechnics use.
- Detonations of explosives should not occur within 200 feet of water bodies.
- Immediately remove any ordnance that lands in streams bank areas and interior objectives, in accordance with Air Force regulations.
- Conduct target and ordnance debris removal and disposal of solid debris from blanks, chaff, smokes, and flares, in accordance with Air Force regulations.
- Employ bullet containment (for example, the bullet trap on A-73), lead projectiles management, and lead reclamation to reduce lead concentrations.
- Vehicles should remain on roads or established tracks and corridors.
- Conduct groundwater quality sampling as necessary near any open detonation pit.
- Minimize target vehicle placement on sloped areas, and restrict track vehicles operation in areas with a slope greater than 5 percent to help reduce erosion.
- Establish low-growing grassland communities on severely disturbed areas susceptible to erosion, reduce the frequency of vegetation management practices, and incorporate erosion control practices as needed on adjacent areas.
- Design concave slope segments on newly constructed targets and establish and/or maintain vegetative buffers on existing target sites.

- Relocate targets to areas on the test area less prone to erosion impacts and surface water contamination.
- Reduce slope gradients and avoid existing or potential unstable slopes.
- Do not conduct digging or other ground-disturbing activities without prior authorization.
- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Locate and design missions to avoid existing or potential unstable slopes, and to avoid reducing vegetative cover.
- Revegetate unstable slopes when feasible; maintain grassland buffers around target sites.
- Wood ash may also be utilized to raise soil pH.

Biological Resources

Noise

Firing activities should occur at regular intervals, when possible. Haphazardly timed and variable noise creates higher levels of disturbance to wildlife.

Wildfire Prevention

The largest potential agent for habitat alteration on and around the test areas is wildfire. The following measures would minimize the potential for wildfires:

- Follow Eglin's *Wildfire Specific Action Guide Restrictions* for pyrotechnics use by class day; specifically, do not conduct hot missions under class D or E levels as determined by the Wildland Fire Management Program at Jackson Guard.
- Through Jackson Guard, have sufficient resources (i.e., fire management personnel and equipment) available to respond to fire emergencies.
- Maintain graded road grid around gunship ranges to facilitate suppression in the event of a wildfire ignition.
- Use Eglin AFB's burn prioritization model to increase the prioritization of prescribed fire at the test areas, so that an approximately two-year burn interval is maintained around all these ranges to reduce hazardous fuel accumulations.
- Per the Eglin Wildfire Specific Action Guide, establish post-mission fire watch of 20 to 30 minutes to search for smoke/fire from mission activities, unless otherwise directed by Jackson Guard.
- Immediately notify Eglin Fire Department Dispatch of any wildfire started as a result of gunnery missions.

Red-cockaded Woodpecker

Wildfire impact to cavity trees is the biggest threat to RCW recovery on Eglin AFB. In addition to the wildfire measures listed above, implementation by the Eglin Natural Resources Section of the following would minimize RCW cavity tree mortality:

- Prepare RCW cavity trees before prescribed burns.
- When monitoring RCW cavity trees adjacent to these ranges, record cause of mortality.
- Replace any cavity tree damaged by fire to the point that it is unsuitable for nesting or roosting with an artificial cavity within 72 hours of the damage according to the *Eglin Air Force Base (AFB) Integrated Natural Resources Management Plan (INRMP) Biological Opinion (BO)* from USFWS. This will be accomplished by one or a combination of (1) retaining a contractor to install the artificial inserts, (2) partnering with the Gulf Coast Plain Ecosystem Partnership to install the artificial inserts, and (3) training Eglin Natural Resources Section personnel to install the artificial inserts.

Adherence to U.S. Army guidelines (U.S. Army, 2007) would minimize potential noise and disturbance to RCWs from ground movement activities. An important component is the recognition of a 200-foot buffer zone around individual RCW cavity trees where certain activities are restricted. USFWS has agreed with the U.S. Army that transient foot traffic within 200 feet of cavity trees would have no effect on RCWs, nor would transient vehicle traffic that stayed on existing roads. Transient activities are defined as those that involve maneuver-type training, have low-intensity human activity, and a short-term (less than two-hour) human presence. Activities that are not allowed within the 200-foot buffer zone include bivouacking and establishing command posts and excavating/digging.

Active and inactive RCW trees are marked with one band of white paint. The proponent may be required to mark 200-foot buffer zones around active RCW cavity trees potentially impacted by ground movements. Additionally, military activities that are within or near stands of mature long-leaf pine and scheduled during RCW nesting season (late April–July) should be coordinated with the Natural Resources Section. Monitoring of RCWs should also continue. A complete list of allowed and unallowed activities is provided in Table 1.

Additional RCW management requirements are as follows:

- Use of targets should be shifted to internally established targets that are away from active RCW cavity trees.
- Helicopter landing zones used for recurring activities must not be located within 500 feet of active RCW trees.
- Cutting of RCW cavity trees (marked with one band of white paint) is prohibited.
- Cutting of any long leaf pine trees are prohibited without prior authorization.

Table 1. Training Activities Within RCW Buffer Zones

Maneuver and Bivouac	Allowed
Hasty defense, light infantry, hands and tool digging only, no deeper than 2 feet, two hours maximum	Yes
Hasty defense, mechanized infantry/armor	No
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	Yes
Armored vehicle transit through the cluster	Yes
Cutting natural camouflage; hardwood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than two hours	Yes
Weapons firing	Allowed
7.62 mm and below blank firing	Yes
.50-caliber blank firing	Yes
Artillery firing point/position	No
MLRS firing position	No
All others	No
Noise	Allowed
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman type devices	Yes
Pyrotechnics/smoke	Allowed
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil and/or graphite flakes	Yes
Smoke grenades	Yes
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
HC smoke of any type	No
Digging	Allowed
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

CS = 2-chlorobenzalmalononitrile; CS/CSS = Combat Support/Combat Service Support; HC = hexachloroethane; MLRS = multiple launch rocket system; mm = millimeter; RCW = red-cockaded woodpecker

Flatwoods Salamander Habitat

- No off-road vehicle traffic, digging, or vegetation cutting is allowed with a 1,500-foot buffer of confirmed or potential flatwoods salamander habitat.
- Vehicles must remain on existing roads when moving through or near the 1,500-foot buffer.

- Do not release toxic aerosols within 1,500 feet of salamander ponds.
- South of the East Bay River, limit large troop movements (greater than 10 troops) to established roads.
- For training that will occur repeatedly in areas with flatwoods salamander habitat, field maps must include these locations so troops can appropriately apply the above requirements.

Eastern Indigo Snake

- If an eastern indigo snake is sighted, stop activities until the snake is out of harm's way.
- Notify Eglin Natural Resources Section of the sighting.

Gopher Tortoise

- If a gopher tortoise is sighted, stop activities until the tortoise is out of harm's way.
- Notify Eglin Natural Resources Section of the sighting.
- Do not drive over, step in, fill, or in any way cause a tortoise burrow to collapse.
- Avoid gopher tortoise burrows by at least 25 feet.
- Prior to any land clearing, coordinate with Eglin Natural Resources Section regarding required gopher tortoise surveys.

Florida Black Bear

- Take care to avoid hitting bears along roads.
- Allow bears to move out of harm's way before resuming activities.
- Notify Eglin Natural Resources Section if a live bear or road mortality is sighted.
- Properly dispose of waste to avoid attracting bears.
- Use bear-proof trash receptacles.
- Keep all food in airtight containers.

Gopher Frog

- No off-road vehicle traffic, digging, vegetation cutting, or pyrotechnics/munitions use is allowed within 100 feet of breeding ponds.

Florida Bog Frog

- No off-road vehicle traffic, digging, vegetation, or pyrotechnics/munitions use is allowed within 100 feet of bog frog streams.
- Remain in established roads when crossing bog frog streams.

Burrowing Owl

- For missions involving off-road vehicle use or other ground-disturbing activities near burrowing owl burrows, contact Eglin Natural Resources Section as it may be necessary to install markers near the burrows for avoidance.
- Stay at least 25 feet away from marked and unmarked burrows.

Cultural Resources

Sites on TAs A-79 and B-75 considered eligible and potentially eligible for the National Register of Historic Places must be protected until further testing is conducted. Protection includes avoidance by fencing, marking, or other means. Consultation with 96 CEG/CEVSH is required to determine locations that need to be avoided and protected. Furthermore, Metts Cemetery, located outside of the boundaries of TA B-75, must be avoided if ground-disturbing activities are planned.

For all of the test areas, location-specific cultural resource information is sensitive and being continuously updated. Consultation with 96 CEG/CEVSH is required to obtain the latest information for any ground-disturbing activities that might impact these areas. In addition, consultation with 96 CEG/CEVSH is required for any actions that could damage Cold War-era structures on B-75.

In the event that unknown cultural resources are discovered during a mission activity, all activity in the immediate vicinity must cease until the Base Historic Preservation Officer and 96 CEG/CEVSH have been notified and a determination of significance has been rendered.

- Leave any archaeological artifacts discovered in place and immediately report the location to the 96 CEG/CEVSH. If archaeological materials are discovered during construction or demolition activities, all actions in the immediate vicinity must cease and efforts taken to protect the find from further impact. Contact 96 CEG/CESVH immediately if a discovery occurs.
- Coordinate with the 96 CEG/CEVSH prior to any ground-disturbing activities beyond already-approved mission activities.
- Vehicle movements should be restricted near water bodies, on steep slopes, in areas where the soil is exceptionally soft or devoid of vegetation, and in areas where artifacts are located on the surface of the ground.
- The 96 CEG/CEVSH will be notified as early as possible in the planning process if modifications or demolitions to standing structures are to occur.

Noise

- Coordinate with the Eglin Safety Office to avoid conducting activities in weather conditions that may lead to hazardous noise impacts.

Safety and Restricted Access

- Implement safety profiles for land-based training where live ordnance is used.
- Implement personnel exclusion zones and appropriate safety buffers on live-fire ranges.
- Consultation and coordination with 96 CES/CED is required to protect personnel from UXO.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and the environmental analysis contained in the attached REA, and as summarized above, I find the proposed decision of the Air Force to implement the Preferred Alternative will not have a significant impact on the human or natural environment; therefore, an environmental impact statement is not required. This analysis fulfills the requirements of the NEPA, the President's CEQ, and 32 CFR Part 989.

SHAWN D. MOORE, Colonel, USAF
Commander, 96th Civil Engineer Group

9 JUL 2013
Date

AIR AND GROUND GUNNERY: TEST AREAS A-73, A-77, A-78, A-79, B-7, AND B-75

FINAL RANGE ENVIRONMENTAL ASSESSMENT

Submitted to:

96 TW/XPE
Range Environmental Planning Office
Eglin Air Force Base, FL 32542-6808

RCS 12-001

June 2013

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

33 FW	33d Fighter Wing
46 TW	(formerly) 46th Test Wing (currently the 96th Test Wing)
7SFG(A)	7th Special Forces Group (Airborne)
96 CEG/CEVSH	96th Civil Engineer Group/Cultural Resources Branch
96 CEG/CEVSN	96th Civil Engineer Group/Natural Resources Section
96 CES/CED	96th Civil Engineering Squadron/Explosive Ordnance Disposal Flight
96 TW	96th Test Wing (includes the former 46th Test Wing)
A&GG	Air and Ground Gunnery
AAC	Air Armament Center
ACM	asbestos-containing materials
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection and Health
AFPD	Air Force Policy Directive
AFSOC	Air Force Special Operations Command
AICUZ	Air Installation Compatible Use Zone
ALARNG	Alabama Army National Guard
AOC	area of concern
ATV	all-terrain vehicle (commercial and military)
BMPs	best management practices
BOD	biochemical oxygen demand
BRAC	Base Realignment and Closure
CAA	Clean Air Act
cal	caliber
CATEX	categorical exclusion; categorically excluded
CBA	Closed Box Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COC	community of comparison
CRIMS	Cultural Resources Information Management System
CS	2-chlorobenzalmalononitrile
CS/CSS	Combat Support/Combat Service Support
CWA	Clean Water Act
CY	calendar year
CZMA	Coastal Zone Management Act
dB	decibel
dbh	(tree) diameter at breast height
dBP	peak sound pressure
DO	dissolved oxygen
DoD	Department of Defense
DoDI	Department of Defense Instruction
DODIC	Department of Defense Identification Code
DOI	Department of the Interior
DU	depleted uranium
EA	Environmental Assessment
EAFBI	Eglin Air Force Base Instruction
EBD	Environmental Baseline Document
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS, CONT'D

EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ETTC	Eglin Test and Training Complex
F.S.	Florida Statutes
FAC	Florida Administrative Code
FAR	Federal Aviation Regulation
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FWPCA	Federal Water Pollution Prevention and Control Act
FY	fiscal year
GHG	greenhouse gas
HAP	hazardous air pollutant
HC	hexachloroethane
HE	high explosive
HFC	hydrofluorocarbons
HM	hazardous material
HW	hazardous waste
IJTS	Initial Joint Training Site
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
IWR	Impaired Waters Rule
JLTV	joint light tactical vehicle (military four-wheel drive vehicle)
JSF	Joint Strike Fighter
lb	pound(s)
L_{Cdn}	C-weighted day/night noise level
L_{dn}	day-night average
L_{eq}	equivalent sound level
$L_{eq(24)}$	24-hour equivalent noise level
µg/m³	micrograms per cubic meter
mg/kg	milligrams per kilogram
mg/m^3	milligrams per cubic meter
MLRS	multiple launch rocket system
mm	millimeter(s)
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
mph	miles per hour
MRAP	mine-resistant ambush protected (military four-wheel drive vehicle)
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAPS	Noise Assessment and Prediction System
National Register	National Register of Historic Places
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NEW	net explosive weight
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_x	nitrogen oxides
NSN	National Stock Number
NTU	Nephelometric Turbidity Unit
ORM	Operational Risk Management
OSHA	Occupational Safety and Health Administration
PAM	Public Access Map
PBG	Potential Breeding Group

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS, CONT'D

PEA	Programmatic Environmental Assessment
PFCs	perfluorocarbons
pH	potential of hydrogen (a measure of acidity)
PM	particulate matter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
PPA	Pollution Prevention Act
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
RBCs	risk-based criteria
RCRA	Resource Conservation and Recovery Act
RCW	red-cockaded woodpecker
REA	Range Environmental Assessment
ROI	Region of Influence
RR	Range Road
SDWA	Safe Drinking Water Act
SDZ	surface danger zone
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	state implementation plan
SPCC	Spill Prevention, Control, and Countermeasures
SPL	sound pressure level
SUV	suburban utility vehicle (commercial four-wheel drive vehicle)
SW	Special Waste
TA	Test Area
TRI	Toxics Release Inventory
TCP	traditional cultural properties
TRI-DDS	TRI-Data Delivery System
TT	Training Target
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United State Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
VOC	volatile organic compound

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1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

Eglin Air Force Base (AFB), located in the northwest Florida panhandle, is one of 19 component installations that make up the Department of Defense (DoD) Major Range Test Facility Base. The installation's primary functions are to support research and development of conventional weapons and electronic systems and to support multi-service air and ground training. Eglin AFB includes land assets (Figure 1-1), a number of cantonment areas, and the Eglin Test and Training Complex (ETTC). The ETTC is composed of four components and does not refer to the cantonment or main base areas:

- Training and test areas (TAs)/sites (Figure 1-2).
- Interstitial areas (areas beyond and between the defined boundaries of training and test areas).
- Water ranges (the Eglin Gulf Test and Training Range and estuarine and riverine areas).
- Airspace (over land and water).

The Air Force has responsibility for Eglin AFB and for all its users, which include the DoD, other government agencies, foreign countries, and private companies. For range operations, the Air Force provides environmental analyses and necessary National Environmental Policy Act (NEPA) documentation to ensure compliance with Air Force policy and applicable federal, state, and local environmental laws and regulations.

The Air Force accomplishes its range operations at Eglin AFB through the 96th Test Wing (96 TW, formerly the 46th Test Wing [46 TW]). The 96 TW commander is responsible for day-to-day scheduling and managing the maintenance of this national asset. TAs A-73, A-77, A-78, A-79, B-7, and B-75 make up a portion of the ETTC and support a variety of test and training missions. The continued DoD (all service) utilization of the ETTC requires flexible and unencumbered access to land ranges and airspace, which support Eglin AFB's operations.

Aircraft operations over the ETTC include live fire, either for training or testing. Any aircraft in the United States (U.S.) or international inventory may be operated for training or testing at Eglin AFB. Air operations are outside the scope of this Range Environmental Assessment (REA), and only munitions associated with these operations which utilize Air and Ground Gunnery (A&GG) training and test areas are evaluated. Live fire may include any and all conventional arms and munitions, as allowed on the specific range as evaluated in the appropriate REA and as outlined in Eglin Air Force Base Instruction (EAFBI) 13-212, *Range Planning and Operations* (U.S. Air Force, 2010a). Warheads may be live or inert depending on mission/training need and allowable range capacity. Live rounds are exactly the types used in warfare. Inert munitions contain less or no explosives.

Figure 1-1. Eglin AFB Region

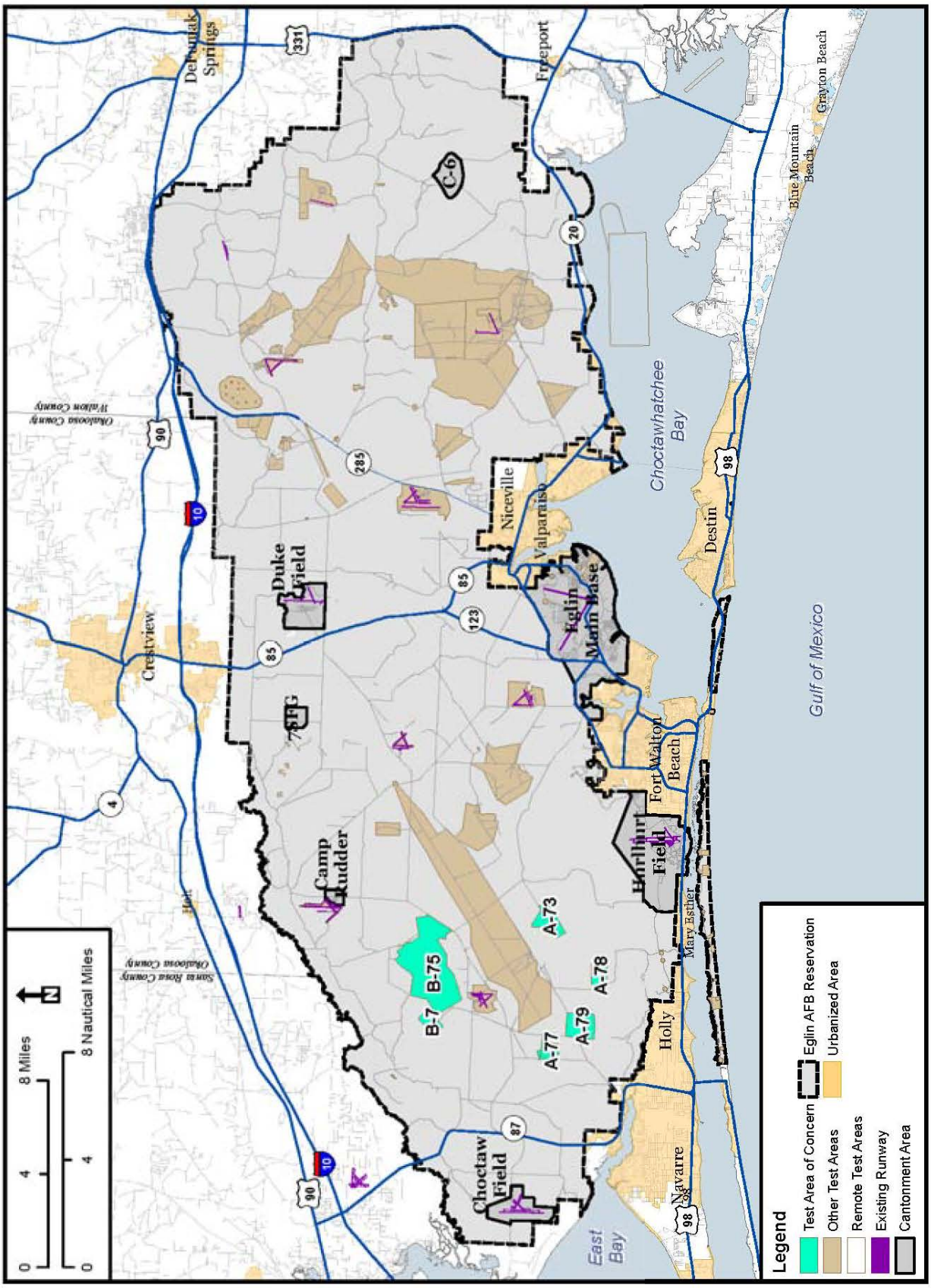

Figure 1-2. Training and Test Areas A-73, A-77, A-78, A-79, B-7 and B-75

Air and ground operations consist of air and ground forces exercising live fire together (gunships, fighters, bombers, remotely piloted vehicles, and rotary aircraft). This is a high-risk activity to the ground troops and is performed only at select ranges with capacity to safely accommodate this type of training. This capability is part of what makes the ETTC so critical to the Eglin AFB military mission.

The Air Force is analyzing the cumulative environmental impacts of all current and anticipated future operations conducted within TAs A-73, A-77, A-78, A-79, B-7, and B-75 on Eglin AFB (see Figure 1-2) in this REA. The purpose of this REA is to update the *Air-to-Ground Gunnery Range: A-77, A-78, A-79, and B-7 Programmatic Environmental Assessment* (U.S. Air Force, 2004), incorporate by reference the analysis conducted in the 2010 *Test Area B-75 Final Range Environmental Assessment (REA), Revision 1* (U.S. Air Force, 2010b), and to evaluate cumulative impacts associated with this mission and others on these training and test areas. This document also evaluates the environmental impacts of foreseeable future activities and the capability of a mission surge associated with wartime or other significant military involvement.

1.2 PROPOSED ACTION

The Proposed Action is for the Air Force to establish an authorized level of activity for TAs A-73, A-77, A-78, A-79, B-7, and B-75, based on an anticipated maximum usage. By demonstrating that the individual and cumulative effects of this usage level would not result in significant environmental impact, the Air Force would adopt this level of activity as the maximum threshold baseline. This is the Environmental Impact Analysis Process (EIAP) baseline. The environmental analysis is accomplished by evaluating the effect that the military air-mission activities (e.g., dispensing munitions such as bombs, missiles, and small arms, as well as countermeasures such as chaff and flares) and ground training mission (e.g., crossing terrain on foot, with all-terrain vehicles [ATVs], military vehicles, ground combat simulations and live small arms use) have on Eglin AFB's natural, physical, and cultural environment.

The military mission has been identified broadly as the effectors of environmental impacts and Eglin AFB's environment has been identified as the receptor. Evaluation and quantification of this effector/receptor relationship is the scientific basis for the environmental analysis performed in this report.

The purpose of and need for the Proposed Action is to quickly and efficiently process new programs requesting access to Eglin AFB training and test areas during both routine and crisis situations. The need is to provide military users (customers) a quick response to priority needs, and to update or validate the current approval process. Activities analyzed over seven years ago have increased and changed significantly due to the tempo of the wars that the United States is engaged in and the new technologies employed. As a result of these changes, it also will be necessary to update the Biological Opinion through a formal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) and to evaluate other key agreements as well.

Existing ETTC impact ranges have been studied for air delivered and ground test and training munitions (e.g., bullet, bomb, missile, and other test ordnance use). Several ranges have been utilized for aircraft/helicopter strafing/gunnery for decades (e.g., pilot/gunner training). The

increase in ground combat training generated by 2005 Base Realignment and Closure (BRAC) requires analysis of additional intensity and types of activities.

Eglin AFB previously performed environmental analysis on mission activities in the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 Programmatic Environmental Assessment* (U.S. Air Force, 2004) and on TA B-75 in the 2010 *Test Area B-75 Final Range Environmental Assessment (REA), Revision 1* (U.S. Air Force, 2010b). Currently, when approval for a new mission is requested, it may be categorically excluded (CATEX) from additional environmental analysis. If it is similar to a mission that has been assessed previously and the assessment resulted in a finding of no significant environmental impact, it qualifies as included in the referenced analysis (CATEX 11). The CATEX designation is in accordance with NEPA and Air Force regulations, 32 Code of Federal Regulations (CFR) 989.13, Appendix B and Air Force Instruction (AFI) 32-7061.

Some of the mission activities have changed and could affect environmental analysis:

- Additional species have been given federal and state protection status.
- Species have been discovered that previously were not known to exist at Eglin AFB.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin AFB's borders has increased.
- AFIs have changed.
- Army and other DoD instructions must be considered in range use and development.
- Range scheduling and types of use change to reflect military needs and mission.
- Weapons systems have evolved (e.g., F-35, CV-22, remotely piloted vehicles, new armored vehicles, etc.).

Safety requirements for high energy (fast, kinetic, or explosive) air deployed weapons represent a substantial interruption to scheduled surface training at Eglin AFB ranges (e.g., TAs B-88, C-52 complex, C-62). This in turn drives the effort to utilize other suitable training and test area ranges outside of the affected safety footprint, or to schedule multiple ranges for ground operations to make up for the lost training time. The 96 TW scheduling system takes into account the needs of training and test programs in an effort to better manage the range assets in an efficient manner.

The combination of minor changes, maximizing the utility of training and test areas for the changing mission requirements, and the need to update the Biological Opinion, are the major drivers for a combined/revised REA. This also is an opportunity to consolidate like uses and simplify future analysis.

The analysis performed in this report allows for a cumulative look at the impact on TAs A-73, A-77, A-78, A-79, B-7, and B-75 receptors from all mission activities. By implementing an authorized level of activity, Range management will be streamlined and cumulative environmental impacts will be considered more fully.

The Interstitial EA being completed at this time addresses the movement ***across*** the ETTC, and the use of simulated or blank munitions in areas ***between*** training and test areas. The transition from interstitial areas to live fire ranges may move the combat unit across the ETTC interstitial areas from the insertion point to the live fire range assigned. Small combat units working in the interstitial areas toward a range objective may need to avoid roads and practice cross country night navigation, with or without vehicle/air support. Once at their objective (i.e., the live fire range) they could be able to practice unit engagement under live fire conditions (not a current practice). This training could take place at night, as well as in daylight.

1.3 SCOPE OF THE PROPOSED ACTION

The region of influence (ROI) for this analysis is TAs A-73, A-77, A-78, A-79, B-7, and B-75 on the western side of the Eglin Range Complex in Okaloosa and Santa Rosa Counties, as shown in Figure 1-2.

This REA explores the cumulative activities and associated events of A&GG (e.g., ground combat training/air weapons deployment/aircraft gun fire) on Eglin AFB live fire ranges. The ranges are already cleared for live and simulated fire, missile impact, aerial bombardment, and aerial strafing though all activities are not authorized at all ranges. The previous 2004 study, *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004), covered TAs A-77, A-78, A-79, and B-7. TA B-75 was studied in 2010 in the *Test Area B-75 REA* (U.S. Air Force, 2010b), but will be included in this study for evaluation of overall impacts. The new ground live fire site on TA A-73 was awarded a CATEX based on its previous use as an air-to-ground target. This REA will combine the ranges used similarly, in the same geographic area (ETTC west ranges) to allow the Air Force to address the use, recovery and clean up of ranges more effectively. The availability of multiple similar ranges for combat live fire will increase scheduling flexibility to accommodate large-safety-footprint weapons with the least amount of interference with ground combat operations.

1.4 DECISION DESCRIPTION

The Air Force desires to authorize the projected activity for TAs A-73, A-77, A-78, A-79, B-7, and B-75, replacing the current authorized level, which is discussed in Section 2.2.1, No Action Alternative. A decision is to be made on the level of activity to be authorized, which includes changes in mission types, the combination of missions, and the level of intensity of missions. By authorizing a new level of activity and analyzing the effects of that level of activity, future similar actions may be categorically excluded from further environmental analysis. This will save both time and money in the review of proposed actions, and will enable users to access the studied ranges more quickly and efficiently. Authorization of a new level of activity will streamline the environmental process, enhancing the Air Force's ability to quickly respond to high-priority or crisis requirements.

1.5 ISSUES

Specifically, an issue may be the result of a mission activity or land use activity that may directly or indirectly impact physical, biological, and/or cultural resources. A *direct* impact is a distinguishable, evident link between an action and the potential impact, whereas an *indirect* impact may occur later in time and/or may result from a direct impact.

Potential environmental impacts of alternative actions on the Eglin AFB ranges resource areas were identified through preliminary investigation. Resource areas eliminated from further analysis are discussed in Section 1.5.1, Resource Areas Eliminated from Detailed Analysis. Resource areas identified for detailed analysis are described in Section 1.5.2, Resource Areas Identified for Detailed Analysis, with a summary of the preliminary screening for potential impacts.

1.5.1 Resource Areas Eliminated from Detailed Analysis

Environmental Restoration Program Sites

No active Environmental Restoration Program (ERP) sites, or sites subject to land use controls, are located within the studied training and test areas; therefore, there are no potential impacts to ERP sites.

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 AFI 13-212 and EAFBI 13-212, which requires the range to be cleared of munitions debris on a regular basis. Therefore, there are no potential impacts due to debris accumulation.

1.5.2 Resource Areas Identified for Detailed Analysis

Chemical Materials

Chemical materials encompass liquid, solid, or gaseous substances that are released into the environment as a result of mission activities; these include organic and inorganic materials that can produce a chemical change or toxicological effect to an environmental receptor. The chemical materials that can accumulate in the environment through repeated use represent the highest potential for environmental impact; for training and test areas, this includes the aluminum from chaff fibers, phosphorus from flares, and lead from munitions.

Soils

Soils within the ETTC have the potential to be impacted from training and test activities. Analysis addresses the potential for erosion from testing and training activities as well as for munitions residue to decrease soil quality by introducing new or additional organic and/or inorganic compounds into the soil matrix.

Water Resources

The Proposed Action has the potential to impact water resources within and around the ETTC. Water resource analysis addresses the potential for impacts to surface waters, wetlands, floodplains, and ground water from sedimentation and/or contamination by testing and training activities and associated expendables.

Biological Resources

Biological resources may be affected by the Proposed Action. Issues to be examined include: potential impacts on wildlife, sensitive species, and habitats from direct physical impact, habitat alteration, and noise. The direct physical impact is the physical harm that can occur to an organism (i.e., plant or animal) if it comes into contact with an effector, such as a bomb, shrapnel, or a vehicle.

Habitat alterations are described as the physical damage or perturbations to terrestrial and aquatic habitats. Habitat alteration can occur as a result of fire started by flares or munitions, or from soil disturbance associated with munitions. The main concern for impacts to protected species is the potential for wildfires caused by testing and training activities. Wildfires have the potential to leave the test area and cause damage to protected species and their habitats. Additionally gopher tortoise burrows, gopher frog ponds, and flatwoods salamander ponds may be impacted by direct physical contact with munitions or vehicles or by chemical expenditures.

Noise produced by missiles, munitions testing, and bomb testing may stress some wildlife species, or cause hearing loss/damage. Scientific data correlating the effects of noise on humans are well documented; however, information regarding the effects of noise events on wildlife species is limited.

Analysis focuses on identifying sensitive species and habitats within the training and test areas, analyzing the potential for impacts, and establishing management actions for the avoidance and/or minimization of identified potential impacts.

Cultural Resources

Potential effects to cultural resources would include disturbance or destruction of sites or artifacts. Physical disturbance and/or the destruction of cultural resources could occur from mission activities. Analysis will focus on cultural site locations and the likelihood of site disturbance and/or destruction.

There are cultural resource potential areas located within or very near the boundaries of all of the training and test areas. In addition, cultural restricted access areas are located within the southwestern portion of TA A-79. Additionally, several archaeological sites are located within or very near the outer boundaries of the training and test areas. Any planned activity that may result in impact to or modification of archaeological sites must be vetted through the 96th Civil Engineer Group/Cultural Resources Branch (96 CEG/CEVSH). In the event of inadvertent discovery of cultural resources, all activity in the immediate vicinity must cease until the proponent makes proper notification to the Base Historic Preservation Officer and the 96 CEG/CEVSH.

Air Quality

Testing and training operations would release emissions from munitions use. Analysis addresses the expected levels of emissions, and compares these levels with what is permitted currently from all Eglin AFB sources and county emissions.

Noise

Noise is defined as the unwanted sound produced by mission activity and its associated expendables. Noise may directly inconvenience and/or stress humans, and some wildlife species, and may cause hearing loss or damage. Analyses of potential noise impacts include discussions of two noise components: the physical overpressure and the acoustic sound. Noise is produced by bombs, guns, and artillery used on the ETTC. The analysis in the Biological Resources section identifies the potential for noise impacts to biological receptors, such as red-cockaded woodpeckers (RCWs).

Safety/Restricted Access

Safety involves the mitigation of hazards to military personnel and the public resulting from mission activities. Restricted access is typically the result of safety considerations. Restricted access applies to all range users, described in terms of the availability of Eglin AFB resources (such as test areas, interstitial/recreational areas, or public roads) to the general public. Potentially impacted receptors include military personnel and the public desiring to use these areas. Guidance for restricted access is utilized to coordinate public and military use of airspace, water space (e.g., the Gulf of Mexico), and land areas within the Eglin AFB ROI. Although all air-to-ground training and test areas are closed to all forms of public access, other restricted access issues may result due to brief or permanent closures of recreational areas that fall within the safety footprint of some missions.

Additionally, unexploded ordnance (UXO) poses a potential impact to safety. Training and test areas with known UXO require Explosive Ordnance Disposal (EOD) escort, and regulations regarding UXO should remain in place and continue to be followed. Potential UXO issues are identified and associated safety regulations are outlined.

Land Use and Recreation

Land use generally refers to human management and use of land. Specific uses of land typically include residential, commercial, industrial, agricultural, military, and recreational. Land use also includes areas set aside for preservation or protection of natural resources, wildlife habitat, vegetation, or unique features. Training and test areas are utilized solely for military training and testing activities. No change to current land use is expected; however, nearby land use and recreational activities potentially could be impacted by temporary access restrictions during certain testing and training activities.

Socioeconomics and Environmental Justice

Potential socioeconomic impacts include those that would expose low-income and minority populations to disproportionate negative impacts, or pose special risks to children (under

18 years old) due to noise, pollutant transport, and other conditions in the A&GG training and test areas ROI. The socioeconomic receptors include nearby communities and property that are impacted by the noise from Eglin AFB ordnance. Analysis focuses on the exposure of these communities to anticipated environmental effects and identifying whether potential concern areas were disproportionate to other communities in the region.

Cumulative Analysis

Cumulative analysis is to include related projects that border, use, or affect some or all of the studied ranges. The cumulative analysis looks at effects beyond the immediate study area to define the point that the effects are nullified by distance or time. Cumulative analysis is a brief listing of known interrelated activities, locations, and populations, and an analysis statement of what if any effects impact this activity or group and to what extent. An example would be the additive impacts of the reduction in TA B-75 Alabama Army National Guard (ALARNG) activity and the increased 7th Special Forces Group (Airborne) (7SFG[A]) and other user activity. The result is a balance back toward the levels of noise experienced 10 years ago from TA B-75. As the site is 4 miles or more from any civilian population, noise from those operations was dissipated normally by the distance. The new activity is an economic gain, a slight population increase, as studied in the *Proposed Implementation of the Base Realignment and Closure (BRAC) 2005 Decisions and Related Actions at Eglin AFB, Florida, Final Environmental Impact Statement* (U.S. Air Force, 2008), no net increase in air pollution, and stormwater best management practices (BMPs) still in place with some vegetative recovery evident.

1.6 FEDERAL PERMITS, LICENSES, ENTITLEMENTS, AND OTHER REGULATORY REQUIREMENTS

Pertinent regulations are provided in Appendix A, *Relevant Laws, Regulations, and Policies.*

Some components of this action would take place within, or otherwise may affect, the jurisdictional concerns of the Florida Department of Environmental Protection (FDEP); therefore, they will require a consistency determination with respect to Florida's Coastal Zone Management Plan under the Federal Coastal Zone Management Act (CZMA) (Appendix F, *CZMA Consistency Determination*).

Several laws and regulations are pertinent to the treatment of cultural resources, such as the National Historic Preservation Act of 1966 (NHPA), as amended; the Archaeological Resources Protection Act of 1979, and AFI 32-7065, *Cultural Resources Management*, which specifies proper procedures for cultural resource management at Eglin AFB. To comply with Section 106 of the NHPA, the Air Force will consult with the State Historic Preservation Officer (SHPO) on the potential impacts associated with this action. SHPO concurrence will be included in Appendix G, *Cultural Resources*.

The Air Force completed a Section 7 informal consultation with the USFWS in August 2004 for TAs A-77, A-78, A-79, and B-7. That Biological Assessment and USFWS concurrence is included in Appendix A of the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 REA.* The Air Force also completed a Section 7 informal consultation with the USFWS in June 2010 for TA B-75. That

Biological Assessment and USFWS concurrence is included in Appendix A of the 2010 *TA B-75 REA.*

A Section 7 formal consultation with the USFWS regarding impacts to federally listed species is necessary for future testing and training operations at TAs A-73, A-77, A-78, A-79, B-7, and B-75. Consultation with the USFWS would establish appropriate avoidance and minimization measures, as well as terms and conditions, to minimize impacts to threatened and endangered species. The Air Force conducted Section 7 formal consultation with the USFWS. The resulting consultation document is included in Appendix H, *ESA Section 7 Consultation (Biological Assessment)*.

A public notice was published in the *Northwest Florida Daily News* on May 14, 2013, inviting the public to review and comment on the Draft REA and Draft Finding of No Significant Impact. The public comment period closed on May 31, 2013, and no public comments were received. State agency comments were received (Appendix I, *Public and Agency Outreach*) and have been addressed in this Final REA.

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2. ALTERNATIVES

2.1 INTRODUCTION

This section introduces the alternatives that will be evaluated for potential environmental impacts in this REA for TAs A-73, A-77, A-78, A-79, B-7, and B-75. The proposed alternatives, which are analyzed in this document, are listed below.

- No Action Alternative: Baseline, as defined by the Preferred Alternative in the 2004 Air-to-Ground Gunnery PEA (U.S. Air Force, 2004) and 2010 TA B-75 REA, Revision 1 (U.S. Air Force, 2010b).
- Alternative 1: Authorize current level of activity plus foreseeable future activities, specifically those on A-73 and the other included ranges.
- Alternative 2 (Preferred Alternative): *Alternative 1* plus mission sustainability surge or one-time action capability.

A brief description of each alternative, including the alternative-specific expendables, is provided in the following section.

2.2 ALTERNATIVES CONSIDERED

2.2.1 No Action Alternative

The No Action Alternative, as conventionally thought of, is not possible. The 2005 BRAC has already determined that the ETTC will accommodate the activities of the 7SFG(A). This alternative is defined as authorizing the level of activity approved in the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 PEA* (U.S. Air Force, 2004). Table 2-1 shows the previously approved level of activity under the No Action Alternative. This Alternative also assumes the level of activity authorized in *TA B-75 REA, Revision 1* (U.S. Air Force, 2010b). The No Action Alternative does not authorize any level of activity for TA A-73, or include any additional ground operations.

Table 2-1. Summary Baseline Expendables Used at Training and Test Areas A-77, A-78, A-79, B-7 and B-75

Test Area	Ordnance	Baseline Expendable Use	Baseline Expendable NEW (lb)
A-77	Bomb – inert	560	0.07
	Flare	288	0.21
	Gun – inert	144,188	288.88
	Gun – live	243,718	42,972.74
	Missile – live	4	4.55
	Small Arms – inert	316	0.27
	Small Arms – live	3,799,134	14,402.52
	Smoke	800	0.42
	Miscellaneous Expendables	79,534	5.01
	Total	**4,268,542**	**57,675**
A-78	Bomb – inert	112	0.01
	Flare	206	0.15
	Gun – inert	100,122	200.59
	Gun – live	190,178	33,532.48
	Missile – live	12	13.66
	Small Arms – live	2,838,380	10,760.30
	Small Arms – inert	560	0.47
	Miscellaneous Expendables	73,212	4.61
	Total	**3,202,782**	**44,512**
A-79	Bomb – live	8	1,228.80
	Miscellaneous Expendables	35,534	2.24
	Total	**35,542**	**1,231**
B-7	Flare	4	0.00
	Gun – inert	64,930	130.09
	Gun – live	122,818	21,655.46
	Miscellaneous Expendables	48,326	3.04
	Total	**236,078**	**21,789**
B-75	Bombs	4,112	1,935
	Smokes	1,000	0.53
	Flares	78,601	58.32
	Explosives	519,676	472,905.16
	Missiles	1,228	1,397.46
	Rockets	1,928	1.10
	Small Arms - live	16,710,123	63,348.08
	Miscellaneous Expendables	148	0.01
	Total	**17,316,816**	**537,711**
	Grand Total	**25,059,760**	**662,918**

Source: Data obtained from the selected alternative (Alternative 2) in the 2010 TA B-75 REA (U.S. Air Force, 2010b).
lb = pound(s); NEW = net explosive weight

2.2.2 Alternative 1: Authorize Current Level of Activity Plus Foreseeable Future Activities

Alternative 1 is defined as authorizing the baseline level of mission activity identified in the No Action Alternative, with the addition of future foreseeable activities such as additional Army ground operations on existing roads (Table 2-2). These operations would be of similar size and scope to existing vehicle convoy training missions. Army ground operations would include use of the joint light tactical vehicle (JLTV) and mine-resistant ambush-protected (MRAP) vehicle which are four-wheel drive armored vehicles weighing over 25,000 pounds (up-armored and loaded gross weight is estimated at 40,000 pounds). It also would include traditional vehicles historically and currently used on these ranges (tow/recovery vehicles, lowboy vehicles, water purification system vehicles, conventional trucks, high-mobility multipurpose wheeled vehicles, suburban utility vehicles and ATVs.

The Air Force Special Operations Command (AFSOC) anticipates phasing out some of their HH-60 helicopter based operations in favor of a CV-22 platform. This would include small arms, chaff, and flare use on TA A-77 and A-78 similar to what is approved already and conducted currently by the HH-60. CV-22 operations were not previously analyzed in the *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004).

Under Alternative 1, small arms test and training capability would be added to TA A-73. In August 2010, a rubber chunk-style ballistic containment system (i.e., a bullet trap) was installed on the western portion of TA A-73, though no operations were conducted on this range according to the Range Utilization Report. This system would be used for all live fire test/training. Further, it is anticipated that breach wall training operations may be incorporated in this area. Breach wall training would consist of approximately eight classes annually, composed of ten military personnel, detonating a maximum of 4 pounds of plastic explosive, twice per month. By authorizing this level of activity, similar mission requests may be approved quickly and efficiently.

Alternative 1 adds live fire small arms and light explosives (i.e., breach door) testing/training operations at TA A-73. Small arms live fire capability also was added to TA A-79. Further, any exceedances of authorized levels in the 2004 *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004), as observed in the 2010 Range Utilization Report, were incorporated into the anticipated expendable levels under Alternative 1. Additionally, any potential impacts from the use of new firing platforms (i.e., JLTV/MRAP or CV-22) were analyzed though these vehicles generally would be used in the same capacity and manner as the previously analyzed activities.

A training event may last two weeks or more and include multiple training objectives, including air components as well as ground components. Aircraft-dependant operations would include airdrop of personnel and equipment on approved drop zones, assault landings on approved landing zones, infiltration/exfiltration of troops via land or air to include fast rope/hoist operations, electronic countermeasure training, and urban escort, as well as other in-air operations that are beyond the scope of this REA.

Table 2-2. Alternative 1: Summary Expendables Used at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Test Area	Ordnance	Baseline Expendable Use	Baseline Expendable NEW (lb)
A-73	Small Arms – live	500,000	1,895.50
	Explosives	96	87.36
	Total	**500,096**	**1,982.86**
A-77	Bomb – inert	560	0.07
	Flare	15,798	11.72
	Gun – inert	144,188	288.88
	Gun – live	454,272	80,087.62
	Missile – live	4	4.55
	Small Arms – inert	31,722	26.65
	Small Arms – live	3,799,134	14,402.52
	Smoke	890	0.47
	Miscellaneous Expendables	79,534	5.01
	Total	**4,526,102**	**94,827**
A-78	Bomb – inert	112	0.01
	Flare	15,798	11.72
	Gun – inert	100,122	200.59
	Gun – live	454,518	80,141.33
	Missile – live	12	13.66
	Small Arms – live	2,838,380	10,760.30
	Small Arms – inert	7,930	6.66
	Smokes	394	0.21
	Miscellaneous Expendables	73,212	4.61
	Total	**3,490,478**	**91,139**
A-79	Bomb – live	8	1,228.80
	Miscellaneous Expendables	35,534	2.24
	Small Arms - live	887,685	3,365.21
	Total	**923,227**	**4,596**
B-7	Flare	6,689	4.96
	Gun – inert	64,930	130.09
	Gun – live	160,271	28,255.59
	Small Arms - live	2,475	9.38
	Miscellaneous Expendables	48,326	3.04
	Total	**282,691**	**28,403**
B-75	Bombs	4,112	1,935
	Smokes	1,000	0.53
	Flares	78,601	58.32
	Explosives	519,676	472,905.16
	Missiles	1,228	1,397.46
	Rockets	1,928	1.10
	Small Arms - live	16,710,123	63,348.08
	Miscellaneous Expendables	148	0.01
	Total	**17,316,816**	**537,711**
	Grand Total	**27,039,410**	**758,659**

Source: Data obtained from the selected alternative (Alternative 2) in the 2010 TA B-75 REA (U.S. Air Force, 2010b).
lb = pound(s); NEW = net explosive weight

Ground training will involve troop infiltration/exfiltration; airdrops of personnel and equipment; call-for-fire; personnel recovery; terminal attack control; survival, evasion, resistance, escape; and sniper/survey reconnaissance. All of these activities are currently scheduled daily on the ranges by 1 SOW, 720 STG, 7SFG(A), and the HAVE ACE Program LNO (USSOCOM) residing at Hurlburt Field. Ground activity insertions/extraction typically would involve teams of up to 12 in approved areas. Other ground training events would consist of primarily single scheduled events for marksmanship training, combat marksmanship movement drills, dismounted movement drills, direct control close air support, close quarter battle, breaching (explosive, mechanical, and ballistic), light arms training, light demolition training, mounted maneuver training, and advanced urban combat training.

Table 2-3 summarizes the currently approved uses of each range, as determined in EAFBI 13-212.

Table 2-3. Summary of Currently Approved Capabilities and Uses at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Test and Training Area	Capabilities and Uses	General Description	Authorized Munitions
A-73	Primarily used for mobile electronic systems for ground and flight tests such as a centralized bore sight tower facility and electronic systems test facility. Ground forces use the extreme western portion of A-73 for tactical training at a small arms firing range.	A-73 is a cleared area of about 1,290 acres and is located approximately 12 miles west of Eglin Main. This area is used for basing mobile air defense systems at test sites A-30 and A-31 located on the eastern side of A-73. Test sites A-30 and A-31 are improved fenced compounds with permanent concrete pads for locating multiple radar systems, gravel parking areas, several instrumentation and workbench trailers, four 120-foot test towers, and several bore sight and calibration towers.	Military-issue rifles, sniper rifles, submachine guns and pistols, all calibers and jacketed "ball" or "frangible ball" type ammunition up to 7.62 mm. Pyrotechnics, simulators, simunitions, and blank ammunition.
A-77	A-77 is used for tactical air-to-ground training in gunnery, bombing, and rocketry delivery. Dud-producing munitions can be employed in the designated ¾-mile-square dedicated impact area. Ground forces use this site as a tactical maneuver and live fire range. AFSOC has constructed an Urban Close Air Support Training Facility on the north side of A-77, and organizations wanting to schedule this facility must get approval from AFSOC prior to execution.	A-77 is an unscored, tactical air-to-ground target area located approximately 20 miles west of Eglin Main. This target area is ¾-mile square and contains various tactical targets such as vehicle convoys, bivouac areas, and gun emplacement. A Close Quarter Battle Site, Urban Close Air Support Training Facility, and improved HLZ (two spot) is located in the northwest corner of this test area.	Ground personnel: .38-cal, .45-cal, 7.62-mm, 9-mm, 5.56-mm, .50-cal, 40-mm TP grenades, smoke pots, signal and illumination flares, pyrotechnics, up to 5 pounds of TNT or C4, TOW-2, 66-mm LAW, and 84-mm AT-4s. Aerial: 7.62-mm, .50-cal, 20-mm, 25-mm, 30-mm, 40-mm, 40-mm TP grenades, 105-mm, 2.75-and 5.00-inch unguided rockets (TP/HE/WP), TOW-2, illumination flares and markers. Inert general purpose bombs:

Table 2-3. Summary of Currently Approved Capabilities and Uses at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Test and Training Area	Capabilities and Uses	General Description	Authorized Munitions
			MK-82, MK-83, MK-84, MK76, MK-106, MK-117, BDU-33, BDU-45, BDU-48, BDU-50, BDU-56.
A-78	A-78 is used for tactical air-to-ground training in gunnery, bombing, and rocketry. Ground forces use this area as a tactical maneuver and live fire range. Dud producing munitions can be employed in the designated target area.	A-78 is an unscored tactical air-to-ground target area located approximately 6 miles northwest of Hurlburt Field. This target area is an approximately ¾-mile-square dudded impact area and contains various tactical targets such as vehicle convoys, bivouac area, missile site, and gun emplacement. Ground forces use this site as a tactical maneuver and live fire range.	Ground personnel: .38-cal, .45-cal, 7.62-mm, 9-mm, 5.56-mm, .50-cal, 40-mm TP grenades, smoke pots, signal and illumination flares, pyrotechnics, M18A1 Claymore anti-personnel mines, quarter stick of TNT or C4, and M72A1 LAW. Aerial: 7.62-mm, .50-cal, 20-mm, 25-mm, 30-mm, 40-mm, 40-mm TP grenades, and 105-mm. DU is not authorized on this range. Also approved are 2.75-and 5.00-inch TP/HE/WP rockets and illumination flares and markers. Inert general purpose bombs consist of: MK-82, MK-83, MK-84, MK-76, MK-106, MK-117, BDU-33, BDU-45, BDU-48, BDU-50, and BDU-56.
A-79	A-79 has been used for a tactical air-to-ground test and training area with capability for air-to-water when the pond is filled.	A-79 is an unmanned, unscored tactical air-to-water target area located approximately 7 miles northwest of Hurlburt Field. In the past it included a water target area when the pond was filled.	9 mm, 5.56 mm, 7.62 mm, and .50 cal. The size of munitions that can be expended on A-79 is set by Range Safety on a case-by-case basis.
B-7	B-7 is used for side-firing weapon systems tactical air-to-ground training. Dud-producing munitions are authorized in the designated target area.	B-7 is a sparsely wooded area approximately 1 mile long by ½ mile wide adjacent to the northwest corner of B-75. This area is located approximately 18 miles northwest of Eglin Main.	25 mm, 30 mm, 40 mm,105 mm, illumination flares and markers. The size of munitions that can be expended on B-7 is set by Range Safety on a case-by-case basis.
B-75	B-75 is a multipurpose range used for air-to-ground, ground-to-air, air-to-air, and ground-to-ground tests. Air-to-ground tests include bombing, rocketry, and missiles. Targets may be of the stationary type, or remote-controlled moving vehicles may be used. Ground-to-air and air-to-air tests include missiles against remotely piloted vehicles. Ground-to-ground tests include guns and missiles against stationary and	B-75 is a cleared rectangular area 3½ by 1½ miles located approximately 15 miles northwest of Eglin Main. The primary entry to B-75 is from RR 213.	Ground personnel: 5.56 mm, 7.62, 9 mm, .50 cal, 40 mm grenades (inert), LAW (inert), C4 and TNT bare charges Aerial: 7.62 mm and .50 cal Range Safety sets the size of munitions on a case-by-case basis. The maximum NEW used on B-75 to date is 12,800 pounds.

Table 2-3. Summary of Currently Approved Capabilities and Uses at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Test and Training Area	Capabilities and Uses	General Description	Authorized Munitions
	remote controlled moving targets. Munitions can be scored post-mission by survey or Contraves cinetheodolites located on or adjacent to the test area. Three of these cinetheodolites can track items to the ground over most of the test area. A target complex including stationary, moving, and pop-up targets operated and maintained by the ALARNG is located on the range. B-75 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. Items tested on B-75 range from small munitions to stacks of numerous 500-pound bombs.		

ALARNG = Alabama Army National Guard; ASFOC = Air Force Special Operations Command; cal = caliber; DU = depleted uranium; HE = high explosive; mm = millimeter; NEW = net explosive weight; RR = Range Road

2.2.3 Alternative 2: Alternative 1 Plus Mission Surge Capability

Alternative 2 is defined as authorizing the level of mission activity identified in Alternative 1, with the additional capability of a surge in the test and/or training mission (Table 2-4).

Table 2-4. Alternative 2: Summary of Expendables Used at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Test Area	Ordnance	Baseline Expendable Use	Baseline Expendable NEW (lb)
A-73	Small Arms – live	1,000,000	3,791.00
	Explosives	192	174.72
	Total	**1,000,192**	**3,965.72**
A-77	Bomb – inert	1,120	0.14
	Flare	31,596	23.44
	Gun – inert	288,376	577.76
	Gun – live	908,544	160,175.24
	Missile – live	8	9.10
	Small Arms – inert	63,444	53.29
	Small Arms – live	7,598,268	28,805.03
	Smoke	1,780	0.94
	Miscellaneous Expendables	159,068	10.02
	Total	**9,052,204**	**189,654.98**
A-78	Bomb – inert	224	0.03
	Flare	31,596	23.44
	Gun – inert	200,244	401.19
	Gun – live	909,036	160,282.65
	Missile – live	24	27.31

Table 2-4. Alternative 2: Summary of Expendables Used at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Test Area	Ordnance	Baseline Expendable Use	Baseline Expendable NEW (lb)
	Small Arms – live	5,676,760	21,520.60
	Small Arms – inert	15,860	13.32
	Smokes	788	0.42
	Miscellaneous Expendables	146,424	9.23
	Total	**6,980,956**	**182,278.19**
A-79	Bomb – live	16	2,457.60
	Miscellaneous Expendables	71,068	4.48
	Small Arms - live	1,775,370	6,730.43
	Total	**1,846,454**	**9,192.51**
B-7	Flare	13,378	9.93
	Gun – inert	129,860	260.17
	Gun – live	320,542	56,511.18
	Small Arms - live	4,950	18.76
	Miscellaneous Expendables	96,652	6.09
	Total	**565,382**	3,791.00
B-75	Bombs	4,112	1,935
	Smokes	1,000	0.53
	Flares	78,601	58.32
	Explosives	519,676	472,905.16
	Missiles	1,228	1,397.46
	Rockets	1,928	1.10
	Small Arms - live	16,710,123	63,348.08
	Miscellaneous Expendables	148	0.01
	Total	**17,316,816**	**537,711**
	Grand Total	**36,762,004**	**926,593**

Source: Data obtained from the selected alternative (Alternative 2) in the 2010 TA B-75 REA (U.S. Air Force, 2010b)
lb = pound(s); NEW = net explosive weight

During wartime, and at other times, a surge in mission activity is necessary in order to maintain operational readiness.

This alternative includes authorization of the proposed level of activity and performance of a comprehensive environmental analysis to ensure that TAs A-73, A-77, A-78, A-79, B-7, and B-75 can support this level of activity without suffering significant environmental impact. This is the Preferred Alternative, because it includes all mission activities that are expected to occur and provides capacity for a test or training surge. This alternative authorizes an expected maximum level of activity, which allows better responsiveness to the customer while ensuring that cumulative environmental effects do not cause significant impacts.

2.3 COMPARISON OF ALTERNATIVES

Potential impacts under each alternative are summarized below in Table 2-5.

Table 2-5. Summary of Potential Impacts Under All Alternatives

Resource	No Action	Alternative 1	Alternative 2
Chemical Materials	Debris from ground troop movement and munition fragments and residues would be generated as a result of testing and training missions. Debris should be managed in accordance with AAC Plans 32-5 and 32-9. Releases to the environment from munitions utilized in proficiency and qualification training require reporting to the USEPA under the EPCRA TRI program. Eglin AFB has developed procedures to comply with TRI reporting requirements and would track ordnance use associated with the proposed alternatives. Although the release of some chemicals would increase from the previously assessed baseline under the No Action Alternative, no new TRI thresholds would be exceeded and adverse effects are not anticipated. Transport, storage, use, and disposal of HM and waste should be coordinated with Eglin AFB's 96th Civil Engineer Group/Environmental Compliance Branch, Pollution Prevention Section.	Under Alternative 1, debris generation and the release of toxic chemicals would increase over the No Action Alternative. However, no new TRI thresholds would be exceeded and adverse impacts to the environment are not anticipated.	Under Alternative 2, debris and ordnance expenditures would increase substantially, and therefore the release of hazardous chemicals would increase. However, no new TRI thresholds would be exceeded and adverse impacts to the environment are not anticipated.
Soils	There would be no significant impacts to soils under the No Action Alternative. Metal concentrations in the soil generally would be below Eglin AFB background concentrations and would in all cases be below USEPA risk-based concentrations. Munitions training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential.	There would be no significant impacts to soils under Alternative 1. Increased munition expenditures would not result in metal concentrations in the soil exceeding USEPA risk-based concentrations. Munition training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential.	There would be no significant impacts to soils under Alternative 2. Increased munition expenditures would not result in metal concentrations in the soil exceeding USEPA risk-based concentrations. Increased munition training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential.
Water Resources	There would be no significant impacts to water resources with implementation of management practices under the No Action Alternative. Groundwater metal concentrations would not exceed USEPA risk-based thresholds. Surface water resources are located at distances from targets sufficient to minimize potential for contaminant transport, and sedimentation due to erosion would be controlled by management requirements. Wetlands would not be impacted, and no actions would modify the floodplain.	There would be no significant impacts to water resources under Alternative 1. Increased munition expenditures would not result in metal concentrations in groundwater exceeding USEPA risk-based concentrations. Surface water resources are located at distances from targets sufficient to minimize potential for contaminant transport, and sedimentation due to erosion	There would be no significant impacts to water resources under Alternative 2. Increased munition expenditures would not result in metal concentrations in groundwater exceeding USEPA risk-based concentrations. Surface water resources are located at distances from targets sufficient to minimize potential for contaminant transport, and sedimentation due to erosion

Table 2-5. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	No Action	Alternative 1	Alternative 2
		would be controlled by management requirements. Wetlands would not be impacted, and no actions would modify the floodplain.	would be controlled by management requirements. Wetlands would not be impacted, and no actions would modify the floodplain.
Biological Resources	Potential impacts under the No Action Alternative are identical to those associated with the Preferred Alternative of the 2010 TA B-75 REA and the 2004 *Air-to-Ground Gunnery PEA*. Wildlife, including sensitive animal species, potentially could be struck by ordnance, troops, vehicles, or other equipment. However, the frequency would not be great enough to cause population-level effects. Ground activities typically are conducted on roads, and troop movement through interstitial areas in of low frequency and intensity. Ground-disturbing activities would be restricted in sensitive habitats, and Eglin Natural Resources Section personnel would conduct site surveys as necessary. Noise would cause behavioral responses in wildlife, including sensitive bird and mammal species, such as startle reaction, flushing, and temporary area avoidance. Noise impacts to the RCW are of primary concern. In general, RCWs would likely exhibit similar reactions, but individuals as well as the overall population on Eglin AFB are evidently tolerant to noise to some degree. Nesting has continued in close proximity to the test areas, and the population has increased. Eglin Natural Resources would evaluate activities on a case-by-case basis and determine the possibility for individuals to be unacceptably harassed. The probability of burrowing owl or gopher tortoise burrow collapse due to munition, troop, or vehicle impact is considered low. Similarly, the likelihood of direct physical strike of sensitive wildlife species such as the eastern indigo snake and gopher frog is considered remote. Wildfire caused by military activities has the potential to move off the test area boundaries and damage or destroy RCW trees or individual birds. However, implementation of management requirements would reduce this potential	Under Alternative 1, ground activities, small arms fire, and activities involving small charges would increase. Troop and vehicle movement would usually occur on established roads, and movement through interstitial areas would be relatively infrequent. The frequency and cumulative level of noise would increase, but impacts would not be significant.	Surges in test and training activities could result in an increased number of direct strikes to wildlife species, but the probability would be low and significant effects would be unlikely. Wildlife species, including the RCW, could be exposed to noise more frequently, resulting in increased incidences of behavioral reactions. However, RCWs are evidently acclimated to noise at least to some degree, and negative effects to the overall population on Eglin AFB are not expected. Population monitoring would continue and Eglin Natural Resources Section would evaluate specific activities for possible repetitive impacts to individual RCWs. Ground movement would not cause significant impacts. Burrow collapse would not be frequent under Alternative 2. However, increased wildfire potential could adversely impact sensitive plant communities, including RCW cavity trees. Nighttime fires could also directly impact roosting RCWs. Eglin Natural Resources would consult with USFWS for RCW impacts related to wildfire. Protection measures would benefit other wildlife species as well. Management requirements would be implemented for all alternatives.

Table 2-5. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	No Action	Alternative 1	Alternative 2
	so that adverse effects are not likely. These requirements would provide protection for other wildlife species and habitats as well.		
Cultural	No adverse effects to cultural resources would be expected under any of the alternatives with implementation of the following policies and procedures put forth in the Eglin AFB ICRMP and EAFBI 13-212. Sites potentially eligible for listing in the National Register occur at A-79 and B-75; these sites must be avoided. If avoidance of these resources is not possible, additional consultation with 96 CEG/CEVSH would be required in conjunction with additional testing, data recovery, or other forms of mitigation as necessary. Ground-disturbing activities must be avoided at Metts Cemetery outside B-75. Consultation with 96 CEG/CEVSH is required to obtain the latest information on known and unknown cultural resources before undertaking any ground-disturbing activities at any of the test areas.		
Air Quality	There would be no adverse impacts to air quality due to pollutant or GHG emissions at either a county or regional level.		
Noise	There would be no significant adverse impacts due to aircraft or ground-based noise. Noise levels associated with human annoyance would extend into off-base communities, but noise levels considered to cause physiological damage would not. Certain test or training events should not be conducted in weather conditions that exacerbate noise effects.	There would be no significant adverse impacts associated with noise due to the addition of small arms fire and small explosive use. The additional noise would not exceed annoyance thresholds beyond the Eglin AFB boundary.	The increase in munition expenditure would cause increased occurrences of noise, including noise levels associated with human annoyance. However, noise levels associated with physiological damage would not extend off base. No significant adverse impacts from noise are expected.
Safety and Restricted Access	Since the types of munitions to be used are the same or similar to the types currently used at A&GG test areas, implementation of the No Action Alternative, Alternative 1, or Alternative 2 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. In the case of the proposed 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. Most areas on the Eglin Range, including A&GG test areas, have the potential for UXO contamination. Consultation and coordination with 96 CES/CED would mitigate any potential adverse impacts to Eglin AFB personnel from UXO. Although increases in the frequency of ordnance use would likely lead to increased instances of UXO, the current safety policies and procedures would continue to insure that there would be no adverse impacts from UXO.		
Land Use	There would be no changes to land use designation, so there would be no impacts to land use. Under the No Action Alternative, there would be potential for minor and temporary impacts to recreational resources from the possible closures of recreational areas during certain testing and training missions.	There would be no changes to land use designation, so there would be no impacts to land use. There would be an increase in the potential for closures to recreational areas. However, closures would occur only for the duration of the activity and other areas would remain open for recreational areas. Therefore, impacts to recreational resources are anticipated to be minor and temporary.	
Socioeconomics	No significant impacts to the public were anticipated from the level of activity approved in the 2004 *Air-to-Ground Gunnery PEA* or 2010 TA B-75 PEA; therefore, no significant impacts are	Under Alternative 1, there is a potential for more frequent noise impacts; however, noise levels of concern would not extend beyond the Eglin AFB	Under Alternative 2, more frequent activities would increase the area exposed to 62 dB L_{Cdn} noise levels. Therefore, a larger residential

Table 2-5. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	No Action	Alternative 1	Alternative 2
	anticipated under the No Action Alternative. Although noise levels associated with human annoyance (62 dB L_{Cdn}) would extend off the Eglin AFB boundary into residential areas, including some areas with environmental justice concerns, sound levels that generally would cause complaints or result in adverse health effects would not be reached. None of the noise complaints regarding Eglin AFB activities in 2011 were associated with the affected test areas. The effects of weather conditions on noise propagation should be evaluated during planning.	boundary. Impacts are anticipated to be minor and temporary lasting only for the duration of the activity. Weather conditions should be evaluated during planning.	could be affected, including areas with environmental justice concerns. Sound levels that generally would cause complaints or result in adverse health effects would not be reached. Evaluation of weather conditions could decrease the potential for annoyance.

96 CES/CED = 96th Civil Engineering Squadron Explosive Ordnance Disposal Flight; 96 CEG/CEVSH = 96th Civil Engineer Group/Cultural Resources Branch; AAC = Air Armament Center; AFB = Air Force Base; A&GG = Air and Ground Gunnery; dB = decibel; EOD =Explosive Ordnance Disposal; EPCRA = Emergency Planning and Community Right-to-Know Act; GHG = greenhouse gas; ICRMP = Integrated Cultural Resources Management Plan; L_{Cdn} = C-weighted day/night noise level; National Register = National Register of Historic Places; PEA = Programmatic Environmental Assessment; RCW = red-cockaded woodpecker; SDZ = surface danger zone; TRI = Toxics Release Inventory; USEPA = U.S. Environmental Protection Agency

2.4 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 2, which includes the incorporation of additional expenditures and activities described under Alternative 1, with the addition of activity and expenditure surge capability. Implementation of management actions will allow a surge in test and training activities while minimizing impacts to environmental, natural, and cultural resources. The No Action Alternative and Alternative 1 are not expected to be sufficient to account for the expected changes in testing and training activities at Eglin AFB over the next 10 years. Therefore, Alternative 2 was selected as the Preferred Alternative to cover adequately the environmental analysis needed to support potential alternative or increased testing and training requirements as they occur. The preferred alternative recognizes that Eglin AFB historically has experienced activity surges that do not last. The need to maintain a large safety buffer for the exceptional activities has had an overall positive effect in maintaining large undeveloped safety buffer areas of natural environment.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 CHEMICAL MATERIALS

Chemical materials encompass liquid, solid, or gaseous substances that are released to the environment from mission activities. These materials would include munitions and pyrotechnic combustion by-products from items such as smokes and flares. Release of these materials potentially may affect air quality, water quality, soils, and sediments.

3.1.1 Affected Environment

The environmental analysis of chemical materials describes the potentially adverse environmental impacts from testing and training activities within TAs A-73, A-77, A-78, A-79, B-7, and B-75. The Chemical Materials section includes hazardous materials (HM) and debris discussion and analysis.

Hazardous Materials

According to the Resource Conservation and Recovery Act (RCRA), 42 United States Code [USC] Section 6903(5), HM and waste are defined as substances that, because of "quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to increases in mortality or serious illnesses, or pose a substantial threat to human health or the environment."

HM, 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 AFI 32-7042. The HM to be transported, stored, and used on-site for the Proposed Action consist of fuels, munitions, and pyrotechnics.

Eglin AFB has implemented a *Hazardous Waste Management Plan*, EAFBI 32-7003, that identifies hazardous waste (HW) generation areas and addresses the proper packaging, labeling, storage, and handling of HWs. The plan also addresses record keeping; spill contingency and response requirements; and education and training of appropriate personnel in the hazards, safe handling, and transportation of these materials (U.S. Air Force, 2010c).

Specific procedures and responsibilities for responding to an HW spill or other incident are also described in the Eglin AFB *Spill Prevention, Control, and Countermeasures (SPCC) Plan* (U.S. Air Force, 2011b).

Releases to the environment from munitions utilized in proficiency and qualification training require reporting to the U.S. Environmental Protection Agency (USEPA) under the Emergency Planning and Community Right-to-Know (EPCRA) Toxics 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 when a threshold is exceeded, the installation must report on a "Form R" report to the USEPA the quantity of munition-related waste released to the environment or recovered and recycled.

Eglin AFB has procedures to comply with TRI reporting requirements and would track ordnance use associated with the proposed alternatives. This could require new procedures if proposed training activities would result in reporting thresholds being exceeded at the base for any new chemicals.

Regulations

Under federal law, the transportation of HM is regulated in accordance with the Transportation of Hazardous Material, 49 United State Code (USC) 5101 et seq. (formerly 49 App. USC 1801 et seq.). For the transportation of HM, Florida has adopted federal regulations that implement the Hazardous Materials Transportation Act, found at 49 CFR 178.

State laws pertaining to HM management include the Florida Right-to-Know Act, Florida Statutes Title 17, Chapter 252, and annotated Title 29, Section 403.721, which authorizes the Hazardous Waste Section of the FDEP and the Florida Department of Transportation Motor Carrier Compliance Department to implement 49 CFR 178.

AFI 32-7086 Supplement 1, *Hazardous Materials Management*, describes how Eglin AFB complies with federal, state, Air Force, and DoD laws and instructions. All Eglin AFB organizations and tenants are required to follow this plan.

Debris

Debris includes the physical materials that are deposited on the surface of terrestrial or aquatic environments during mission activities. The potential impacts are related to primarily physical disturbances to people, wildlife, or other users of the Range, and chemical alterations that could result from the residual materials. Examples of debris deposited from activities in TAs A-73, A-77, A-78, A-79, B-7, and B-75 that may potentially result in environmental impacts include the following:

- Shell casings, canisters from signal smokes, flares, and chutes from flares.
- UXO (primarily inert items).
- Litter and refuse from daily mission activities, including ground troop movement.

3.1.2 Environmental Consequences

The potential environmental impact of HM and waste were assessed as they pertain to debris from ground troop movement and chemical materials from ordnance for testing and training activities within the subject test areas. Additionally, the transport, storage, use, and disposal of HM and waste associated with activities within TA A-73, A-77, A-78, A-79, B-7, and B-75

should be coordinated with Eglin AFB's 96th Civil Engineer Group/Environmental Compliance Branch, Pollution Prevention Section and disposed of appropriately according to regulations and Air Armament Center (AAC) Plan 32-5, *Hazardous Waste Management Plan*. AAC Plan 32-9, *Hazardous Materials Management*, describes how Eglin AFB complies with federal, state, Air Force, and DoD laws and instructions. 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, HM, or HW would be reported in accordance with EAFBI 32-7003.

Eglin AFB has developed emergency response procedures and site-specific contingency plans for all HM locations. Procedures and responsibilities for responding to a HM spill or other incidents are described in the Hazardous Waste Management Plan (U.S. Air Force, 2010c) and the Eglin AFB SPCC Plan (U.S. Air Force, 2011b).

3.1.2.1 No Action Alternative

Debris

Debris, such as 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 test and training activities. If these items are left in place and not properly disposed, packed out, or periodically cleared, the debris and refuse has the potential to cause adverse environmental impacts. AAC Plan 32-5 and AAC Plan 32-9 should be adhered to during training activities for recycling, HM management, and proper disposal of wastes.

Ordnance Use

HM/solid wastes, as they pertain to the analysis in this section, are the explosives and metals associated with the expenditure of ordnance on TA A-73, A-77, A-78, A-79, B-7, and B-75. These materials may degrade the quality of soil or water or may be toxic to plants, wildlife, or people. For the mission activities occurring on TA A-73, A-77, A-78, A-79, B-7, and B-75, metals and explosives from bombs, missiles, guns, mines, small arms, smokes, chaff, and flares are the primary chemical materials of concern. On the subject TAs, munitions and pyrotechnics use has increased since the previous baseline and, in some cases, has exceeded the levels authorized in the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 Final Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 2004). Under current practice, munition debris is recovered and/or removed from the ranges for storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFI 13-212, which requires the range to be cleared of munitions debris on a regular basis.

Toxics Release Inventory-Data Delivery System

Quantification of chemical constituents in ordnance was determined using the TRI-Data Delivery System (TRI-DDS) (DoD, 2012). The TRI-DDS is a tool that is a product of the EPCRA Workgroup and is intended to provide a consistent method to assess chemical release and waste

management data across the DoD. The EPCRA Workgroup supplies information for the DoD EPCRA TRI reporting database for munition and range activities.

The TRI-DDS draws on both constituent information and emission factor data to determine the quantities of chemicals released from demilitarization (e.g., open-burn/open-detonation), live fire, and training activities. Calculations in the TRI-DDS begin with identifying and selecting or entering the specific munition item used. Munition items are identified in the TRI-DDS by DoD Identification Code, Navy Ammunition Logistics Code, National Stock Number, or common name-pick lists. The resulting TRI-DDS report lists the chemical constituents that compose each munition item. These quantities are used to determine quantities of chemicals emitted. Because it is assumed that all munition debris, inert, and dudded munitions will be removed from the range annually, this analysis addresses air emissions only from inert munitions and blanks. It is assumed that emissions to the air from detonation will not only enter the air environment but will also have the potential to settle back onto the soil and possibly be transported by water.

Expenditures

TRI-DDS analysis included the chemical constituents in bombs, missiles, guns, small arms, smokes, explosives, and flares used for testing and training within TAs A-73, A-77, A-78, A-79, B-7, and B-75. Numerous types of munitions are used on these TAs; however, for the purposes of analysis, the items listed in the following table were used as surrogates, in some cases as representatives where constituent data were not available. Ordnance expenditures listed were provided by user groups, and maximum annual expendables for TA A-73, A-77, A-78, A-79, B-7, and B-75 under the No Action Alternative are detailed in Chapter 2, Section 2.2.1. (Note: Potential impacts from chemical releases to specific media [i.e., soil, water, air, biological resources] are discussed in each of those respective sections.)

The DoD's TRI-DDS website was used to determine constituent chemical emissions from the discharge of these representative munitions on TA A-73, A-77, A-78, A-79, B-7, and B-75. Expenditures were analyzed on an annual basis. Although 33 toxic chemical constituents are listed in the output of the various munitions, only those totaling greater than or equal to 1 pound annually are listed here, in Table 3-1. This includes the six insoluble chemicals that would be the most persistent in the environment. Training is subject to a reporting threshold of 10,000 pounds per year for most common chemicals, with lower reporting thresholds for chemicals classified as persistent bioaccumulative toxic. Included in this list are lead and lead compounds with a threshold of 100 pounds (USEPA, 2012a).

No new TRI reporting thresholds would be exceeded by munitions expenditures associated with the No Action Alternative.

Table 3-1. Munition-Related Residue Under No Action Alternative

Chemical	Quantity Released on TA (lbs)			
	A-77	A-78	B-7	B-75
1,3-butadiene				3.02
Acetaldehyde				2.60
Antimony compounds	37.66	28.63	7.51	100.09
Barium compounds	58.83	44.72	11.73	156.37
Carbon tetrachloride				1.26
Chlorine	3.86	2.88		16.96
Chromium (III) compounds				4.88
Cyanide compounds	2.92	2.28	1.47	
Ethylene				5.03
Formaldehyde				2.60
Hexachloroethane				1.93
Hydrazine				6.57
Hydrochloric acid	117.48	83.93		502.58
Hydrogen cyanide				2.60
Lead compounds	36.71	27.51	17.79	
* Lead compounds	10.64	7.95		46.79
n-Hexane	1.30			5.74
Nitric acid				6.25
Ozone				2.60
Propylene (Propene)				2.60
Tetrachloroethylene (perchloroethylene)				1.36
Toluene	1.64	1.28		

Source: DoD, 2012

* Lead compounds are based on AP-42 Emission Factors; the other lead compounds listed in the table are based on mass balance.

3.1.2.2 Alternative 1

Debris

Under Alternative 1, training activities occurring at TAs A-73, A-77, A-78, A-79, B-7, and B-75 would increase significantly over the currently approved levels under the No Action Alternative. Additional Army ground operations and a change in the air platform used by AFSOC operations would occur on TA A-77 and A-78. These changes would be within currently approved operations and would be similar in scope and size of operations already occurring. TA A-73 is anticipated to be used for small arms test and training and breach wall activities which would add live small arms fire and light explosives to this TA. The small arms expenditures would be sequestered in the bullet trap thus minimizing impacts to soil or water resources. Management practices are in place that assure training areas will be scanned for live ordnance, debris and dudded munitions, and that they would be removed. Dudded munitions or UXO would be flagged and scheduled for removal according to standard procedures. Therefore, no impacts are expected due to debris associated with the training activities under Alternative 1.

Ordnance Use

Ordnance use would increase under Alternative 1. Ordnance expenditures were provided by user groups, and maximum annual expendables for TAs A-73, A-77, A-78, A-79, B-7, and B-75

under Alternatives 1 is detailed in Chapter 2 (Table 3-2). (Note: Potential impacts from chemical releases to specific media [i.e., soil, water, air, biological resources] are discussed in each of those respective sections.)

The same methodology was used to determine the chemical emissions associated with ordnance expenditure as a result of testing and training on the subject test areas. Table 3-2 shows that the chemical output under Alternative 1 would be slightly higher than under the No Action Alternative, and the addition of munition expenditures on A-73. No new TRI thresholds would be exceeded under Alternative 1.

Table 3-2. Munition-Related Residue Under Alternative 1

Chemicals	Quantity Released on TA (lbs)					
	A-73	A-77	A-78	A-79	B-7	B-75
1,3-butadiene						3.02
Acetaldehyde						2.60
Antimony compounds	3.00	50.53	44.79	5.32	9.80	100.09
Barium compounds	4.68	78.94	69.97	8.31	15.31	156.37
Benzene		1.08	1.08			
Carbon tetrachloride						1.26
Chlorine		3.86	2.88			16.96
Chromium (III) compounds						4.88
Cyanide compounds		5.45	5.45		1.92	
Ethylene						5.03
Formaldehyde						2.60
Hexachloroethane						1.93
Hydrazine		1.81	1.81			6.57
Hydrochloric acid	14.79	118.06	86.46	26.25		502.58
Hydrogen cyanide						2.60
Lead compounds		57.08	53.09		21.42	0.00
* Lead compounds	1.40	10.64	7.95	2.49		46.79
n-Hexane		1.30				5.74
Nitric acid						6.25
Ozone						2.60
Propylene (Propene)						2.60
Sulfuric acid		1.13	1.13			0.00
Tetrachloroethylene (Perchloroethylene)						1.36
Toluene		3.06	3.07		1.08	

Source: DoD, 2012
DoD = Department of Defense; lb = pound(s); TA = test area
* Lead compounds are based on AP-42 Emission Factors; the other lead compounds listed in the table are based on mass balance.

3.1.2.3 Alternative 2

Debris

Under Alternative 2, testing and training activities occurring at TA A-73, A-77, A-78, A-79, B-7, and B-75 would increase to allow for surge test and training activities over the levels analyzed under Alternative 1. However, management practices would remain in place that assure training

areas will be scanned for debris and dudded munitions, and that they would be removed. Any dudded munitions or UXO would be flagged and removed according to standard procedures.

Therefore, no impacts are expected due to debris associated with the training activities under Alternative 2.

Ordnance Use

Under Alternative 2, ordnance use would increase a great deal from the levels analyzed in Alternative 1. Ordnance expenditures were provided by user groups, and maximum annual expendables for TAs A-73, A-77, A-78, A-79, B-7, and B-75 under Alternative 2 are detailed in Chapter 2 (Table 3-3). (Note: Potential impacts from chemical releases to specific media [i.e., soil, water, air,] are discussed in each of those respective sections.)

Table 3-3. Munition-Related Residue Under Alternative 2

Chemicals	Quantity Released on TA (lbs)					
	A-73	A-77	A-78	A-79	B-7	B-75
1,3-butadiene		1.37	1.03			3.02
Acetaldehyde		1.81	1.81			2.60
Ammonia		1.81	1.81			
Antimony compounds	5.99	102.07	89.57	10.63	19.59	100.09
Barium compounds	9.36	157.87	139.94	16.61	30.61	156.37
Benzene		2.16	2.16			
Carbon tetrachloride						1.26
Chlorine	1.02	7.71	5.76	1.80		16.96
Chromium (III) compounds		1.96	1.96			4.88
Cyanide compounds		10.89	10.90		3.84	
Ethylene		2.91	1.81			5.03
Formaldehyde		1.81	1.81			2.60
Hexachloroethane						1.93
Hydrazine		3.62	3.63		1.28	6.57
Hydrochloric acid	29.57	236.12	172.93	52.50		502.58
Hydrogen cyanide		1.81	1.81			2.60
Lead compounds		114.16	106.19		42.84	
* Lead compounds	2.80	21.28	15.89	4.97		46.79
n-Hexane		4.34	3.68			5.74
Nitric acid		1.82	1.82			6.25
Ozone		1.81	1.81			2.60
Propylene (Propene)		1.81	1.81			2.60
Sulfuric acid		2.27	2.27			
Tetrachloroethylene (Perchloroethylene)						1.36
Toluene		6.13	6.13		2.16	

Source: DoD, 2012
lb = pound(s); TA = test area
* Lead compounds are based on AP-42 Emission Factors; the other lead compounds listed in the table are based on mass balance.

The same methodology was used to determine the chemical emissions associated with ordnance expenditure as a result of training and testing at the subject test and training areas. Chemical emissions under Alternative 2 are shown in Table 3-3. Increases are approximately double over

Alternative 1. Of particular note is the lead compounds that exceed the 100-pound threshold. The chemical load from all munitions would be distributed over TAs A-77, A-78, and B-7, each of which are approximately 360 acres; thus, the overall concentration of any chemical at any given location would be insignificant. Additionally, lead expenditures on Eglin AFB already require TRI reporting; thus, no new TRI thresholds would be exceeded for Alternative 2.

3.2 SOILS

3.2.1 Affected Environment

Soil Types

This section describes the soil types found on TAs A-73, A-77, A-78, A-79, B-7, and B-75. The primary soil type is the Lakeland Sand soil series, which has moderate to high potential for erosion caused by stormwater runoff and military operations; therefore, it raises concern for potential impacts to the affected environment. Small fractions of six additional soil types include: Chipley and Hurricane (found on B-75), Foxworth Sand (A-78), Bonifay Loamy Sand (A-79), and Pactolus Loamy Sand (TA A-79). Percentage of each soil type is summarized for each TA in Table 3-4. Table 3-5 briefly describes important soil type characteristics relevant to analyze the issues of concern. Descriptions of soil types can be found in Appendix E, *Soil Type Descriptions.*

Table 3-4. Soil Type Percentages for Training and Test Areas

TA	Training and Test Area Acreage	% Lakeland	% Chipley and Hurricane	% Foxworth	% Rutledge Sand	% Troupe Loamy Sand	% Pactolus	% Bonifay
A-73	592.81	100	--	--	--	--	--	--
A-77	387.20	100	--	--	--	--	--	--
A-78	404.36	99	--	--	--	1	--	--
A-79	805.76	75	--	--	9	6	5	1
B-7	316.68	100	--	--	--	--	--	--
B-75	3,491	98	1	1	--	--	--	--

Table 3-5. Soil Type Characteristics

Soil Name	Erosion Risk	Attributes	Soil Type
Lakeland Sand	Moderate to high	Yellowish brown to grayish brown	Sandy
Chipley and Hurricane	High	Marine sediments, yellow, brown, or gray	Sandy
Foxworth Sand	Moderate	Marine or eolian sediments, very dark brown	Sandy
Rutledge Loamy Sand	Low	Ponding, very acidic, clayey	Loamy sand
Troup Loamy Sand	Low to moderate	Marine unconsolidated sediments, brown	Loamy sand
Pactolus Loamy Sand	Low	Thick, deep soils, very acidic	Loamy sand
Bonifay Loamy Sand	Low	Very acidic, ironstone pebbles	Loamy sand

Source: Overing et al., 1995)

3.2.2 Environmental Consequences

Testing and training activities on the test areas may affect soils by deposition of munitions residue, and erosion. Potential munition impacts to soils pertain to metals and chemical substances in mission debris which can absorb into the soil, release into and impact groundwater and surface waters. Also, the munitions used, including bombs, small arms expenditures, and their associated ordnance retrieval, may initiate or accelerate erosion in sloped areas of the test areas with reduced vegetative cover. According to the Operation Range Assessment Plan (ORAP, http://www.afcee.af.mil/resources/ranges/sustainment/index.asp), "range clearance activities do not focus on the removal of munitions-related constituents, however, AFCEE/TD is capable of providing and managing contractors to detect, remove, demilitarize, recycle and/or dispose of range residue." Under current practices, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices comply with AFI 13-212 and require the range to be cleared of munitions debris on a regular basis. The BMPs listed in Section 5.2 can substantially decrease potential impacts to soils. Soil types of the training and testing areas are depicted in Figure 3-1.

3.2.2.1 No Action Alternative

Munitions Residue

Degradation of ordnance materials may produce concentrations of metal (chemical substances) that are absorbed into the soils, and, subsequently migrate downward to groundwater and/or horizontally to surface waters. Munitions metal and organic by-products may potentially deposit on the ground's surface following the execution of mission activities. Some occur naturally in the environment (i.e., copper, lead, zinc) and are important to overall ecosystem function. However, lead, for example, is a component of explosives that may accumulate in soil and is not easily destroyed. High concentrations can be toxic to plants and animals. The immobilization of deposited metals on the test areas can prevent leaching into groundwater systems by mechanisms of adsorption (onto soil particles) and precipitation of metal oxides. But when metals are immobilized in surface soils by specific soil conditions, they are more readily transported to receiving waterways by soil erosion.

The *Test Area (TA) B-75 Final Programmatic Environmental Assessment (EA)* (U.S. Air Force, 2000) identified small arms training as the mission category that could result in the greatest deposition of chemical materials (specifically lead and copper) into the soil. Estimated concentrations of lead and copper from a target berm study were used to predict potential soil impacts by munitions residue in the 2010 B-75 Final PEA. Lead and copper are constituents of M80 ammunition and the brass cartridge cases of the 7.62-mm round. The analysis used the highest baseline expendable number (16,710,123 on TA B-75) to calculate the highest concentrations of lead and copper on B-75. The expenditure on the other test areas (Table 2-1, Table 2-2, and Table 2-3) are a fraction of operation levels on B-75.

Munitions residue may immobilize in the soil and accumulate over time; therefore, USEPA risk-based criteria (RBCs) were used to compare metal concentrations measured from target berms on B-75 to Eglin AFB's background metal levels. The RBCs are used for screening chemicals during risk assessments. Risk is defined as the expected frequency or probability of undesirable effects resulting from exposure to chemical stressors that could induce an adverse

response in biological receptors. The conclusions drawn from this analysis will be used to predict the potential of munitions residue impact to soils of the other training and test areas because 1) B-75 has the greatest amount of gunfire activity among the affected ranges, creating a worst-case scenario, and 2) the Lakeland Sand series dominates B-75 and is common to all training and test areas where target training is conducted.

To determine if lead and other contaminants were present in B-75 soils around the targets, soils from five representative berms were tested for metals and other soil parameters. Results showed that the concentrations of copper, iron, zinc, aluminum, chromium, and lead were generally well below the Eglin AFB background and USEPA risk-based concentrations, with no exceedances identified (Table 3-6). The highest surface and subsurface soil concentrations for copper and lead were detected at the B-5 target site on Holley Creek.

Table 3-6. Metal Concentrations in Soils from TA B-75 Target Berms, 2000 (mg/kg)

Soil Stratum	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 AFB Soil Background Concentrations						
Surface (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)
Subsurface (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)
USEPA Region III Noncarcinogenic Effect Risk-Based Soil Residential Use Concentrations						
	3,100	23,000	23,000	78,000	120,000	400

Sources: U.S. Air Force, 2000; USEPA, 2003
AFB = Air Force Base; mg/kg = milligrams per kilogram; USEPA = U.S. Environmental Protection Agency

The 2000 B-75 PEA cited that 5,072 pounds of copper per berm and 8,902 pounds of lead per berm were deposited in soils from firing 3,445,864 rounds of 7.62-mm M80. This amount of expenditure yielded concentrations of 3.2 milligrams per kilogram (mg/kg) copper and 9.9 mg/kg lead in the target berm soil. The No Action Alternative, Alternative 1, and Alternative 2 proposed level of small arms fire on B-75 is 16,710,123 rounds, or 5.02 times greater than the 3,445,864 rounds that the original study was based on. Therefore, multiplying (3.2 mg/kg) and (9.9 mg/kg) by 5.02 increases the predicted concentrations to 16.06 mg/kg (copper) and 49.6 mg/kg (lead), respectively. This would be the highest predicted concentration of copper or lead that may concentrate at any given target berm at any of the small arms training areas. These elevated concentrations may exceed the average Eglin AFB background levels (copper = 4.42 mg/kg and lead = 19.82 mg/kg) but are not outside the background ranges values (0.15-90 mg/kg, and 0.78-340, respectively). Neither concentration exceeds USEPA Region III RBCs for copper or lead in residential soils (Table 3-6).

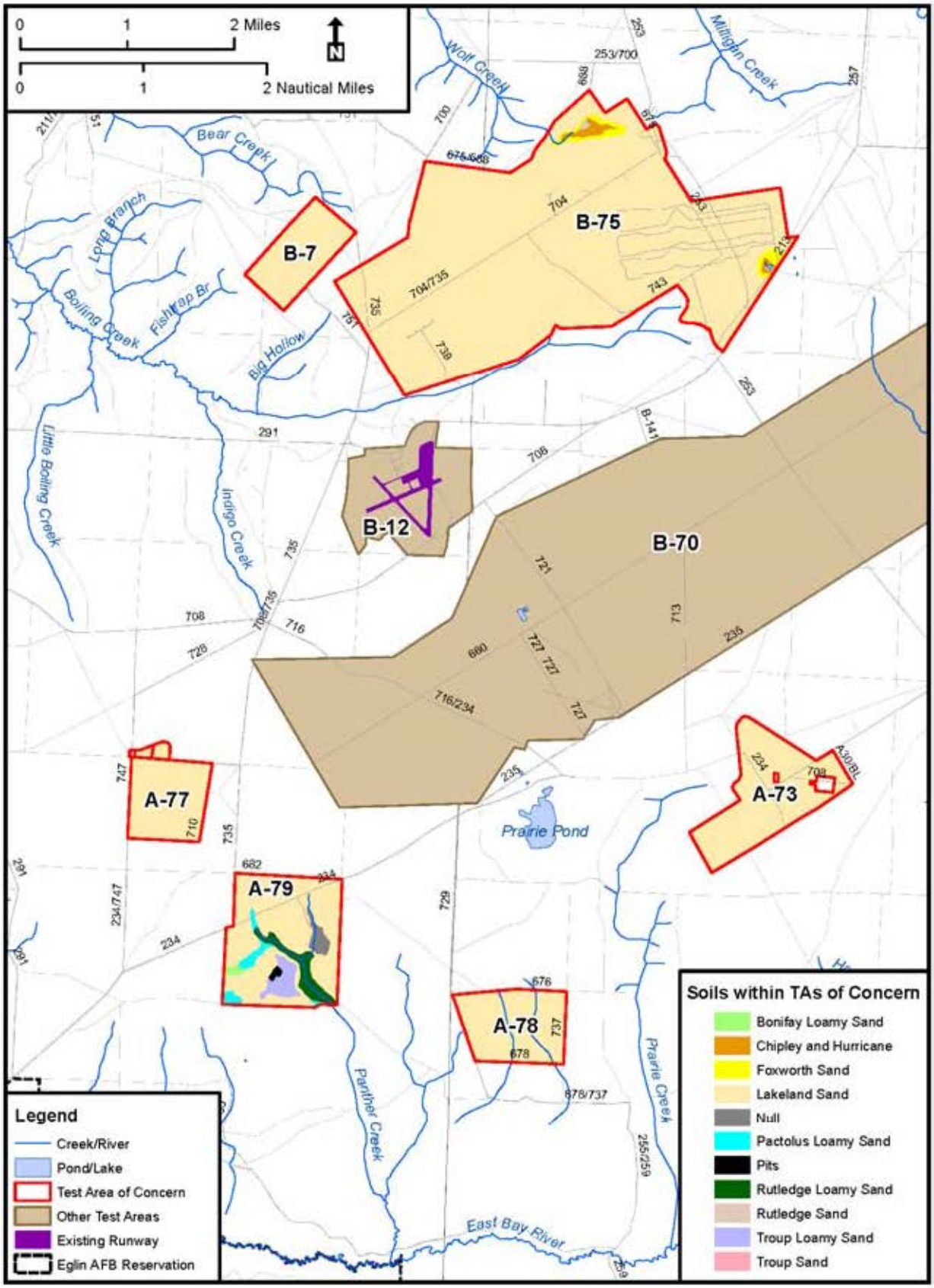

Figure 3-1. Soil Types of the Training and Testing Areas

The high usage of the berm target sites at test areas, coupled with the relatively low concentrations of lead and copper in the soil samples, suggests that either the metals may become soluble in soil and migrate downward, or they are locked up in target berms as intact slugs. Lead and copper are generally stable in the environment, but under certain soil and climate conditions they can break down and become soluble in the soil. Once soluble, they become mobile and can be transported to groundwater. The availability of lead and copper is partly dependent on their rate of degradation in the soil. The rate of degradation, which is regulated primarily by soil chemistry and climate, ranges from a few years to hundreds of years.

Based on the soil analysis provided in the 2000 B-75 Final PEA, copper and lead from small arms ammunition projectiles could degrade over time on B-75 (or any of the test areas), leach into the surficial aquifer system, and flow laterally along groundwater gradients towards nearby surface water streams. The very strongly acidic soils (such as the Rutledge Loamy Soil on TA A-79) could promote corrosion and oxidative weathering of metal surfaces, thereby increasing copper and lead solubility in the soil and are less likely to bind to soil particles because of the low action exchange capacity of the Lakeland Sands soil. Dissolved metals potentially could move toward groundwater. But, the Eglin Installation Restoration Program (IRP, now Environmental Restoration Program [ERP]) has determined that lead generally exhibits limited vertical migration when deposited in Eglin AFB soil (U.S. Air Force, 2000). Based on ERP data, it was theorized that lead degrades slowly in the Eglin AFB soil environment and generally does not manifest in the soil or groundwater, particularly with increased distance from the point of origin.

The ejected brass cartridge case of ammunition was considered for residue analysis because it is composed of 70 percent copper and 30 percent zinc. The 7.62-mm round encapsulates the propellant charge and supports the bullet projectile. Projectile cartridge types include ball bullets, tracers, and incendiary bullets. The bullet projectile consists of two parts: a copper alloy clad steel metal jacket and a lead alloy core. The core of the ball is composed of a short steel forward section and a larger lead/antimony rear section. The metal jacket around the core is normally composed of brass (copper and zinc) or a ductile grade of malleable steel covered with a thin coating of copper. Copper and zinc in the bullet casings were not considered for potential impact because the cases are removed from sites after missions are completed.

Ground test bomb detonations and EOD operations were similarly analyzed in the 2000 B-75 Final PEA for residual metal constituents. The types of ordnance expended during EOD operations included live and inert bombs, C4, demolition charges, Shallow Water Assault Breaching charges, detonation cord, mines, fuses, igniters, and ground burst simulators. Aluminum, barium, and copper were found to be the primary constituents of concern. Estimated cumulative concentrations over a 3-year period at Training Target (TT) 18 on TA B-75 were determined to be less than typical background concentrations for the soils on Eglin AFB and USEPA risk-based concentrations (Table 3-7). Munitions residue from these type ordnances under the No Action Alternative is not expected to impact soils on TAs A-75, and A-77, A-78, A-79, B-7 as long as BMPs are implemented.

Table 3-7. Estimated Concentration of By-Products on TT-18 During FY 1995–1997

Element	Total Soil Surface Deposition (lb)	Total Soil Concentration (mg/kg)	USEPA Region III Risk-Based Concentrations (mg/kg)	Phytotoxicity Thresholds (mg/kg)[1]
Aluminum	182	2.7	78,000	10
Barium	5	0.1	5,500	500
Copper	37	0.6	3,100	40

Source: U.S. Air Force, 2000
FY = fiscal year; kg = kilogram; lb = pound(s); mg = milligram; TT = Training Target
1. Bioavailable concentration that resulted in a 20 percent reduction in plant growth or yield.

Soil Erosion

Soil erosion is the process of detachment, suspension, translocation, and deposition of surface materials by water, wind, ice, or gravity. The rate of erosion in a given area can be accelerated by human activities. Erosion can introduce sediments and pollutants into terrestrial and aquatic environments, damage or destroy cultural resources, reduce recreation use and value of affected watersheds, and increase land management and operating costs. Eroded soil particles moved and deposited by a watercourse, which are known as 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, burial of benthic organism aquatic habitats, and alteration of stream hydrology. Sediment deposition on other terrestrial systems can bury and kill vegetation and other organisms. Erosion and sedimentation can also introduce organic matter and nutrients, pesticides, metals, and other compounds into receiving ecosystems.

AFI 32-7041, Water Quality Compliance stipulates that the Air Force maintain compliance with the Clean Water Act (CWA) and other federal, local, and state environmental and water quality directives. Sedimentation to nearby streams and surface waters is considered non-point source pollution, so erosion potential was analyzed in previous programmatic EAs and BMPs implemented on the test areas to reduce and mitigate impacts of erosion. The modeling for the analysis is described in the 2010 B-75 PEA and 2004 A&GG PEA. The erosion potential is similar between test areas because of the shared physical characteristics of the soils and terrain, and the training operations conducted at each. Figure 3-2 illustrates pro-active placement of military training targets upland of the general flow of groundwater (which is indicative of sloped areas or downward contours).

The major activities that could contribute to erosion on the training and test areas include air-to-surface bomb delivery training, air-to-surface gunnery operations, and surface-to-surface small arms training. In addition to soil disturbance caused by the munitions, erosion could also result from vehicle and foot traffic associated with ordnance retrieval and ground training activities. Air-to-surface gunnery operations fired from helicopters are expected to increase potential for erosion in HLZs. Previous levels of activity on the ranges have contributed to increased erosion at the training sites. The slopes adjacent to the target ranges are relatively sparsely vegetated due to mechanical vegetation control practices. Localized soil

erosion would be deposited primarily on interslope terraces and in the receiving drains and depressions of the basin areas. Increased soil deposition could also bury vegetation, which could further reduce the overall vegetative cover of the area.

Natural erosion rates have been accelerated by the extent and frequency of surface disturbances associated with mechanical vegetation control (roller drum chopping and bushhogging). However, hexazinone application for range vegetation management is replacing drum chopping as an environmentally and economically sound alternative for restoring degraded sandhill ecosystems suffering from hardwood encroachment (U.S. Air Force, 2003). The areas where drum chopping has been excluded, include: the wetland interior in the northeast section of the TA B-75, target surfaces, small arms target berms, and the ALARNG quadrant tank gun target area (also on B-75). Drum chopping is prohibited in the ALARNG quadrant because of the subsurface network of electrical cables. Test areas most prone to soil erosion are the slopes, which have become steeper and shorter as a consequence of long-term soil loss. Generally, as the percent of the slope increases, the length of the slope decreases and the forces of gravity increase the water erosion potentials. Slopes of 2 percent and 3 percent have been found to erode at appreciable rates (U.S. Air Force, 2000).

But, slopes with gradients of 3 to 9 percent are of greatest environmental concern. Severe erosion is occurring on the side slopes of some Lakeland soils, main interior roads, and watershed areas that outfall into adjacent streams (B-75).

No Action Alternative Summary: The No Action Alternative for TAs A-77, A-78, A-79, B-7, and B-75 would have impact to soils from munitions residue and erosion. Test area A-73 is not included in this alternative. Munitions residue may affect soil quality by introducing metal residues; however, the predicted concentrations are not likely to approach USEPA risk-based thresholds. Copper and lead components of munitions fired into target berms would degrade over time and may become soluble in the soil solution and migrate along groundwater gradients of the surficial aquifer system. *Test Area (TA) B-75 Final Range Environmental Assessment (REA)* outlines procedures to reduce potential impacts from ordnance. The major activities that could contribute to erosion on the training and test areas include air-to-surface bomb delivery training, air-to-surface gunnery operations, and surface-to-surface small arms training. In addition to soil disturbance caused by the munitions, erosion could also result from vehicle and foot traffic associated with ordnance retrieval and ground training activities. As long as BMPs are implemented, the chemical materials and erosion impacts to soil may be reduced and range sustainability increased (see summary of management practices in Section 5.2). These practices comply with AFI 13-212, which requires the range to be cleared of munitions debris on a regular basis.

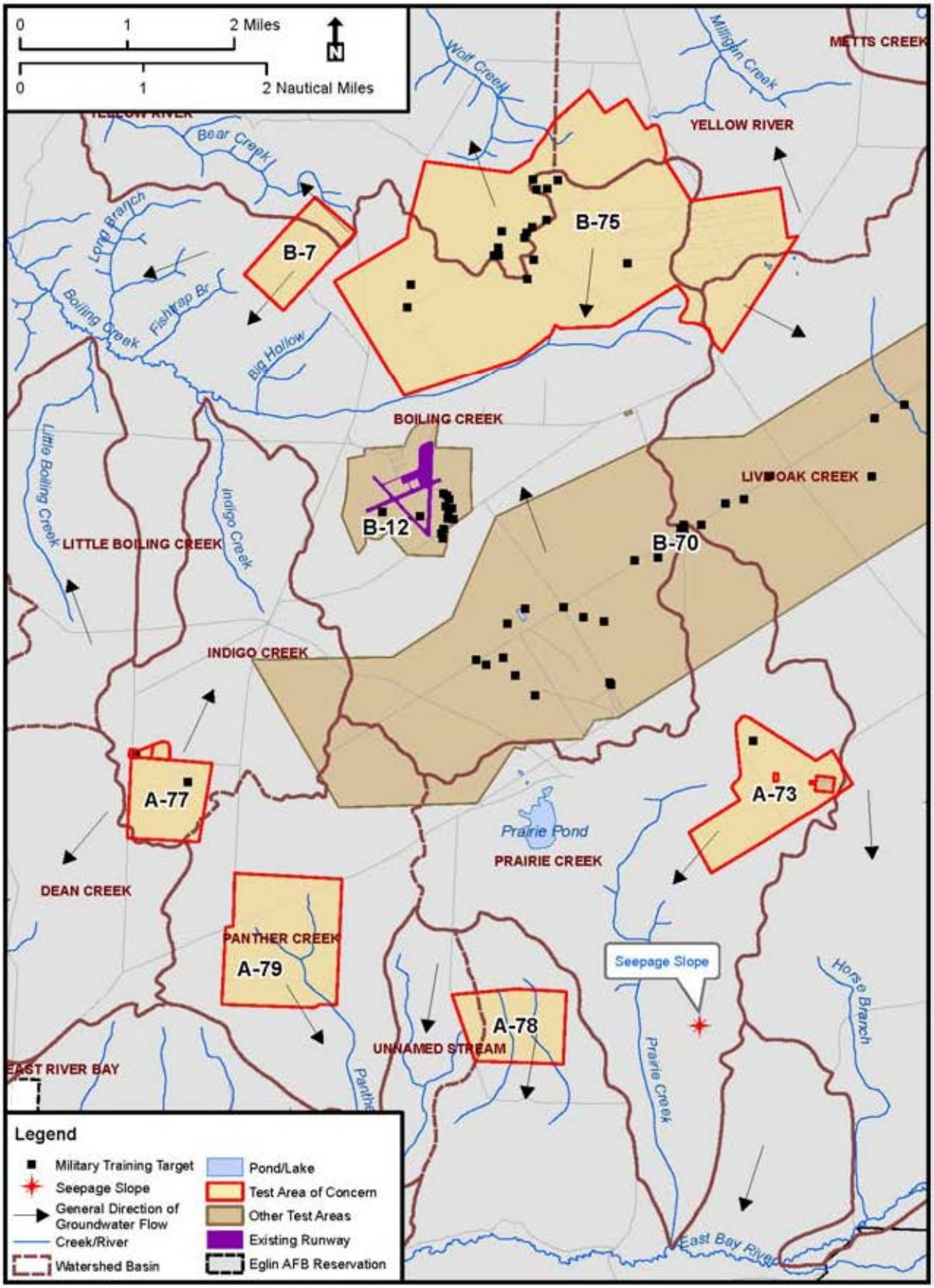

Figure 3-2. Placement of Military Training Targets Upland of the General Flow of Groundwater

3.2.2.2 Alternative 1

Munitions Residue

Small arms training is the mission category that could result in the greatest deposition of chemical materials (specifically lead and copper) into the soil, and it is the focus of the analysis for potential impacts to soil by munitions residue. Under the Alternative 1 Action, 7.62-mm small arms expenditures would not increase at TAs A-77, A-78, or B-75, but training added to TA A-73 and A-79, however small in scope (Table 2-1, Table 2-2, Table 2-4), could potentially impact soils. Test area A-73 installed a ballistic containment system (bullet trap) on the western portion of the range to reduce potential munitions residue by recapture. Expenditure on B-75 exceeds expenditure at any of the other test areas and the resulting concentrations of metal of concern (copper and lead) on B-75 or at any other target are not likely to approach USEPA risk-based thresholds. Adherence to the management practices identified in the No Action Alternative would reduce potential impacts from munitions residue.

Soil Erosion

Alternative 1 Action would potentially impact soil erosion on each test area the same as the No Action Alternative. The addition of small arms training at A-73 was added with a bullet trap that will minimize potential erosion from projectile impacts. Expenditure from air-to-surface bomb delivery training, air-to-surface gunnery operations, and surface-to-surface small arms training have moderate to high potential for erosion on test and training areas. Erosion resulting from vehicle and foot traffic associated with ordnance retrieval and ground training activities may increase with the addition of future foreseeable activities. Because new convoy training vehicles like the JLTV and the MRAP vehicle are of similar size and utilized like traditional vehicles in convoy training missions, no increase for erosion is expected with adherence to the management practices (identified in Section 5.2). Likewise, if the CV-22 Osprey will replace HH-60 helicopter in gun-mounted operations, similar impacts would be expected from the operation of the aircraft perhaps even greater due to the heavier aircraft's twin rotors (Caldwell, 2012). HLZs on the test ranges experience erosive winds from hovering/take-offs/landings.

3.2.2.3 Alternative 2

Under Alternative 2, 7.62-mm small arms expenditures could double at each test site, except at B-75, which has the largest expenditure (16,710,123 rounds) of all test sites for all three alternatives; therefore, assuming that small arms training activities are spread evenly between target berm locations at any of the test areas, the potential for soil impact by munitions residue is the same as the No Action Alternative, potentially impacting the quality of the soil but not at levels (for copper or lead) that would approach EPA risk-based concentrations. Adherence to the management practices identified under the No Action Alternative would reduce potential impacts due to munitions residue.

Soil Erosion

Under Alternative 2, potential for soil erosion would result from air-to-surface bomb delivery training, air-to-surface gunnery operations, and surface-to-surface small arms training as described under the No Action Alternative. Under Alternative 2, nearly 4,012 inert bombs could

be expended annually on TA B-75, which is the same for the No Action Alternative but is a three hundredfold decrease from Alternative 1. Ground training activities occurring on the test area could also contribute to erosion. Adherence to the management practices identified under the No Action Alternative would reduce the potential for erosion at this level of activity.

3.3 WATER RESOURCES

3.3.1 Affected Environment

Water resources on TAs A-73, A-77, A-79, B-7 and B-75 include groundwater, surface water, wetlands, floodplains, and the coastal zone (Figure 3-3). Site-specific information on the water resources associated with training and testing areas is contained in the following paragraphs. Pertinent regulations are provided in Appendix A, *Relevant Laws, Regulations, and Policies*.

Groundwater

Two major aquifers underlie Eglin AFB: the surficial aquifer, also known as the sand and gravel aquifer, and the Floridan aquifer. The surficial aquifer's water table is generally unconfined, near the surface, and separated from the underlying, confined (under pressure) Floridan aquifer. The surficial aquifer is composed of mainly clean, fine-to-coarse sand and gravel, while the Floridan aquifer consists of a thick sequence of interbedded limestone and dolomite.

Water quality of the surficial aquifer is generally good, but is vulnerable to contamination from surface pollutants due to its proximity to the ground surface (U.S. Air Force, 2007a). The surficial aquifer is not a primary source of domestic or public water supply on Eglin AFB because of the large quantities of higher quality water available from the underlying upper limestone of the Floridan aquifer (U.S. Air Force, 2007a). Throughout the Eglin AFB reservation, the Floridan aquifer is bound above and below by the Pensacola Clay bed and restricts the downward migration of pollutants and restricts saline water from Choctawhatchee Bay and the Gulf of Mexico from entering the Upper Limestone layer of the aquifer. Potable water wells are not located on TAs A-73, A-77, A-78, A-79, or B-7, and B-75.

The surficial aquifer system is in direct contact with surface waters on Eglin AFB. Discharge of groundwater constitutes the base flow for most streams and rivers, such as Holley Creek just south of TA B-75. TA A-73, A-77, A-78, and A-79 are located in the Coastal Lowlands region where the water table may be within a few feet (36 inches) of land surface. In the Western Highlands region (TA B-7), the water table may occur at considerable depth below land surface (80 inches), but the position of the surficial aquifer near the surface, and its relatively high percolation rates, make the aquifer vulnerable to contamination by surface pollutants. Lateral migration of contaminants towards surface water discharge points potentially facilitates the transfer of groundwater pollutants to area streams, rivers, and wetlands.

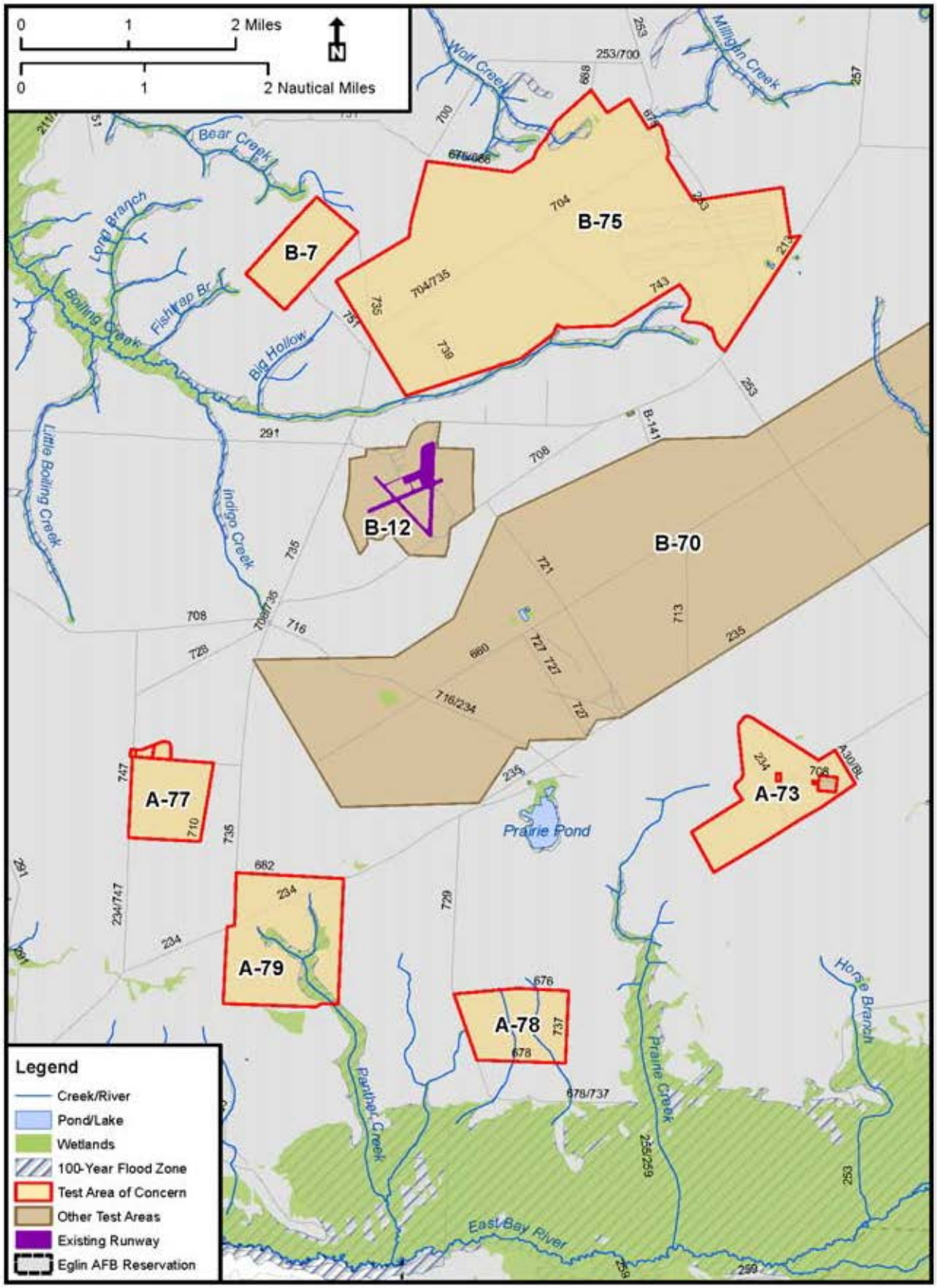

Figure 3-3. Surface Water Resources on Training and Test Areas A-73, A-77, A-79, B-7, B-75

Contamination of the sand and gravel aquifer has occurred through past base-related activities. Several base IRP sites report various amounts of pesticides, heavy metals, petroleum hydrocarbons, and other compounds throughout the Eglin AFB land test areas (U.S. Air Force, 1995). However, no active ERP sites are located in any of the test areas analyzed in this REA.

Surface Water

Surface waters are any waters that lie above groundwater, such as streams, springs, ponds, lakes, rivers, bayous, and bays. There are no perennial (annual flow) streams located within the boundaries of TA B-75; however, an intermittent (seasonal flow) stream associated with Wolf Creek (a steephead seepage stream) is located within the northern border of TA B-75. In addition, a portion of the Holley Creek riparian zone lies within TA B-75. Bear, Holley, Big Hallow, Wolf, and Milligan Creeks occur within 0.62 mile of the B-75 TA. The watershed from B-75 generally drains into the Wolf Creek floodplains to the north and Holley Creek to the south. TA A-77 drains into Indigo Creek (more than 1 mile away), which discharges to the Yellow River. TA A-78 drains into East Bay Swamp (0.5 mile away), and ultimately into the East Bay River. Johnson's Pond, located in the northeast corner of A-79, provides a headwater and tributary for Panther Creek, which feeds into the East Bay River. Johnson's Pond has been flooded by means of a gated weir in the past for use as an air-to-water test area. Boiling Creek drains the area south of TA B-7 into the Yellow River (0.34 mile away); and B-7's northern corner contains the headwaters of Bear Creek (0.037 mile). Surface water resources are shown in Figure 3-3.

The State of Florida has developed and retains jurisdiction for surface water quality standards for all waters of the state in accordance with the provisions of the CWA. Section 303 of the CWA requires the state to establish water quality standards for waterways, identify those that fail to meet the standards, and take action to clean up these waterways. Florida recently adopted the Impaired Waters Rule (IWR) (Florida Administrative Code [FAC] Chapter 62-303), with amendments, as the new methodology for assessing the state's waters for 303(d) listing. The FDEP submits names of surface waters that are determined to be impaired, using the methodology in the IWR and adopted by secretarial order, to the USEPA for approval as Florida's 303(d) list. The FDEP submits updates to Florida's 303(d) *List of Impaired Surface Waters* to the USEPA every two years. The *2008 Integrated Water Quality Assessment for Florida: 2008 305(b) Report and 303(d) List Update* (FDEP, 2008) satisfies the listing and reporting requirements of Sections 303(d) and 305(b) of the CWA.

Impaired waters on or adjacent to Eglin AFB include: Boggy Bayou, Poquito Bayou, Rocky Bayou State Park, Choctawhatchee Bay, East Bay, and Yellow River (FDEP, 2008; FDEP, 2012). The land areas of TAs A-73, A-77, A-78, A-79, B-7, and B-75 that drain into basins constitute a small fraction of the total land area that drains into the receiving waters. Industry, agriculture, and waste processing in these areas are major contributors of water run-off and effluent components (i.e., Total coliform, Enterococci, etc.) to the receiving water bodies. There is no clear association between the impairment status of the basins and activities occurring on the testing and training areas.

The Yellow River Marsh Aquatic Preserve, an Outstanding Florida Water, is immediately adjacent to Eglin AFB. TAs B-7 and A-77 drain into streams that feed into the Yellow River. It is the FDEP's policy to afford the highest protection to Outstanding Florida Waters. No

degradation of water quality, other than that allowed in Rule 62-4.2.4.2(1) and (2), is permitted in these waters.

Surface waters on Eglin AFB are Class III waters, meaning that they are designated for "recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife" (FDEP, 2008). As of 2000, TAs B-7 and A-78 fully met water quality standards listed in Table 3-8.

Data for TAs A-77 and A-79 were lacking so that water quality assessments could not be made. However, a biological assessment (U.S. Air Force, 2003a) of Panther Creek at Eglin Road 678 downstream of TA A-79 indicated a healthy biological community. Biological assessments are one indicator of good surface water quality.

Table 3-8. Water Quality Criteria for Class III Waters

Parameter	Units	Class III
Turbidity	Nephelometric Turbidity Unit (NTU)	≤29 above background
Dissolved Solids	milligrams per liter (mg/L)	None
pH	pH units	No more than one unit change above or below background
Chlorides	mg/L	None
Fluorides	mg/L	≤10.0
Conductivity	Micromho	No increase above 50% of background or 1,275
Dissolved Oxygen (DO)	mg/L	Not less than 5.0
BOD	mg/L	No increase such that DO drops below limit for any class.
Nutrients: Total Phosphorus, Total Nitrogen		No alteration in nutrients such that an imbalance in natural populations of aquatic flora or fauna results.
Total Coliform	#/100 mL	≤2,400 in any one sample
Fecal Coliform	#/100 mL	≤800 in any one sample
Copper	micrograms per liter (µg/L)	≤(.8545(in hardness) – 1.465)
Iron	mg/L	≤1.0
Lead	µg/L	(1.273(in hardness) – 4. 705)
Zinc	µg/L	(0.8473(in hardness) + 0.7614)
Mercury	µg/L	≤0.012

BOD = biochemical oxygen demand; DO = dissolved oxygen; µg/L = micrograms per liter; mg/L = milligrams per liter; NTU = Nephelometric Turbidity Unit; pH = potential of hydrogen

Wetlands

Wetlands are areas of transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (USFWS, 1979). Abiotic and biotic environmental factors such as morphology, hydrology, water chemistry, soil characteristics, and vegetation contribute to the diversity of wetland community types. The term *wetlands* describe marshes, swamps, bogs, and similar areas. Local hydrology and soil saturation largely affects soil formation and development, as well as the plant and animal

communities found in wetland areas (USEPA, 1995). Wetlands often are categorized by water patterns (the frequency or duration of flooding) and location in relation to upland areas and water bodies. Wetland hydrology is considered one of the most important factors in establishing and maintaining wetland processes (Mitsch and Gosselink, 2000).

Jurisdictional wetlands are those over which the U.S. Army Corps of Engineers (USACE) has regulatory control under Section 404 of the CWA. Wetlands are defined in the USACE *Wetland Delineation Manual* as "those 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). The majority of jurisdictional wetlands in the U.S. are described using three principal wetland delineation criteria: hydrophytic vegetation, hydric soils, and hydrology (USACE, 1987). USFWS uses a simpler classification system that is satisfied by any one of the above three characteristics.

USACE is the lead agency in protecting wetland resources and invokes jurisdiction over federal wetlands (33 CFR 328.3) under Section 404 of the CWA (30 CFR 330) and Section 10 of the Rivers and Harbors Act (30 CFR 329). The USEPA assists USACE (in an administrative capacity) in the protection of wetlands (40 CFR 225.1 to 233.71). The State of Florida regulates wetlands under the Wetlands/Environmental Resource Permit program under Part IV, Florida Statutes, Section 373.

In addition, the USFWS and the National Marine Fisheries Service have important advisory roles. The FDEP's Chapter 62-312, *Dredge and Fill Program*, affords regulatory protection to wetland resources (protection from excavating or filling a wetlands area with dirt, rip-rap, etc.) at the state level. FDEP issues a Section 401 certification under the authority of the CWA (40 CFR 230.10[b]). Section 401 of the CWA requires federal agencies to obtain certification from the state before issuing permits that would result in increased pollutant loads to a water body. The certification is issued only if such increased loads would not cause or contribute to exceedances of water quality standards (USEPA, 2009).

A total of approximately 12 acres of emergent, palustrine wetlands occur within the boundaries of TA B-75, which corresponds to only 0.33 percent of the total area. These wetlands are associated with the headwaters of Wolf Creek in the northeast portion of the test area and Holley Pond near the eastern boundary but a considerable distance from mission activities. Other wetlands occur in association with the surrounding creeks adjacent to TA B-75. Panther Creek is within the boundaries of TA A-79. Mission demolition activities on A-79 are conducted in a clay pit and not in the wetland footprint.

Floodplains

Floodplains are lowland areas adjacent to surface water bodies (i.e., lakes, wetlands, and rivers) that are periodically covered by water during flooding events. Floodplains and riparian habitat are biologically unique and highly diverse ecosystems supporting a rich diversity of aquatic and terrestrial species (Mitsch and Gosselink, 2000). Floodplain vegetation promotes bank stability and provides a shading effect to moderate water temperatures. Vegetation and soils act as water filters, intercepting surface water runoff before it reaches lakes, streams, or rivers, and storing floodwaters during flood events. This filtration process aids in the removal of excess nutrients,

pollutants, and sediments from the water and helps reduce the need for costly cleanups and sediment removal. Floodplains also reduce downstream flooding by increasing upstream storage in wetlands, sloughs, back channels, side channels, and former channels.

Any actions being considered by federal agencies must be evaluated to determine whether they would occur within a floodplain. Floodplains that must be considered include those areas with a 1-percent chance of being inundated by floodwater in a given year (also known as a 100-year floodplain). Executive Order (EO) 11988, *Floodplain Management* (1977, 42 *Federal Register* 26951), requires federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains and to avoid floodplain development whenever possible. Additionally, EO 11988 requires federal agencies to make every effort to reduce the risk of flood loss, minimize the impact of floods on human health, safety, and welfare, and preserve the natural beneficial value of floodplains. The order stipulates that federal agencies proposing actions in floodplains consider alternative actions to avoid adverse effects, avoid incompatible development in the floodplains, and provide opportunity for early public review of any plans or proposals. If adverse effects are unavoidable, the proponent must include mitigation measures in the action to minimize impacts.

Parts of the floodplain that are also considered wetlands will, in addition to floodplain zonings, receive protection from federal, state, and local wetland laws. These laws, such as the USACE Section 404 Permit Program, regulate alterations to wetlands to preserve both the amount, connectivity and integrity of the nation's remaining wetland resources. Specific wetland regulations are described in Appendix A.

Approximately 29 acres of TA B-75 are located within the 100-year floodplain and are associated with Wolf Creek. Floodplains represent only 0.82 percent of the land area. Other floodplains are associated with the surrounding creeks adjacent to TA B-75. Panther Creek and its 100-year floodplain occur on TA A-79, but mission activities are not permitted in the floodplain and wetland area. The TA A-79 has the least amount of total expenditure. The A-79 demolition exercises are conducted in a clay pit reducing potential impact to reach surface waters.

Coastal Zone

The term *coastal zone* is defined as coastal waters and adjacent shore lands, which strongly influence one another, located in proximity to the several coastal states. The coastal zone includes islands, transitional and inner tidal areas, salt marshes, wetlands, and beaches. Coastal waters are defined as any waters adjacent to the shoreline that contain a measurable amount of sea water, including but not limited to sounds, bays, lagoons, bayous, ponds, and estuaries. The seaward boundary of the coastal zone is the limit of state waters, which for the Gulf coast of Florida is 9 nautical miles from shore. The entire land mass of Florida is considered part of the coastal zone and is subject to the CZMA.

Federal agency activities potentially impacting the coastal zone are required to be consistent, to the maximum extent practicable, with approved state Coastal Zone Management Programs. Federal agencies make determinations as to whether their actions are consistent with approved state plans. Eglin AFB submits consistency determinations to the state for review and concurrence. All relevant state agencies must review the Proposed Action and issue a

consistency determination. The Florida Coastal Management Program is composed of 23 Florida statutes that are administered by 11 state agencies and four of the five water management districts.

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA (Appendix F, *CZMA Consistency Determination*).

3.3.2 Environmental Consequences

Water quality analysis focuses on the potential for chemical material by-products to enter Wolf and Holley Creeks that border the TA B-75 and the wetland system located in the northeastern portion of the test area. Also, TA B-7 in close proximity to Bear Creek, and the head waters of Panther Creek are within the boundaries of A-79 (Figure 3-3). Other test areas are more than a half mile away from surface water bodies, wetlands, and floodplains. Potential contaminant transport mechanisms include surface run-off and groundwater recharge. In general, the climate, physical, and chemical characteristics of the dominant Lakeland Sand soils make the soil prone to relatively rapid contaminant infiltration and leaching into groundwater. Once in the groundwater, contaminants may flow along subsurface gradients toward stream outflows.

As mentioned in Section 3.2, previous environmental analysis of TA B-75 missions (U.S. Air Force, 2000; U.S. Air Force, 2007a) identified potential leaching of metals derived from small arms munitions into groundwater as the primary water resource issue. Copper and lead are considered materials of concern on the test areas. Air-to-Surface Bomb Delivery Training, Air-to-Surface Gunnery Operations, and Surface-to-Surface Small Arms Training present potential erosion issues. Mission activity on B-75 has the highest potential for erosion, and transporting non-point source pollution to surface waters on the north and south sides of the range. Erosion would be expected at the other test sites as well because of the similar soils, contours, and mission activities, but to a lesser degree because of fewer scheduled missions and less expenditure at A-73, A-77, A-78, A-79, B-7 and B-75.

The susceptibility of water resources to contamination by soluble metals is partly dependent on the distance between the water and contamination source. Studies of surface water lead transport at a public shooting range in Virginia, discussed in U.S. Air Force (2000), found that some surface water samples at the range had lead concentrations comparable to that of natural water, while other samples had values 50 to 100 times the median concentration for natural waters. The highest lead concentrations were found in samples closest to the shooting backstop. It was concluded that the higher concentrations near the backstop were a result of rapidly corroding lead bullets deposited at a rate of between 1 and 3 million rounds per year. Small arms training would expend at least 3 million rounds at A-77 and A-78 and more than 16 million at B-75, but targets are generally located the furthest from surface water resources at these test areas.

3.3.2.1 No Action Alternative

Groundwater

Munitions residue could migrate into the groundwater of TA B-75 in levels that could be of environmental concern, particularly for metals. Holley and Wolf Creeks were considered to be

at risk of contamination if lead or other metals are transported in the subsurface water column (U.S. Air Force, 2000). However, the occurrence or extent of groundwater contamination is currently unknown. No groundwater monitoring wells are located on any of the test areas, and no water well sampling or analysis for potential contamination has been performed on any water wells in proximity to TAs A-77, A-78, A-79, B-7 or B-75. TA A-73 is not included in the No Action Alternative. Groundwater quality at TA B-75 may not be impacted by the proposed activities because calculated soil concentrations for metals, using current expenditure numbers with methodology developed from a previous site study at B-75, are not expected to exceed USEPA risk-based thresholds, as described in Section 3.2.2.1. Also, previous IRP studies determined that Eglin soils have a low affinity for downward metals migration into groundwater. Groundwater quality at TA B-75 may not be impacted by the proposed activities because (1) calculated soil concentrations of metal contaminants are not expected to approach USEPA risk-based thresholds, as described in Section 3.2.2.1 and (2) the observation that Eglin AFB soils have low affinity for downward metals migration into groundwater (especially with the surficial aquifer lying 36 to 80 inches below the surface of the test areas). With implementation of water quality management requirements, identified in Section 5.2 (Soil and Water Resource Management Practices), the potential for contamination would be greatly reduced.

Surface Water

The proximity of small arms target berms to Holley Creek was identified as a potential water resource concern in U.S. Air Force (2000). At that time, two target berms were located on sensitive riparian slopes susceptible to erosion. However, more recently provided information (U.S. Air Force, 2007a) shows that target berms no longer remain in these locations. If berms are located near surface waters in the future, metals (particularly lead) dissolved in the soil solution may enter the streams by seepage and spring sapping recharge, or could be transported by surface erosion.

The presence and concentration of metals in surface waters on and near TAs A-77, A-78, A-79, B-7, and B-75 is unknown. Surface water sampling and analysis for potential contamination has not been conducted for all test areas. However, the distance between testing sites at TA B-75 to the perennial streams systems (Bear, Holley, Big Hallow, Wolf, and Milligan Creeks) adjacent to the test area is fairly large. Test Area A-79 has the most area of surface water on the boundary, but the least amount of baseline expenditures. Mission activities on A-79 do not include small arms training, and demolition activities are conducted in a contained clay pit. The test area boundary for TA B-7 is approximately 200 feet and would have the greatest potential for munitions residue to be transported from gun training operations to Bear Creek. In the case of lead, the risk to surface waters is assumed to be minimal if the source is more than 0.25 mile away (USFWS, 2008). According to target locations provided in the *Test Area B-75 Final Environmental Baseline Document (EBD), Revision 1* (U.S. Air Force, 2007a), primary targets are placed more than 0.25 mile from surface waters in and adjacent to TA B-75 and should be for B-7 (Figure 3-3). The surrounding surface waters are therefore considered to be at minimal risk from groundwater-based transport of contaminants, particularly lead. The ground cover would likely serve as a pollution filter, intercepting surface runoff before it reaches these surface waters and the associated wetlands and floodplains. Surface water is not anticipated to be negatively affected by run-off from TA A-77, A-78, A-79, B-7, and B-75. With implementation of erosion control management requirements, identified in Section 5.2, the potential for sedimentation would be greatly reduced. The same management requirements would be enforced at B-7.

Wetlands

Small areas of wetlands occur within the boundaries of TA B-75 and a larger acreage on A-79 associated with Panther Creek. In accordance with the CWA (USC 1344-Section 404) and AFI 32-7064, all activities proposed at TA B-75 and A-79 would avoid direct and indirect impacts to wetland resources. Furthermore, implementation of specific wetland management requirements and water quality management requirements would minimize the potential for impacts (U.S. Air Force, 2007a). A small arms firing range on B-75 is located south and down slope of the wetland area associated with Wolf Creek. This physical orientation minimizes the potential for impacts due to run-off and soil erosion. Since there are no sensitive slopes in proximity to the firing range, the risk of metals transport by soil erosion is minimized. Soil erosion that does occur will likely remain on TA B-75 and be limited to the immediate areas of deposition. No specific activities that could impact the wetland associated with Holley Pond are identified in the 2000 PEA or the 2007 EBD. Ground operations on A-79 conduct demolition training using charges, fuses, detonation cord, and dynamite, but in a reconditioned clay pit at TA A-79 which help minimize transport of debris offsite. Ground training personnel would avoid ground-disturbing activities within 100 feet of wetlands.

Floodplains

Approximately 29 acres of floodplain resources (within the Federal Emergency Management Agency [FEMA] flood zone) associated with Wolf Creek and Holley Pond occur within the boundaries of TA B-75. Other sizable floodplains within the FEMA flood zone occur outside of the test area in association with the surrounding creeks adjacent to the test area. Impacts to floodplains would not be significant under the No Action Alternative. None of the actions on TA B-75 involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. Ground training would occur within the floodplain but the activity would not alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (Appendix F, *CZMA Consistency Determination*).

3.3.2.2 Alternative 1

Ground Water

Impacts to ground water are not likely to be significant under Alternative 1 (even with the addition of future use activities on any of the test areas and the addition of small arms training on TA-73). TA A-73 operates as a small arms firing range equipped with a state-of-the-art bullet trap. The test area is not near water and is not expected to have any impact on water resources. Analysis of soils in Section 3.2.2 examined the potential for contaminants (copper and lead) from small arms munitions items to migrate from the surface into groundwater and exceed USEPA

standards for groundwater quality. A lack of groundwater monitoring data on test areas precludes any other analysis. Munitions expenditure levels associated with this alternative are not expected to cause metal soil concentrations sufficient to approach USEPA risk-based thresholds. With implementation of the water quality management requirements identified in Section 5.2, the potential for groundwater contamination would be greatly reduced.

Surface Water

There would be no significant impacts to surface waters under Alternative 1. Mission activities have no mechanism for direct impacts to surface waters because there are no active targets near surface waters. Ground cover would likely serve as a pollution filter, intercepting surface runoff before it reaches these surface waters and the associated wetlands and floodplains. Soil erosion caused by bombing exercises could impact surface water quality by transporting metal residue from expended munitions. Erosion on TA B-75 is associated with sloped areas, but there is no evidence that these areas are impacting surface waters. Implementation of erosion control management requirements, identified in Section 5.2, would greatly reduce the potential for erosion impacts caused by the level of expenditures and ground activities.

Wetlands

There would be no significant impacts to the approximately 12 acres of wetland habitat occurring on TA B-75 under Alternative 1. In accordance with the CWA (USC 1344-Section 404) and AFI 32-7064, all activities proposed at TA B-75 would avoid direct and indirect impacts to wetland resources. Furthermore, implementation of specific wetland management requirements and water quality management requirements would greatly reduce the potential for impacts (U.S. Air Force, 2007a). A small arms firing range is located south and down slope of the wetland area associated with Wolf Creek. This physical orientation minimizes the potential for impacts due to runoff and soil erosion. The risk of metals transport by soil erosion is minimized by the locating firing ranges away from sloped areas. Soil erosion that does occur will likely remain on test areas because of the distance from targets or in the case of A-79 and B-7, the lower level of mission operations and lowest levels of baseline expenditures. No specific activities that could impact the wetland associated with Holley Pond are identified in the 2000 PEA or the 2007 EBD.

Floodplains

There would be no significant impacts to floodplains under Alternative 1. Floodplains within the boundaries of TA B-75 are associated with Wolf Creek and Holley Pond. Other sizable floodplains within the FEMA flood zone occur outside of the test area in association with the surrounding creeks adjacent to the test area. None of the actions on TA B-75 involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. Ground training within the floodplain but the activity would not alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (Appendix F, *CZMA Consistency Determination*).

3.3.2.3 Alternative 2

Ground Water

Impacts to ground water are not likely to be significant under Alternative 2, which also includes the addition of TA A-73 as mentioned previously under Alternative 1 (Section 3.3.2.2). The analysis in Section 3.3.2.1 examined the potential for contaminants from expended items to migrate from the surface into ground water. A lack of ground water monitoring data at testing sites precludes any other analysis, but Eglin AFB soil characteristics would likely bind metals and not allow downward migration to ground water. Munitions expenditure levels associated with this alternative are not expected to accumulate metal concentration in soil to exceed USEPA risk-based thresholds. With implementation of the water quality management requirements identified in Section 5.2, the potential for ground water contamination would be greatly reduced.

Surface Water

There would be no significant impacts to surface waters under Alternative 2 on TAs A-73, A-77, A-78, A-79, B7 and B-75. Mission activities have no mechanism for direct impacts to surface waters because there are no active targets near surface waters. Ground cover would likely serve as a pollution filter, intercepting surface run-off before it reaches these surface waters and the associated wetlands and floodplains. Soil erosion caused by bombing exercises could impact surface water quality by transporting metal residue from expended munitions. Erosion on TA B-75 is associated with sloped areas, but there is no evidence that these areas are impacting surface waters. Implementation of erosion control management requirements, identified in Section 5.2, would greatly reduce the potential for erosion impacts.

Wetlands

There would be no significant impacts to the approximately 12 acres of wetland habitat occurring on TA B-75 under Alternative 1. In accordance with the CWA (USC 1344-Section 404) and AFI 32-7064, all activities proposed at TA B-75 would avoid direct and indirect impacts to wetland resources. Furthermore, implementation of specific wetland management requirements and water quality management requirements would greatly reduce the potential for impacts (U.S. Air Force, 2007a). A small arms firing range is located south and down slope of the wetland area associated with Wolf Creek. This physical orientation minimizes the potential for impacts due to run-off and soil erosion. The risk of metals transport by soil erosion is minimized by the lack of sloped areas in proximity to the firing range. Soil erosion that does occur will likely remain on TA B-75 and be limited to the immediate areas of deposition. No specific activities

that could impact the wetland associated with Holley Pond are identified in the 2000 PEA or the 2007 EBD.

Floodplains

There would be no significant impacts to floodplains under Alternative 2 for the TAs A-73, A-77, A-78. Floodplains within and near the boundaries of TA A-79, B-75, and B-7 are associated with Panther Creek (A-79) and Wolf Creek and Holley Pond (B-7 and B-75). None of the actions on TA A-79, B-75, and B-7 involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. Ground training occurs within the floodplain of B-75 but the activity would not alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (Appendix F, *CZMA Consistency Determination*).

3.4 BIOLOGICAL RESOURCES

3.4.1 Affected Environment

Biological resources refer to the terrestrial and aquatic plant and wildlife species occurring on and near the test areas, along with the habitats in which they reside. Biological resources include sensitive habitats and species. The land areas at Eglin AFB support unusually diverse biological resources and may be classified according to community type based on Florida Natural Areas Inventory descriptions. The predominant community types on the test areas are Sandhill and Cleared Vegetated, although numerous other types also occur to a lesser extent (Figure 3-4).

Sandhill communities are characterized by an open savannah-like structure, with a canopy of widely spaced pine trees, a sparse midstory of deciduous oaks and other hardwoods, and a moderate to dense groundcover of grasses, forbs, and low shrubs (FNAI, 2010). Sandhill occurs on crests and slopes of rolling hills and ridges. Eglin AFB is considered an exemplary Sandhill area, and portions of the base are presumed to represent the historical structure and composition of this community type.

Cleared Vegetated communities may refer to areas where tree clearing or forestry operations have occurred in the past. A substantial portion of this community type coincides with habitat previously designated by the Florida Natural Areas Inventory as open grassland/shrubland. This habitat is characterized by grasses and low shrubs and is maintained with machinery or fire that removes or prevents future growth.

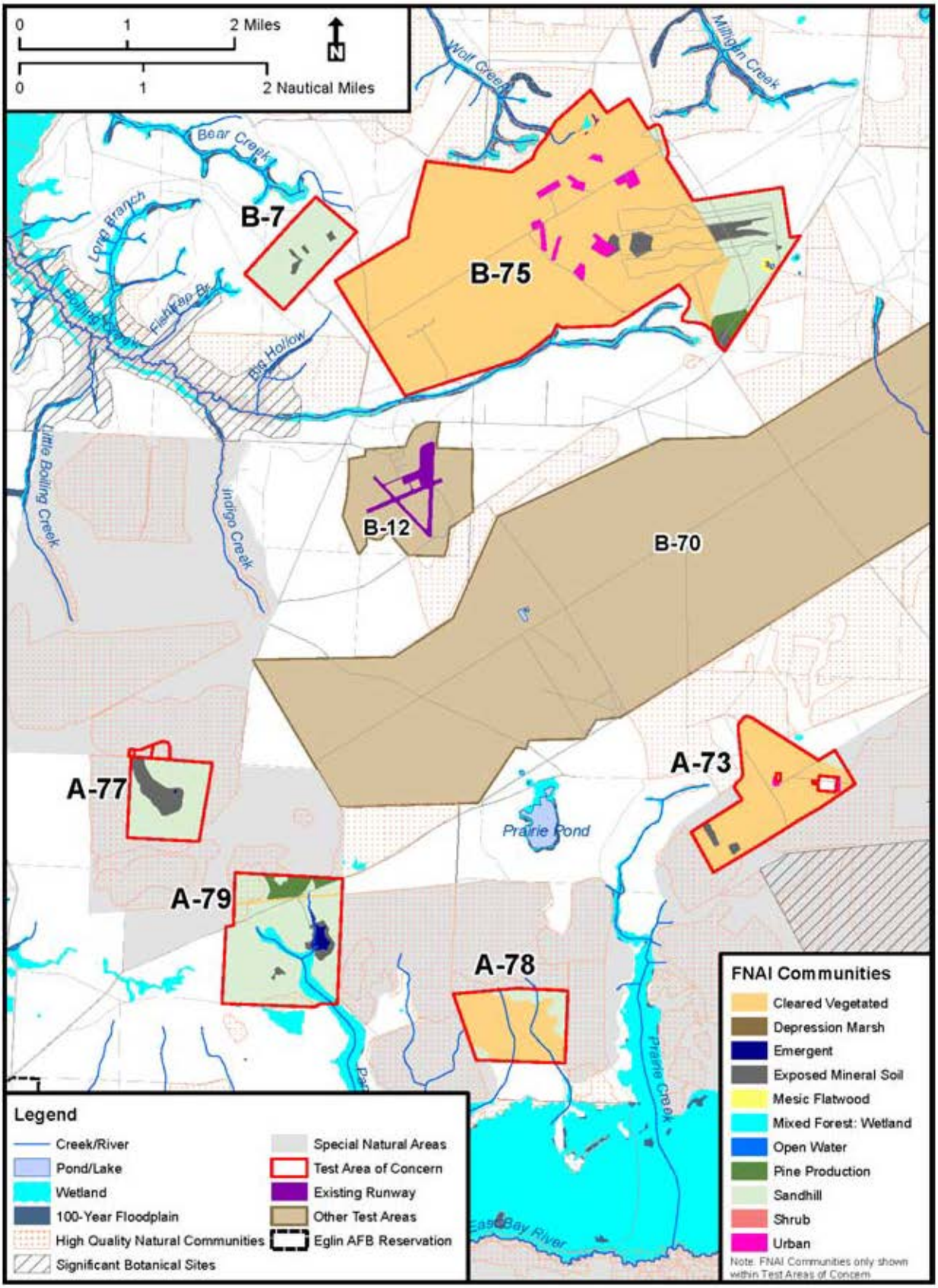

Figure 3-4. Ecological Communities and Habitats On and Near the Test Areas

Test Areas A-77, A-78, and B-7 are mostly cleared, relatively flat, and lack surface water. Open grasslands/shrublands make up the majority of land cover. The cleared areas consist of target areas, roadways, and bunkers established over grassy plains containing broomsedge, switch grass, grasses and herbs, and low-growing shrubs. TA A-79 is primarily wooded property surrounding a pond and a clay pit where training activities take place. Panther Creek runs south through the center of the test area. The uncleared portions of all four of the test areas contain forests of longleaf pine, live oaks, and turkey oaks. TA B-75 is predominately open grasslands/shrublands with interspersed areas of sandhills, flatwoods, urban/landscaped areas, and wetland/riparian habitat. TA A-73 is composed of primarily grassland/shrubland and pine sandhill habitat.

Plant and wildlife species typically associated with ecological communities found on the test areas are listed in Table 3-9. It is presumed that these species could occur on any of the test areas.

Table 3-9. Typical Species Found within Ecological Communities at the Test Areas

Plants		Animals	
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Sandhills			
Longleaf Pine	*Pinus palustris*	Red-cockaded Woodpecker	*Picoides borealis*
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*	Indigo Snake	*Drymarchon corais*
Saw Palmetto	*Serona repens*	Diamondback Rattlesnake	*Crotalus adamanteus*
Bracken Fern	*Pteridium aquilinum*	Six-lined Racerunner	*Cnemidophorus sexlineatus*
Blueberry	*Vaccinium* spp.	Florida Black Bear	*Ursus americanus floridanus*
Yaupon	*Ilex vomitoria*	Fox Squirrel	*Sciurus niger*
Gallberry	*Ilex glabra*	Least Shrew	*Cryptodus parva*
Gopher Apple	*Licania michauxii*	Cottontail Rabbit	*Sylvilagus floridanus*
Blackberry	*Rubus cuneifolius*	Pocket Gopher	*Geomys pinetus*
Sand Pine	*Pinus Clausa*	White-tailed Deer	*Odocoileus virginianus*
Pinewoods Bluestem	*Andropogon arctatus*	Feral Pig	*Sus scrofa*
Wiregrass	*Aristida stricta*	Raccoon	*Procyon lotor*
Wetland and Riparian (Freshwater)			
Yellow Water Lily	*Nymphaea Mexicana* 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	*Eumeces fasciatus*

Table 3-9. Typical Species Found within Ecological Communities at the Test Areas, Cont'd

Plants		Animals	
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Pitcher Plant	*Sarracenis purpurea*	Green Anole	*Anolis carolinensis*
Red Titi	*Cyrilla racemiflora*	Garter Snake	*Thamnophis sirtalis*
Tulip Poplar	*Liriodendrom tulipifera*	Indigo Snake	*Drymarchon corais*
Sweet Bay Magnolia	*Magnolia virginiana*	American Beaver	*Castor canadensis*
Red Bay	*Persea borbonia*	Parula Warbler	*Parula americana*
Flatwoods			
Longleaf Pine	*Pinus palustris*	Wood Duck	*Aix sponsa*
Runner Oak	*Quercus pumila*	Red-winged Blackbird	*Agelaius phoenicius*
Saw Palmetto	*Serona repens*	Cotton Mouth	*Agkistridon piscivorus*
St. John's Wort	*Hypericum brachyphyllum*	Flatwoods Salamander	*Ambystoma cingulatum*
Slash Pine	*Pinus elliottii*	River Otter	*Lutra canadensis*
Black Titi	*Cliftonia monophylla*	Beaver	*Castor canadensis*
Milkweed	*Asclepias humistrata*	Florida Black Bear	*Ursus americanus floridanus*
Pitcherplant	*Sarracenia* spp.	Gray Fox	*Urocyon cinereoargenteus*
Open Grassland/Shrubland			
Switchgrass	*Panicum virgatum*	Red-shouldered Hawk	*Buteo lineatus*
Broomsedge	*Andropogon virginicus*	Southeastern American Kestrel	*Falco sparverius paulus*
Big Bluestem	*Andropogon gerardii*	Florida Burrowing Owl	*Athene cunicularia*
Yellow Indian Grass	*Sorghastrum nutans*	Flycatchers	*Tyrannidae spp.*
Purple Lovegrass	*Eragrostis spectabilis*	Cotton Mouse	*Peromyscus gossypinus*
Woolly Panicum	*Dichanthelium acuminatum*	Slender Glass Lizard	*Ophisaurus attenuatus*
Forbs	*Euphorbiaceae* sp.	Gopher Tortoise	*Gopherus polyphemus*

Sensitive Habitats

Several sensitive habitats occur near, adjacent to, or, in a few cases, directly on the test areas (Figure 3-4). Sensitive habitats include areas that have been designated for special protection due to certain characteristics such as high species diversity, rare plant species, or other unique features. Such habitats include wetlands, floodplains, high quality natural communities, significant botanical sites, and special natural areas.

Wetlands are habitats that are inundated or where water is present at or near the surface for distinguishable periods of time throughout the year. Wetlands support a large variety of aquatic and terrestrial organisms, including vegetation, insects, amphibians, reptiles, birds, fish, and mammals. Floodplains are lowland areas adjacent to surface water bodies that are periodically covered by water during flooding events. Floodplains and riparian habitats may support a

diverse assemblage of aquatic and terrestrial species as well. Wetlands are located on TA A-79 and occur near all other test areas except A-77.

High quality natural communities are areas within Eglin AFB, identified by the Florida Natural Areas Inventory, that are distinguished by uniqueness of the community, ecological condition, species diversity, and presence of rare species. Such communities occur on TA A-79 and are adjacent to all other test areas except B-7. Significant botanical sites are designated because they contain rare plant species or because of the high quality or rarity of natural vegetative communities. Special protection is required at these sites because of 1) the high density of federal- and state-protected plant species and 2) the uniqueness of habitat that supports sensitive animals as well as plants. These sites do not occur on the test areas but are found near TAs B-7, B-75, and A-73. Special natural areas refer to areas supporting high-quality, remnant stands of old growth longleaf pine. Old growth longleaf trees are considered those that are more than 150 years old. Large tracts of special natural areas occur adjacent to TAs A-77, A-79, A-78, and A-73. The Patterson Natural Area, which borders TA A-73 to the south, is one of the largest, most significant areas of old growth longleaf pine remaining globally.

Sensitive Species

Sensitive species are defined as those species protected under federal or state law, as well as federal candidate species and state-listed species of special concern. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Candidate species are those species for which the USFWS has sufficient information to propose them as endangered or threatened under the Endangered Species Act (ESA), but for which listing activities are precluded by higher priority activities.

AFI 32-7064, Integrated Natural Resources Management, provides details on managing threatened and endangered species and migratory birds. Air Force activities that may affect federally protected species or their critical habitats are subject to Section 7 of the ESA. A Section 7 consultation with USFWS is required for actions with potential to take a federally listed species. While candidate species and species of special concern do not have statutory protection, Eglin AFB includes consideration of these species during environmental planning.

Locations of sensitive species and habitats near the test areas are shown in Figure 3-5 and Figure 3-6. Sensitive species with known or potential occurrence on the test areas are listed in (Table 3-10). These species have either been observed on or near the test areas, or potentially could occur due to the presence of suitable habitat or associated species. Refer to Appendix C, *Biological Resources*, for descriptions of these species.

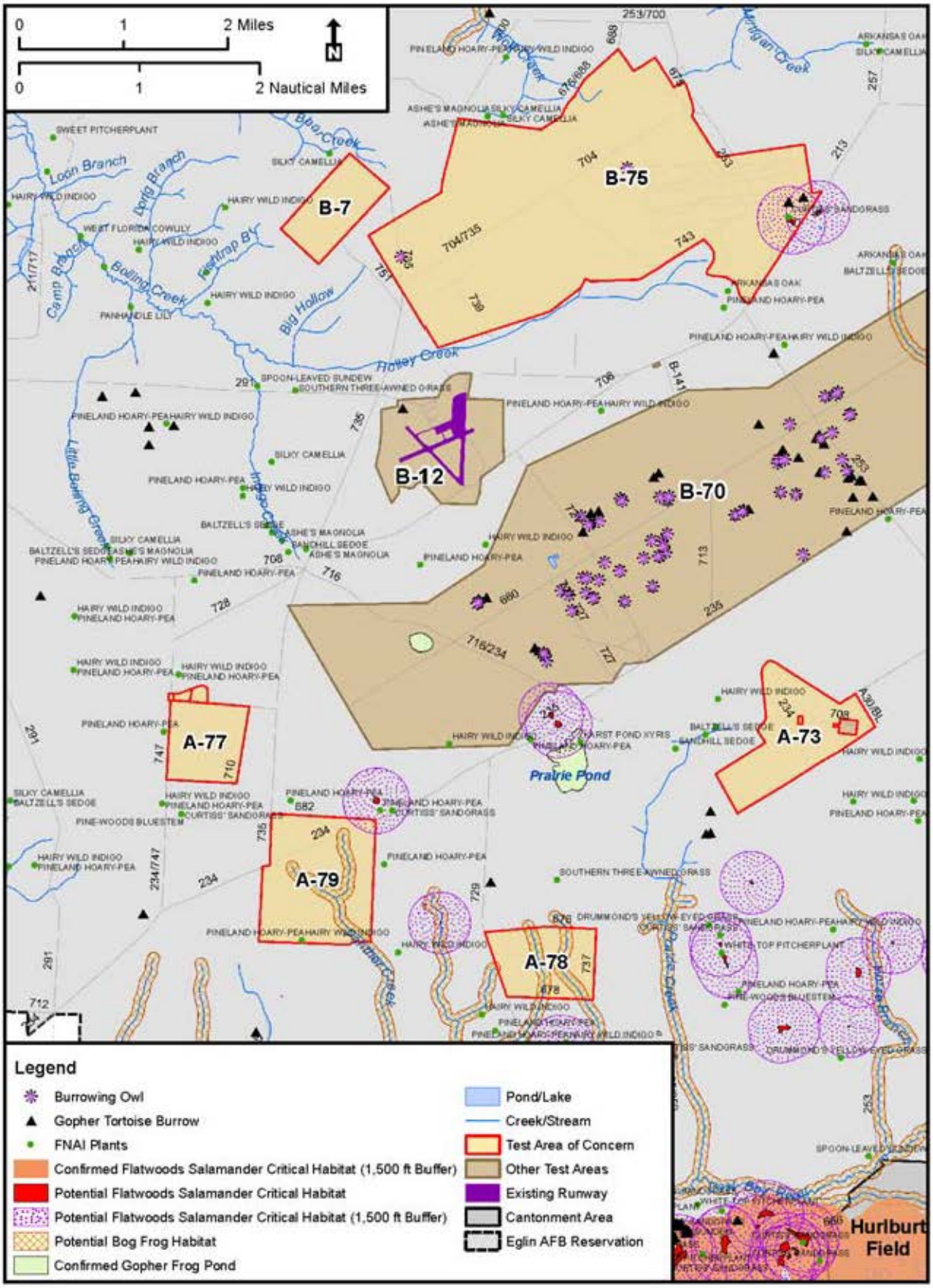

Figure 3-5. Sensitive Species and Habitats On and Near the Test Areas

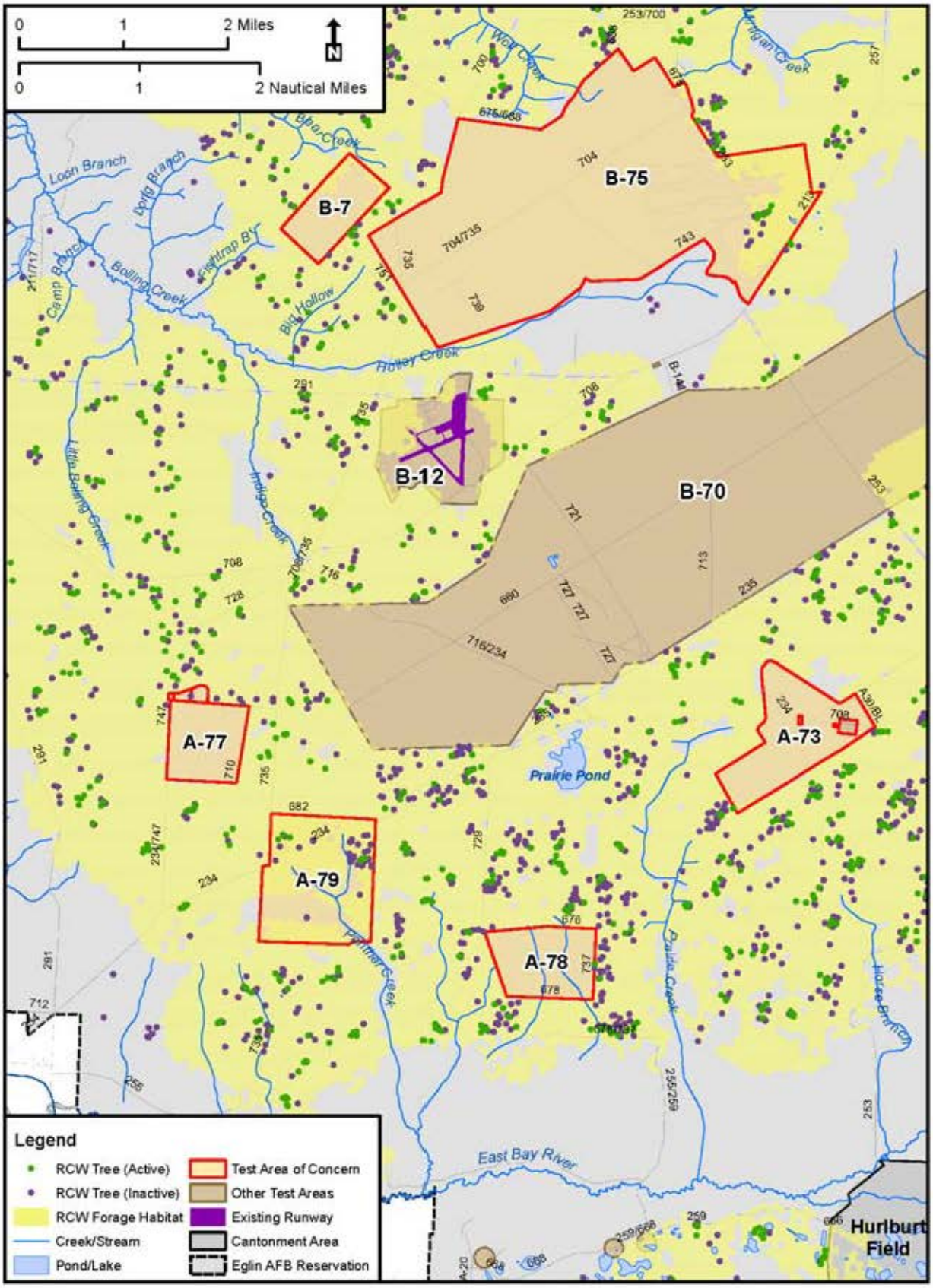

Figure 3-6. Red-cockaded Woodpecker Cavity Trees On and Near the Test Areas

Table 3-10. Sensitive Species with Known or Potential Occurrence on the Test Areas

Common Name	Scientific Name	Status	Test Areas
Amphibians			
Reticulated flatwoods salamander	*Ambystoma bishopi*	FE, SE	A-77, A-78, A-79, B-75
Gopher frog	*Rana capito*	SSC	A-78, A-79
Florida bog frog	*Rana okaloosae*	SSC	A-78, A-79, B-7
Pine barrens tree frog	*Hyla andersonii*	SSC	All test areas
Reptiles			
Eastern indigo snake	*Drymarchon corais couperi*	FT, ST	All test areas
American alligator	*Alligator mississippiensis*	FT(S/A), SSC	A-79
Gopher tortoise	*Gopherus polyphemus*	FC, ST	All test areas
Alligator snapping turtle	*Macroclemys temmincki*	SSC	A-79
Florida pine snake	*Pituophis melanoleucus*	SSC	All test areas
Birds			
Red-cockaded woodpecker	*Picoides borealis*	FE, ST	All test areas
Southeastern American kestrel	*Falco sparverius paulus*	ST	All test areas
Florida burrowing owl	*Athene cunicularia floridana*	SSC	All test areas
Mammals			
Florida black bear	*Ursus americanus floridanus*	ST	All test areas
Plants			
Baltzell's sedge	*Carex baltzellii*	ST	B-7, B-75
Curtis' sandgrass	*Calamovilfa curtissii*	ST	A-77, A-79, B-75, A-73
Southern threeawn grass	*Aristida simpliciflora*	SE	A-78
Pineland hoary-pea	*Tephrosia mohrii*	ST	A-78, B-75
Hairy wild indigo	*Baptisia calycosa*	ST	A-78, A-79, B-75
Arkansas oak	*Quercus arkansana*	ST	B-75
Ashe's magnolia	*Magnolia ashei*	SE	B-75
Silky camellia	*Stewartia malacodendron*	SE	B-75

FC = Federal candidate species
FE = Federally endangered
FT = Federally threatened
FT(S/A) = Federally threatened due to similarity of appearance to another species
SE = State endangered
ST = State threatened
SSC – State species of special concern

3.4.2 Environmental Consequences

This section discusses the potential impacts to habitats and species on the affected test areas for each alternative, including sensitive communities and species. Impact categories include direct physical impacts, noise and other disturbance, and habitat alteration. Potential issues omitted from discussion in this section include chemical material deposition, water quality alteration, erosion, debris, and electromagnetic radiation effects. Possible indirect effects resulting from migration of explosive material residue and metal contaminants into soil and water resources are discussed in Sections 3.1.2, 3.2.2, and 3.3.2, and are not considered significant to biological resources. Impacts to wetlands and streams and the associated aquatic species due to erosion potential would be minimized by implementing soils-related management requirements (Section 3.2.2). Other debris (litter and refuse) generally should be removed by the user group and is not anticipated to affect biological resources. Radar use on TA A-73, which produces

electromagnetic radiation, is conducted in compliance with human safety guidelines and is not expected to affect biological resources.

3.4.2.1 No Action Alternative

Direct Physical Impacts

Direct physical impact refers to an animal or habitat being physically struck by munitions, troops, or equipment. Wildlife, including sensitive species, could be struck by bombs, missiles, rockets, and bullets expended on the test areas (sensitive plants would not likely be affected because few specimens have been documented on the test areas). These types of munitions are generally not fired or dropped into streams or wetland areas, and would therefore not significantly affect species associated with wet habitats such as the bog frog, alligator, and snapping turtle. Random strikes would be limited primarily to terrestrial species, including the potential for sensitive species such as the gopher tortoise, indigo snake, burrowing owl, and black bear. The probability of a direct strike is not quantified. However, given that munitions are expended during discreet, non-continuous events and are in many cases directed at specific targets, direct physical impacts would be considered infrequent and would not likely result in population-level effects.

The majority of activities on the test areas involve air-to-ground gunnery. Troop and vehicle movement associated with tactical training and small arms use, although infrequent, is periodically scheduled and presents the possibility of trampling or driving over wildlife. Species such as the black bear, indigo and pine snakes, gopher tortoise, and burrowing owl may be impacted directly. For example, most records of eastern indigo snake occurrence on Eglin AFB are associated with vehicle strikes.

Ground activities typically are conducted on established roads (paved or unpaved), and vehicles must remain on roads unless prior approval is obtained. This would decrease the potential for vehicle strikes, as wildlife would be more easily sighted and avoided on roads than in vegetated areas. Off-road troop movement on foot generally is not considered intensive, and restrictions on certain activities would decrease the likelihood of impacts. Ground-disturbing activities are restricted within approximately 1,500 feet of potential flatwoods salamander habitat (no digging or vegetation cutting) or within 100 feet of bog frog streams (no digging, vegetation cutting, or pyrotechnics/munitions use). Due to the relative infrequency of ground movement on the test areas and the protective measures in place, direct physical impacts to wildlife from troop or vehicle movement is unlikely.

In addition, coordination with 96th Civil Engineer Group/Environmental Planning Section (Eglin Natural Resources Section) is required prior to each test or training event. Range users are instructed in required protocols in the event that a sensitive species is encountered. For example, if an eastern indigo snake or Florida pine snake is sighted, activities would cease and the snake would be allowed to move away from the site before activities resume. Also, depending on the specific activity, a protected species survey may be conducted in the area prior to the event. Surveys would document the presence of sensitive species and would specify any mitigating actions. Owl and gopher tortoise burrows would be marked for avoidance as necessary. Gopher tortoises found in affected areas may be relocated by Eglin Natural Resources Section personnel as necessary in accordance with Florida Fish and Wildlife Conservation Commission Gopher

Tortoise Permitting Guidelines (FWC, 2013). Gopher tortoise surveys would benefit the indigo snake as well, as these snakes may inhabit tortoise burrows.

Noise and Other Disturbance

Noise and other aspects of human presence may disturb wildlife, including sensitive species. Noise is associated with airborne gunnery and ground-based activities. Airborne gunnery noise is produced from the propellant blast of gunnery munitions fired at altitude. Ground-based noise may result from detonations, small arms fire, the impact of gunnery rounds at ground targets, and personnel movement. Noise can cause numerous responses in animal species. Effects can range from behavioral reactions such as startle/flushing response, cessation of normal activities, and avoidance of an area, to long-term effects on reproduction. Biochemical reactions can include the production of stress hormones. Human presence and general activities may deter animals from an area on a short-term or long-term basis.

Potential noise impacts to wildlife associated with Alternative 1 were analyzed in the *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 Final Programmatic Environmental Assessment* (U.S. Air Force, 2004), and are summarized here. Although noise could affect a variety of wildlife, including numerous sensitive mammal and bird species (Florida black bear, American kestrel, etc.), impacts to the RCW were considered to be of primary concern. The potential for impacts to reptile and amphibian species is probably less due to differing hearing ability and mechanisms. In addition, species such as the flatwoods salamander spend a large majority of time underground, where noise would be attenuated. The maximum safe noise exposure level for humans without ear protection is 140 decibels (dB) of unweighted peak sound pressure level (SPL) (dBP); due to the absence of any specific threshold for RCWs, this threshold is considered conservative and reasonable for estimating potential noise impacts to the species. A more impactive level of 154 dBP was included in analyses as well.

The largest munition used on each test area was analyzed relative to these metrics. Overall, noise impacts to RCWs would not be considered significant. The largest ordnance currently used on test area A-79 is a 40-pound C4 charge (in the past, live Mk-82 bombs were used and had a substantially greater impact area; this ordnance is no longer used and consultation with the USFWS would be necessary before reinitiating use). Provided C4 detonations are conducted near the same location as analyzed in U.S. Air Force (2004), no active RCW trees would be impacted by noise levels of 140 dBP, although some forage habitat could be affected. For test areas A-77 and A-78, the worst-case scenario of 25-pound rockets fired at the targets closest to RCW trees was analyzed. Up to 22 RCW cavity trees could be impacted by the 140 dBP noise level, but no trees would be exposed to the 154 dBP level. Rocket use was infrequent at these test areas (six events in four years). At test area B-7, 7-pound gunnery charges were the largest ordnance used, and again were conservatively assumed to be used at the targets nearest RCW trees. Five RCW cavity trees could be exposed to 140 dBP noise levels. Use of 7-pound gunnery is frequent on the test area and the noise it produces is repetitious. Continuous noise at this level injures human ears; conservatively assuming injury level is similar in RCWs (damaged sensory hairs in the ear actually recover more readily in birds than in humans), impacts from the use of this ammunition would be of more concern than the infrequent rocket use on test areas A-77 and A-78. Test area B-75 was not included in the 2004 analysis. However, potential

impacts associated with the largest munitions used on the range (C4, TNT Bare Charges, and .50 cal) are expected to be similar or less than those described for the other test areas.

Gunnery activities may temporarily disturb RCW individuals or populations, and foraging individuals may avoid areas where disturbance is occurring. Pioneering RCWs may be affected by noise from daily operations and not colonize or immigrate to new areas within the test site or access roads. This could affect the growth of the RCW population adjacent to the proposed activity area. However, as reported in U.S. Air Force (2004), no difference in group size or behavior of RCWs has been observed across Eglin AFB near test areas versus areas without gunnery operations. RCWs on Eglin AFB have demonstrated a degree of adaptability to noise and probably have become habituated to the noise of munitions at least to some extent, and continue to nest successfully in close proximity to the test areas. Suitable habitat appears to outweigh any negative influences associated with noise. RCWs exposed to noise may exhibit reactions such as a startle reflex or temporary nest flushing, but significant population-level effects are not anticipated. Consultation with the USFWS regarding air-to-ground gunnery on test areas A-77, A-78, A-79, and B-7 (U.S. Air Force, 2004) concluded that noise associated with munitions use was not likely to adversely affect RCW individuals or populations. However, it may be necessary to consult for noise impacts if detonations are repetitively conducted at locations near the same RCW trees, thereby potentially exposing the same individuals frequent disturbance. Such a determination would be made through the Eglin Natural Resources Section's review of specific activities.

In addition to gunnery noise, RCWs and other wildlife could be disturbed by human presence and associated disturbance, including vehicle use. Potential exists for noise impacts to sensitive bird and other species resulting from troop and vehicle movements; however, ground movement is minimal in these test areas due to UXO contamination. Troops generally stay within the confines of the test areas in permitted times and places, and RCW cavity trees are present only on A-77, A-78, and B-75. Movement between test areas is infrequent and involves low to moderate personnel movements. Therefore, no impacts to sensitive communities located near the sites are anticipated. Ground movements may disturb species on the test areas on an intermittent, temporary basis. Startle or flushing reactions may occur, and individuals may avoid areas of frequent use. However, no significant population-level impacts are anticipated from these transient activities.

Habitat Alteration

A habitat refers to the ecological and geomorphological components, such as vegetation, soil, topography, and water, that support wildlife species. Habitat alteration in this analysis includes burrow collapse and wildfire. The burrows of species such as the gopher tortoise and Florida burrowing owl could be crushed or otherwise damaged by air-to-ground and ground-to-ground ordnance, and troop and vehicle movement. Gopher tortoise burrows support other commensal species such as the protected eastern indigo snake. The probability of ordnance striking close enough to a burrow to cause damage or collapse is not quantified, but is considered low because projectiles typically are directed toward specific targets as opposed to random distribution on the test areas. Therefore, only burrows near targets would typically have the potential to be affected. Vehicles, especially tracked vehicles, have the potential to collapse burrows. However, because vehicles are primarily kept on established roads, the possibility of impacts is reduced and

considered minimal. 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 incidental impacts would be less severe than those caused by ordnance and vehicles. In addition, troop movement off of established roads is relatively low in frequency and intensity.

The use of munitions and pyrotechnics increases the risk of wildfires. In general, fire is beneficial to the longleaf, open grassland, and flatwood communities found on Eglin AFB, including the affected test areas. These habitats require frequent fire to maintain the grassy understory and to prevent midstory encroachment. Overall, fire would be primarily beneficial to burrowing owls, RCWs, gopher tortoises, gopher frog ponds, and potential flatwoods salamander habitat. For the RCW, fire maintains the native groundcover that supports prey items, and also hinders predator access to cavities by decreasing midstory encroachment. To maintain high quality RCW foraging habitat, prescribed fire is periodically implemented in active RCW clusters using Eglin AFB's fire prioritization model. Fire crews prepare all active RCW cavity trees in prioritized burn blocks to reduce the potential for fire damage, and a trained RCW monitor is present during all prescribed burns.

Wildfires, while beneficial in some cases, may in others have negative effects on habitats and species, particularly under dry or windy conditions. Wildfires can cause damage to sensitive habitats if they burn too hot, smolder, or if fire suppression activities are necessary. Wildfires have the potential for hydrologic alteration of flatwoods salamander and gopher frog habitat from fire suppression activities, and for damage or mortality of active RCW cavity trees if the trees ignite. RCWs are found on or near all the test areas, and while impacts to cavity trees on the ranges are of some concern, military operations have the potential to impact cavity trees outside the immediate training area via catastrophic wildfires that escape the range boundary. Through the use of live ammunition and incendiary devices, wildfires are frequent occurrences. Between 1997 and 2012, activities on these test areas have been responsible for starting 232 wildfires affecting over 123,000 acres. Although many of the fires are contained to the test area, some percentage has moved into the interstitial area beyond the test area boundary. Evaluation of RCW cavity tree mortality during the five-year period from 1998 to 2002 illustrates the potential for impacts. During this time, a total of 189 active and 681 inactive cavity trees were within areas burned (but not necessarily damaged) by wildfires started by Air Force missions on the test areas of concern. A total of 119 of these cavity trees died during that time from various causes. Analysis suggests that up to 55 percent of the mortality could have been caused by fire. Nighttime wildfires do not tend to burn as hot due to higher humidity and lower winds, thus reducing the likelihood of tree ignition. However, there is an increased risk of harassment for any cavity tree that does ignite at night because RCWs would be roosting.

High quality natural communities, significant botanical sites, and special natural areas occur near or, in the case of TA A-79, on the test areas. Eglin AFB's two largest tracts of old growth longleaf pine are located just east of A-78 and north of A-77, and the Patterson Special Natural Area encompasses several tracts of old-growth immediately adjacent to the north and east of TA A-78. Eglin AFB has documented the steady decline in these communities due to wildfires, wind damage, and prescribed burning. Through research, the conditions to safely prescribed burn old-growth forests have been identified; however, catastrophic wildfire remains the largest single source of old-growth mortality. If catastrophic wildfires continue to occur in these areas, old-growth resources could be negatively impacted.

A recent change in firefighter safely policy has restricted Eglin Natural Resources Section personnel from being present within certain portions of Eglin AFB with high UXO possibility while fire is on the ground. The risk of UXO potentially in or on the ground in these "no suppression" and "restricted suppression" areas was deemed sufficient to require modified burning and suppression tactics to lower UXO explosion potential. Access restrictions limit the ability of firefighters to protect RCW cavity trees within these areas. Traditional direct fire suppression methods, such as plowing firebreaks, are not an option and wildfires in these areas may be very difficult to control. Typically, wildland fire fighting in these areas is confined to block and burn techniques, where suppression teams set counter fires on the network of roads surrounding the ranges. This restriction significantly increases the likelihood that, under adverse conditions, wildfires escaping from the ranges will grow large in size and impact numerous active RCW cavity trees.

A Section 7 consultation was conducted in 2004 to address the potential impacts to RCW cavity trees due to the potential for wildfires to start on test areas A-77, A-78, A-79, and B-7. As a result, in order to minimize damaging wildfires in areas with high wildfire potential, the Natural Resources Section prioritizes most no suppression areas for annual burning. Most of the no suppression areas are near Test Areas A-77, A-78, A-79, and B-7. USFWS concurrence was predicated on Eglin AFB's agreement to follow certain avoidance and minimization measures, including the following:

- Maintain a two-year burn return interval around A-77, A-78, A-79, and B-7 to decrease fire intensity.
- Prepare RCW cavity trees prior to prescribed burning operations.
- Replace any cavity tree damaged by fire to the point it is unsuitable for nesting or roosting with an artificial cavity within 72 hours of the damage.

With management requirements in place, Eglin AFB concluded that habitat alteration due to wildfire is not likely to adversely affect RCW individuals or populations. These requirements would provide protection to other habitats and species as well; significant impacts are not expected due to wildfire.

A comprehensive list of management requirements is provided in Section 5.2. These actions would be required for all alternatives.

3.4.2.2 Alternative 1

Under Alternative 1, Army ground operations would increase, including the introduction of two new vehicle types. This would increase the potential for direct physical impacts and noise disturbance to wildlife, including sensitive species. However, ground operations would occur on existing roads and trails, decreasing the potential for direct strikes. Additional disturbance would increase the potential for harassment compared to the No Action Alternative, but would not be expected to result in significant impacts to wildlife species or populations.

Small arms fire and activities involving small detonations (breach door) would be added to the training capabilities at A-73 and A-79 under this alternative. These activities would increase the

frequency and cumulative level of noise-producing events. Noise associated with these activities may cause startle, flight, or avoidance reactions in wildlife. However, in the context of ongoing training events at the test areas, impacts due to the additional noise would not be significant.

All other potential impacts are the same as those described under the No Action Alternative.

3.4.2.3 Alternative 2

Alternative 2 includes a surge capability of increased testing and training. The types of potential impacts would be similar to those described for the preceding alternatives, but would increase in number and/or frequency. The probability of physically striking wildlife with ordnance, troops, or equipment would increase by an unknown factor; however, munitions use is focused on targets within the cleared target areas, which support relatively limited wildlife resources. It is unlikely that munition strikes would occur frequently. Ground activities typically are restricted to established roads, decreasing the potential for vehicle strikes. Depending on the specific activity, pre-mission surveys may be conducted to document the presence of sensitive species and mark or relocate individuals as necessary.

A surge in test and training activities would increase the amount of expended ordnance used, thereby increasing the frequency for potential noise impacts by an unknown probability. The area of impact would remain similar under this scenario, but the frequency of detonations would increase. An increase in the frequency of activities would likely result in a corresponding increase in disturbance to wildlife, such as startle or flight reactions. In addition, depending on the level of use, wildlife could temporally avoid some test areas or portions of test areas, thereby limiting available habitat. However, relatively large areas of similar habitat are available on Eglin AFB, and wildlife species inhabiting the area are not naïve to noises produced during military activities. RCWs on Eglin AFB have demonstrated a tolerance for mission-related noise. Therefore, impacts would not likely be significant. However, monitoring of RCW populations should be continued in order to detect possible changes in the population that may be related to the increased activities. The analysis provided under the No Action Alternative included worst-case scenarios for charge size and proximity to RCW cavity trees at the time the 2004 EA was prepared. Coordination with Eglin Natural Resources Section is required prior to all test and training events. During coordination, if Eglin AFB personnel determine that the frequency of noise exposure would result in an unacceptable level of repetitive exposure to particular RCW trees, modification of mission location or consultation with the Service may be necessary.

Increased vehicle and troop movement potentially could create noise and disturbance that could affect RCWs. However, due to UXO contamination, ground movement is minimal on all of the test areas. Similar to the No Action Alternative, no significant impacts are anticipated from ground movements.

The potential for habitat alteration would increase by an unknown factor under Alternative 2. Owl and gopher tortoise burrows could be collapsed or damaged due to ordnance use and vehicle and troop movement. The probability of ordnance striking a burrow is low, even with increased munitions use, because projectiles are directed toward targets. Vehicles are generally kept on established roads, and troop movement in the test areas is relatively infrequent.

The primary concern with habitat alteration under Alternative 2 would be the potential for increased wildfire frequency, particularly as it relates to RCW tree impacts. Wildfires have occurred frequently in the past as a result of mission activities, and recent restrictions on firefighting activities in areas with UXO concerns decrease the ability to contain fires within the test area boundaries. Therefore, it is anticipated that surges in mission activities could increase the number of wildfires on the test areas and the corresponding number of fires moving into interstitial areas. Wildfires that leave the ranges could impact natural vegetative communities, including old growth longleaf pine areas, and burn a substantial number of RCW cavity trees. This could result in mortality or harassment to roosting RCWs if the fire occurs at night. Therefore, wildfire would likely adversely affect RCW trees and Eglin Natural Resources Section personnel would enter into consultation with the USFWS through preparation of a Biological Assessment. The Biological Assessment would contain detailed discussion of wildfire threats and conservation measures.

3.4.3 Management Requirements

A number of management requirements, which are designed to reduce impacts to sensitive habitats and protected species associated with the affected test areas, have been identified during previous analyses and would be included with the Proposed Action. These requirements may decrease the impacts to ESA-listed species and fall under the categories of noise, habitat alteration, and species requirements.

Noise

Management requirements could help reduce noise impacts to sensitive species. Use of targets should be shifted to internally established targets that are away from active RCW cavity trees. This action would reduce the potential for impacts to RCWs. It has been found that haphazardly timed and variable noise creates higher levels of disturbance to wildlife. Therefore, firing activities should occur at regular intervals, when possible.

Adherence to U.S. Army Guidelines (U.S. Army, 2007) would minimize potential noise and disturbance from ground movement activities. An important aspect of the Biological Opinion is the recognition of a 200-foot buffer zone around individual RCW cavity trees and the concurrence regarding the types of activities allowed within the 200-foot buffer that would not result in impacts to RCWs. The Service agreed with the U.S. Army that transient foot traffic within 200 feet of RCW cavity trees would have no effect on RCWs, nor would transient vehicle traffic that stayed on existing roads. Transient activities are defined as those that involve maneuver-type training, have low-intensity human activity, and a short-term (less than two-hour) human presence. Activities that are not allowed within the 200-foot buffer zone include bivouacking and establishing command posts and excavating/digging.

The proponent may be required to mark 200-foot buffer zones around active RCW cavity trees potentially impacted by ground movements. Additionally, military activities that are within or near stands of mature long-leaf pine and scheduled during RCW nesting season (late April–July) should be coordinated with the Natural Resources Section. Monitoring of RCWs should also continue. A complete list of allowed and unallowed activities is provided in Table 3-11.

Table 3-11. Training Activities within RCW Buffer Zones

Maneuver and Bivouac	Allowed
Hasty defense, light infantry, hands and tool digging only, no deeper than 2 feet, 2 hours maximum	Yes
Hasty defense, mechanized infantry/armor	No
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; hardwood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than 2 hours	Yes
Weapons Firing	Allowed
7.62 mm and below blank firing	Yes
.50-caliber blank firing	Yes
Artillery firing point/position	No
MLRS firing position	No
All others	No
Noise	Allowed
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman type devices	Yes
Pyrotechnics/Smoke	Allowed
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil and/or graphite flakes[3]	Yes
Smoke grenades	Yes
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
HC smoke of any type	No
Digging	Allowed
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

Habitat Alteration

The largest potential agent for habitat alteration on and around the test areas is wildfire. Management Requirements that would minimize the potential for catastrophic wildfires near these test areas include the following.

- Follow Eglin Wildfire Specific Action Guide Restrictions for pyrotechnics use by class day; specifically, do not conduct hot missions under class D or E levels as determined by the Wildland Fire Management Program at Jackson Guard.
- Through Jackson Guard, have sufficient resources (i.e., fire management personnel and equipment) available to respond to fire emergencies.
- Maintain graded road grid around gunship ranges to facilitate suppression in the event of a wildfire ignition.
- Use Eglin AFB's burn prioritization model to increase the prioritization of prescribed fire at the test areas, so that an approximately two-year burn interval is maintained around all these ranges to reduce hazardous fuel accumulations.
- Per the Eglin Wildfire Specific Action Guide, establish post-mission fire watch of 20 to 30 minutes to search for smoke/fire from mission activities, unless otherwise directed by Jackson Guard.
- Immediately notify Eglin Fire Department Dispatch of any wildfire started as a result of gunnery missions.

Management Requirements Specific to Red-cockaded Woodpecker Habitat

Wildfire impact to RCW cavity trees is the biggest threat to RCW recovery in the areas surrounding TAs A-77, A-78, A-79, and B-7. In addition to the fire Management Requirements listed above, implementation of these Management Requirements would be expected to minimize RCW cavity tree mortality.

- Prep RCW cavity trees before prescribed burns.
- When monitoring RCW cavity trees adjacent to these ranges, record cause of mortality.
- Replace any cavity tree damaged by fire to the point that it is unsuitable for nesting or roosting with an artificial cavity within 72 hours of the damage according to the *Eglin Air Force Base Integrated Natural Resources Management Plan Biological Opinion* from the USFWS. This will be accomplished by one or a combination of 1) retaining a contractor to install the artificial inserts, 2) partnering with the Gulf Coast Plain Ecosystem Partnership to install the artificial inserts, and 3) training Eglin Natural Resources Section personnel to install the artificial inserts.

An Eglin AFB study looking at RCW cavity tree mortality found that mortality was nearly three times as high in unprepared trees versus prepared trees, so the Management Requirements above focus on prescribed burning and preparing cavity trees, which would decrease mortality. Implementation of the general fire Management Requirements would decrease catastrophic wildfires on and around the test areas, benefiting RCWs by decreasing the potential for hot fires

that kill cavity trees. These Management Requirements are anticipated to decrease impacts to RCW cavity trees from wildfires.

Management Requirements Specific to Flatwoods Salamander Habitat

The introduction of fire Management Requirements would likely decrease the frequency of wildfires and increase the frequency of prescribed fire. For flatwoods salamander habitat around these test areas, the most important thing is that fire is introduced frequently, whether it is wildfire or prescribed fire. However, prescribed burning under more controlled and monitored conditions is preferred by 96 ABW/EMSN for habitat maintenance. Implementation of fire Management Requirements would reduce potential impacts to flatwoods salamander habitat.

Species Requirements

Additional species-specific management requirements are provided in EAFBI 13-212 for the following species: reticulated flatwoods salamander, eastern indigo snake, gopher tortoise and burrow, Florida black bear, gopher frog, Florida bog frog, and burrowing owl. Refer to the document for specific information.

3.5 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious, or other reasons. 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 (National Register) maintained by the Secretary of the Interior. Eglin AFB is required to comply with a wide range of federal laws, regulations, and EOs. AFI 32-7065, *Cultural Resources Management*, outlines proper procedures for cultural resources management at Air Force facilities.

The analysis of cultural resources is mandated or guided by a host of federal laws, rules, and regulations. Foremost among cultural resources compliance laws is the NHPA of 1966, as amended. Under NHPA, the Air Force is required to consider the effects of its undertakings on historic properties listed or eligible for listing in the National Register, and to consult with interested parties regarding potential impacts. The National Register, authorized under the NHPA of 1966, is the United States' formal listing of cultural resources considered worthy of preservation. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

All site-specific data, survey information and supporting Florida State Historic Preservation Office consultation data from this document can be reviewed by approval of the Base Historic Preservation Office at 96 CEG/CEVSH (CRIMS, 2013). Additional background information regarding cultural resources policies and history can be found in Appendix G of this document.

3.5.1 Affected Environment

The Area of Potential Effects (APE) outlines the region affected by proposed activities for cultural resources under this alternative. For the proposed action, the APE is defined by the outer boundaries of ranges where proposed air-to-ground gunnery activity is to occur. National Register–eligible buildings and structures within 0.5 mile of the Range boundaries are also presented as part of the APE, as noise and overpressure effects from munition detonation have the potential to travel outside the boundaries of the ranges under consideration. Any directly or indirectly related increases in movement or training occurring outside of these range areas is considered outside of the APE and is part of the *Interstitial Areas Range Environmental Assessment* currently being updated by Eglin AFB. The affected environment for each test area is presented below (CRIMS, 2013; U.S. Air Force, 2010b; U.S. Air Force, 2004).

A-73

No archaeological sites are located within TA A-73. Five sites considered National Register–eligible are located outside of the boundaries but within 0.5 mile of TA A-73 (Table 3-12). Archaeological surveys have been completed within the boundaries of A-73. No historic structures, historic districts, historic cemeteries, or traditional cultural properties (TCPs) have been identified within this test area. To date, Eglin AFB has not performed studies to identify TCPs.

Table 3-12. Archaeological Sites Located in the Vicinity of Test Area A-73

Site #	Eligibility for National Register of Historic Places	Comments
8OK170	Potentially eligible	Prehistoric Weeden Island
8OK171	Eligible	Historic Turpentine Still
8OK1733	Potentially eligible	Prehistoric Weeden Island
8OK1734	Potentially eligible	Prehistoric Weeden Island/Deptford
8OK1831	Potentially eligible	Historic 20th Century Portable Sawmill

Source: CRIMS, 2013

A-77

No archaeological sites have been identified in TA A-77. Two potentially eligible sites, 8SR2150, and 8SR2151, both historic sites, are located well outside of the test area boundaries. All archaeological surveys have been completed within TA A-77. No historic structures, historic districts, historic cemeteries, or TCPs have been identified within these areas.

A-78

No archaeological sites have been identified in TA A-78. One potentially eligible prehistoric site, 8OK02671 is located well outside of the test area boundaries. All archaeological surveys have been completed within the boundaries of TA A-78. No historic structures, historic districts, historic cemeteries, or TCPs have been identified within these areas.

A-79

Test Area A-79 contains archaeological sites considered potentially eligible or eligible to the National Register. Within the test area and also within 0.5 mile of TA A-79 are nine National Register–eligible or potentially eligible resources. Six of these sites are associated with historic homesteads or potentially related historic components, and three have been identified as

prehistoric sites. Table 3-13 provides a summary of the known historic properties associated with TA A-79. No historic districts, historic cemeteries, or TCPs have been identified within these areas.

Table 3-13. Archaeological Sites Located within 0.5 Mile of Test Area A-79

Site #	Eligibility for National Register of Historic Places	Comments
8SR1333	Eligible	Historic homestead.
8SR1515	Potentially eligible	Harvell or Coleman homestead with evidence of three possible structures.
8SR1531	Potentially eligible	Harvell or Barlow homestead with brick concentrations – part of the community.
8SR1532	Potentially eligible	Historic 20th Century
8SR1541	Potentially eligible	Harvell or Wells homestead, artifact concentrations containing structural remains.
8SR1562	Potentially eligible	Prehistoric site.
8SR1559	Potentially eligible	Prehistoric site.
8SR1673	Potentially eligible	Prehistoric Late PaleoIndian/ Early Archaic
8SR1674	Potentially eligible	Historic 20th Century Homestead

Source: CRIMS, 2013

B-7

No known National Register–eligible historic or archaeological sites have been identified within or in the immediate vicinity of TA B-7. The test area has been surveyed for cultural resources. No historic structures, historic districts, historic cemeteries, or TCPs have been identified within these areas.

B-75

All areas are considered surveyed for cultural resources within TA B-75; as a result, additional survey is not required on TA B-75. No historic districts, historic cemeteries, or TCPs have been identified within this test area.

Located 0.5 mile from the southern boundary of TA B-75 is the Protective Aircraft Shelters Historic District (8SR01895) within TA B-12. This historic district consists of 11 Cold War–era targets that remain on the Range, including 8 dummy aircraft shelters (hangars 1–4, 6, 7, 9, and 10), and 3 replica shelters (hangars 5, 8, and 11). The district was nominated under Criterion A for significant events and is unique on Eglin AFB due to the shelters' orientation along the taxiway. These structures were used notably for weapons testing during the Cold War and as a training site for Operation Just Cause in 1989. The hangars are in relatively good condition with only minor damage from past testing reported (CRIMS, 2013; Weitze, 2005).

Five National Register–eligible or potentially eligible archaeological sites are located within or near the boundaries of TA B-75. Of these sites, three sites are eligible for listing on the National Register, and two sites are potentially eligible for listing on the National Register (Table 3-14).

Table 3-14. National Register of Historic Places Eligible Sites Located Within 0.5 Mile of TA B-75

Site Number	Eligibility for National Register of Historic Places	Comments
8OK276	Eligible	Historic homestead sites associated with the turpentine industry
8OK277	Eligible	Historic homestead sites associated with the turpentine industry
8OK1053	Eligible	Historic period artifact scatter
8OK2242	Potentially Eligible	Historic site.
8OK2841	Potentially Eligible	Historic Late 19th Early 20th Century site
8OK2872	Potentially Eligible	Historic Late 19th Early 20th Century site

Source: CRIMS, 2013

Eight structures are located within TA B-75 or within 0.5 mile of the test area boundary (Table 3-15). One structure evaluated as eligible for listing on the National Register, the Metts MC-40 Observation Tower, is located outside of the test area. The remaining seven of these structures are individually considered ineligible for the National Register. However, due to these structures' association with the Cold War, a significant period and significant events in U.S. history, they must be evaluated collectively, and any demolition, renovation, or heavy modification of these buildings must be vetted prior to such modification through 96 CEG/CEVSH.

Metts Cemetery, a historic and protected cemetery, is located outside of the boundaries of TA B-75, near the southeast corner of the range.

Table 3-15. Historic Structures Located Within TA B-75

Site #	Facility ID #	Name	Time Period	National Register Status
8OK01344	1070	Metts MC-40 Observation Tower	1930	Eligible
8OK01935	9400	Range Control House	1957	Ineligible
8OK01937	9403	Spotting Tower B-127	1956	Ineligible
8OK01938	9405	Gap Filler Radar Station	1957	Ineligible
8SR01664	9406	Spotting Tower B-128	1956	Ineligible
8OK01939	9408	Instrument Station	1957	Ineligible
8OK01941	9410	Spotting Tower	1956	Ineligible
8OK01942	9411	Spotting Tower	1956	Ineligible

Source: CRIMS, 2013

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

The No Action Alternative would continue currently occurring activities and would not adversely affect cultural resources. Environmental consequences expected and unintended discovery procedures would be similar to those proposed in Alternative 1. Should ground-disturbing activities beyond the currently approved mission occur, 96 CEG/CEVSH should be contacted to provide guidance to avoid direct physical impact to identified cultural resources or areas where the potential exists to encounter subsurface cultural resources.

3.5.2.2 Alternative 1

No adverse impacts to cultural resources are expected with implementation of all recommended policies and procedures discussed herein.

Potentially eligible and National Register–eligible sites exist on TA A-79 and near the boundaries of B-75. These sites must be protected through avoidance by fencing, marking, or some other means. Maps indicating the locations that need to be avoided and protected are available for review through the AF 813 website. Should avoidance of these resources not be possible, additional consultation with 96 CEG/CEVSH would be required to determine if additional testing, data recovery, or another form of mitigation is required. Until a Range area is free of concern from impacts to cultural resources, guidance for project issues related to cultural resources will be addressed under the procedures of 36 CFR 800 and applicable portions of Eglin's *Integrated Cultural Resources Management Plan* (ICRMP) (U.S. Air Force, 2006a). The Air Force will determine any future adverse effects to historic properties (36 CFR 800.16(l)(1)) and work to consult and resolve those adverse effects.

Metts Cemetery, a historic and protected burial site, is located outside of the boundaries of TA B-75, near the southeast corner of the range. This site must be avoided if ground-disturbing activities are planned.

For all of the test areas, location-specific cultural resource information is sensitive, and 96 CEG/CEVSH should be consulted on a need-to-know basis. The danger of direct physical impact to unknown cultural resources is always a possibility, and standard operating procedures provided for in the Eglin AFB ICRMP would be adhered to should unintended discovery of cultural resources occur (U.S. Air Force, 2006a). In the event that unknown cultural resources are discovered during a mission activity, all activity in the immediate vicinity must cease until the Base Historic Preservation Officer and 96 CEG/CEVSH have been notified and a determination of significance has been rendered. Also, as these site lists and survey areas are being updated continuously, consultation with 96 CEG/CEVSH is required to obtain the latest information for any ground-disturbing activities that might impact these areas.

Continued maintenance and upkeep of existing structures in B-75 is required. If modification or demolition of facilities were to occur, the existing Cold War-era structures will require additional consideration. All actions must adhere to standards and guidelines outlines in the Eglin AFB ICRMP (U.S. Air Force, 2006a) and the previously developed Programmatic Agreement between the AAC, the Florida SHPO, and the Advisory Council on Historic Preservation (U.S. Air Force, 2003b). A copy of the 2003 Programmatic Agreement is located in Appendix G of this document.

Adverse effects to structures at B-12 or to Metts Tower are not expected as a result of Alternative 1. The historic district and the Tower are both located approximately 0.5 mile from the boundaries of the nearest test areas discussed in this document (B-75).

Previous studies conducted by the mining industry regarding explosion-related noise and vibration effects on structures have found that for significant detonations, ground-borne vibration was the primary cause of building vibration if the building was located less than 500 feet from the detonation point. At distances greater than 500 feet, airborne sound waves became the

primary cause of vibration. Other related studies have determined that a level of 175 dBP (peak decibels) is the minimal amount of noise required to cause damage to a lightweight superstructure (U.S. Navy, 2010).

As part of a study conducted by the U.S. Navy in 2009, large-caliber guns (5-inch) were fired with high explosive (HE) shells, and the noise impacts on National Register–listed structures were studied, some located less than 0.5 mile off the firing range. All peak airborne noise levels measured during testing were below 134 dBP, which is considered the threshold for glass and plaster crack damage in stressed or deteriorated structures. It was determined that the potential for structural damage impacts at these historic structures from vibrations was minimal (U.S. Navy, 2010).

Due to the B-12 Historic District's and Metts Tower's distance from current and proposed test and training activities and the construction materials utilized for the hangars, it is unlikely that peak noise and associated vibration levels from these activities would be vigorous enough to cause damage to these historic structures.

3.5.2.1 Alternative 2

Impacts to cultural resources would be nearly identical to those proposed under Alternative 1. As described under Alternative 1, with avoidance of known sites and structures, no adverse effects to cultural resources would be expected under the increase in activities under Alternative 2.

Although the likelihood of direct or indirect impacts to cultural resources on the Range is remote under Alternative 1, the probability of damaging subsurface or structural cultural resources would increase by an unknown amount with the proposed surge capability increase in activity associated with Alternative 2. Expended munitions are focused on hitting targets within the cleared target areas, which are essentially barren areas lacking intact resources. It is extremely unlikely that munitions would directly impact any cultural resources on the ranges or outside of the boundaries of the ranges if management requirements for cultural resources are followed. Should monitoring of these areas by cultural resource personnel show that direct or indirect impacts are likely to occur from future increases in activities, additional consultation and mitigation may be required.

3.6 AIR QUALITY

3.6.1 Affected Environment

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants generally are expressed on a concentration basis in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards (see Appendix B). 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 USEPA designates whether areas of the United States meet the NAAQS. Those areas demonstrating compliance with the NAAQS are considered "attainment" areas, while those that do not demonstrate compliance are known as "nonattainment" areas. Those areas that cannot be classified on the basis of available information for a particular pollutant are "unclassifiable" and are treated as attainment areas until proven otherwise.

Greenhouse Gases

The six primary greenhouse gases (GHGs) are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Only emissions of CO_2, CH_4, and N_2O need to be considered in this EA.

Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth's surface. To allow GHGs to be compared to each other, each GHG quantity is translated into a common unit called the "carbon dioxide equivalent" (CO_2e).

There are no established thresholds or standards for greenhouse gases, but in draft guidance issued February 18, 2010, the Council on Environmental Quality (CEQ) suggested that proposed actions that are reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2e should be evaluated by quantitative and qualitative assessments.

Region of Influence and Existing Conditions

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, normally a year. These annual rates typically are represented in tons per 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. Accurate inventories are imperative for the development of appropriate air quality regulatory policy.

The most recent air emissions inventories for Eglin AFB quantify emissions from stationary and mobile sources based on calendar year activities. Stationary sources include equipment/processes such as boilers, electric generators, surface coating, and fuels handling operations. Mobile sources include motor vehicles, aerospace ground support equipment, and aircraft operations.

For comparison purposes, Table 3-16 presents the USEPA's 2008 National Emissions Inventory (NEI) data for Okaloosa and Santa Rosa Counties (USEPA, 2012b). The county data include emissions data from point sources, area sources, and mobile sources. Point sources are stationary sources that can be identified by name and location. Area sources are point sources 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 gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and non-road. On-road mobile sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Non-road sources are aircraft,

locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2011).

Table 3-16. Baseline Emissions Inventory for Okaloosa and Santa Rosa Counties

	Emissions (tons/year)				
	CO	NO_x	PM	SO_x	VOC
Total Okaloosa County	63,375.36	8,434.91	6,204.55	384.28	39,342.36
Total Santa Rosa County	47,857.75	6,821.06	7,892.06	750.99	36,991.78
Total Region of Influence	111,233.11	15,255.97	14,096.60	1,135.27	76,334.14

Source: USEPA, 2012b

CO = carbon monoxide; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compounds

In order to evaluate air emissions and their impact on the overall ROI, the emissions associated with the project activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 2008 NEI data.

Potential impacts to air quality are identified here as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent criterion approach was used in the USEPA's General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. The USEPA made revisions to the General Conformity Regulations on March 24, 2010. These final revisions remove the requirements for federal agencies to conduct conformity determinations for "regionally significant" actions. Such actions have emissions greater than 10 percent of the emissions inventory for a nonattainment area. However, this criterion will still be used in this analysis for the purposes of discussion and comparison. Emissions from activities on test areas will also be compared to the federal NAAQS.

Greenhouse Gas Inventories

Currently there is no GHG inventory for the three-county ROI. The existing inventories are for the entire state and for Eglin AFB. Table 3-17 shows the total CO_2e data that are currently available at the time of this EA.

Table 3-17. Greenhouse Gas Inventory Totals

Location	GHG Emissions (tons/year)
State of Florida[1]*	371,039,926
Eglin AFB[2]**	914,894

CO_2e = carbon dioxide equivalent; CY = calendar year; FY = fiscal year; GHG = greenhouse gas

Source: [1]Strait et al, 2008; [2]U.S. Air Force, 2011.

*Total CO_2e for CY 2005

**Total CO_2e for FY 2010

3.6.2 Environmental Consequences

Air quality is evaluated using a 10 percent threshold of Okaloosa and Santa Rosa County emissions. Emissions are also compared to the NAAQS to verify air emissions are not exceeding federal levels. Air emissions were calculated based on a representative munitions for each expenditure category (i.e., bombs, countermeasures, rockets, etc.) and the total quantity of expenditures expected for each alternative multiplied by the net explosive weight (NEW) and the appropriate emission factors. Also included in the analysis was emissions from vehicle use, and fugitive dust from unpaved roads.

3.6.2.1 No Action Alternative

Under the No Action Alternative, the baseline emissions represent the previously approved level of activity from the 2004 *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004) and the 2010 *TA B-75 REA, Revision 1* (U.S. Air Force, 2010b). Table 3-18 summarizes the munitions and vehicle use emissions compared with the ROI, while Table 3-19 shows the emissions compared with the NAAQS. Emissions are below the federal standards and the 10 percent threshold. The highest percentage is from PM emissions, with only a 3 percent increase to region PM emissions from test area activities. The majority (96 percent) of the PM emissions come from the use of rockets on TA B-75. No impacts to air quality are expected for the No Action Alternative.

Table 3-18. Air Emissions for the No Action Alternative Compared to Okaloosa and Santa Rosa Counties

Category	Emissions (tons/year)					
	CO	NO_x	PM	SO_x	VOCs	CO_2e
Total Okaloosa County	63,375.36	8,434.91	6,204.55	384.28	39,342.36	--
Total Santa Rosa County	47,857.75	6,821.06	7,892.06	750.99	36,991.78	--
Total Region of Influence	111,233.11	15,255.97	14,096.60	1,135.27	76,334.14	--
Test Area Emissions	25.91	4.65	438.38	0.36	0.70	116.25
% Regional Emissions	0.02%	0.03%	3.11%	0.03%	0.00%	--

CO=carbon monoxide; NOx=nitrogen oxides; PM=particulate matter; VOC=volatile organic compound

Table 3-19. Air Emissions for the No Action Alternative Compared with the NAAQS

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	3.401E-06
	8-Hour	9	2.381E-06
NO_x	Annual	0.053	4.602E-08
SO_2	3-Hour	0.5	3.475E-08
	24-Hour	0.14	1.545E-08
	Annual	0.03	3.089E-09
PM_{10}	24-Hour	150 ug/m³	48.51
	Annual	50 ug/m³	9.70

NAAQS = National Ambient Air Quality Standards; ppm=parts per million; CO=carbon monoxide; NOx=nitrogen oxides; PM=particulate matter; VOC=volatile organic compound

Emissions of GHGs are from vehicle use and munitions (Table 3-18). For the No Action Alternative, these emissions (116 tons CO_2e per year or 105 metric tons per year) are well below the 25,000 metric tons CO_2e threshold for detailed analysis. No adverse impacts are expected.

3.6.2.2 Alternative 1

This alternative would approve current and foreseeable future use of expenditures. The increase in expenditures would cause a slight increase in emissions to the air but would not exceed the 10 percent threshold (Table 3-20) or federal standards (Table 3-21). As in the No Action Alternative, the pollutant with the highest concentration is PM (3 percent of the regional emissions). The majority of these emissions come from rockets used on B-75. Emissions are not expected to have adverse effects on air quality for Alternative 1.

Table 3-20. Air Emissions for the Alternative 1 Compared with Okaloosa and Santa Rosa Counties

	Emissions (tons/year)					
	CO	**NO_x**	**PM**	**SO_x**	**VOCs**	**CO_2e**
Total Okaloosa County	63,375.36	8,434.91	6,204.55	384.28	39,342.36	--
Total Santa Rosa County	47,857.75	6,821.06	7,892.06	750.99	36,991.78	--
Total Region of Influence	111,233.11	15,255.97	14,096.60	1,135.27	76,334.14	--
Test Area Emissions	32.81	4.83	438.56	0.38	0.70	141.52
% Regional Emissions	0.03%	0.03%	3.11%	0.03%	0.00%	--

CO=carbon monoxide; NOx=nitrogen oxides; PM=particulate matter; VOC=volatile organic compound

Table 3-21. Air Emissions for the Alternative 1 Compared with the NAAQS

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	3.401E-06
	8-Hour	9	2.381E-06
NO_x	Annual	0.053	4.602E-08
SO_2	3-Hour	0.5	3.475E-08
	24-Hour	0.14	1.545E-08
	Annual	0.03	3.089E-09
PM_{10}	24-Hour	150 ug/m³	48.51
	Annual	50 ug/m³	9.76

CO=carbon monoxide; NAAQS = National Ambient Air Quality Standards; NOx=nitrogen oxides; PM=particulate matter; ppm=parts per million

Emissions of GHGs are from vehicle use and munitions (Table 3-20). For Alternative 1, these emissions are slightly higher than the No Action Alternative (141 tons CO_2e per year or 128 metric tons per year) but are still well below the 25,000 metric tons CO_2e threshold for detailed analysis. No adverse impacts from GHG emissions are expected.

3.6.2.3 Alternative 2

This alternative would authorize the level of activity under Alternative 1 plus a surge in activities. The increase in munitions expenditures would cause an increase in air emissions to the region that would be minor compared with Alternative 1 (Table 3-22 and Table 3-23). Air emissions under Alternative 2 do not exceed federal standards or the 10 percent threshold used in this analysis. Adverse impacts to air quality are not expected under Alternative 2.

Emissions of GHGs from vehicle use and munitions under Alternative 2 are shown in Table 3-22. These emissions are slightly higher than the emissions under Alternative 1 (193 tons CO_2e per year or 175 metric tons per year) but are still well below the 25,000 metric tons CO_2e threshold for detailed analysis. No adverse impacts from GHG emissions under Alternative 2 are expected.

Table 3-22. Air Emissions for the Alternative 2 Compared with Okaloosa and Santa Rosa Counties

Category	Emissions (tons/year)					
	CO	**NO_x**	**PM**	**SO_x**	**VOCs**	**CO_2e**
Total Okaloosa County	63,375.36	8,434.91	6,204.55	384.28	39,342.36	--
Total Santa Rosa County	47,857.75	6,821.06	7,892.06	750.99	36,991.78	--
Total Region of Influence	111,233.11	15,255.97	14,096.60	1,135.27	76,334.14	--
Test Area Emissions	46.19	5.18	439.10	0.40	0.70	193.46
% Regional Emissions	0.04%	0.03%	3.11%	0.04%	0.00%	--

CO=carbon monoxide; NO_x=nitrogen oxides; PM=particulate matter; VOC=volatile organic compound

Table 3-23. Air Emissions for the Alternative 2 Compared with the NAAQS

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1-Hour	35	3.401E-06
	8-Hour	9	2.381E-06
NO_x	Annual	0.053	1.094E-08
SO_2	3-Hour	0.5	3.475E-08
	24-Hour	0.14	1.545E-08
	Annual	0.03	3.089E-09
PM_{10}	24-Hour	150 ug/m³	48.84
	Annual	50 ug/m³	9.76

CO=carbon monoxide; NO_x=nitrogen oxides; PM=particulate matter; ppm=parts per million; VOC=volatile organic compound

3.7 NOISE

As discussed in this section, noise is sound energy that can be intrusive, annoying or harmful to people or wildlife. Effects to people range from interrupting daily activities or sleep, damage to property or in cases of intense or prolonged loud noise result in temporary or permanent loss of hearing. Technical information on noise metrics, and criteria and thresholds that were used in the analysis to support the conclusions in this section are provided in Appendix D.

3.7.1 Affected Environment

The affected environment for noise includes people on and off the range, and protected species on and near the subject test areas. The ROI for noise effects can extend several miles into the surrounding community from the noise source depending on multiple factors, including the action generating the noise and propagating factors such as weather, terrain and density of ground vegetation, which dictate how far the noise travels.

The existing condition with respect to noise around Eglin AFB is characterized by not only military noise, but the daily activities typical for populated areas, notably vehicle traffic and commercial air traffic, but also contributions from natural sources such as wind, waves, weather, and wildlife. Military noise sources most perceptible to the public include fixed and rotary-winged aircraft, sonic booms, and detonations from air-to-ground bombing, and ordnance disposal. The different types of noise are evaluated with different measurements, and have different thresholds used in determining their impacts to people and wildlife.

For the Proposed Action, the populated areas adjacent to the southwestern and northwestern boundaries are considered to be within the ROI of noise generated by activities at the subject test areas. The communities of Holly, Navarre, and Mary Esther, which are situated to the south and southeast of A-73, A-77, A-78 and A-79, are by proximity most likely affected by noise generated from missions at these test areas. However, there have been less than ten noise complaints from these communities since 2002, which accounts for approximately 2 percent of all complaints Eglin AFB received over that time. For actions at TAs B-7 and B-75, the communities of Parker and Harold are considered to be potentially affected by mission noise from those test areas, but there have been no complaints from these communities.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Previous analysis of missions from A-77, A-78, A-79, B-7 and B-75, which is the basis for the No Action Alternative, found no significant impacts from noise to people or wildlife (U.S. Air Force, 2004; U.S. Air Force, 2006) under ideal weather conditions. However, there were areas of incompatible land use from noise impacts, discussed later in Section 3.9 Socioeconomic Resources, and stipulations for avoiding more adverse impacts, such as conducting certain missions only under favorable weather conditions in order to limit the propagation of noise. Analyses of the No Action Alternative focuses on the changes to the affected environment (i.e., communities, wildlife) since the subject test areas were first analyzed.

The different types of noise from activities at the subject test areas have different metrics and impact thresholds, thus warranting a separate discussion for each. Noise sources from the Proposed Action include more or less continuous noise from small arms fire, and impulse or explosive noise from gunnery round detonations, and low flying aircraft. A measure that evaluates multiple detonations over a period of time is used as a means to identify noise levels that may be incompatible with certain land uses and/or cause excessive annoyance with the public. Likewise, continuous noise is averaged over time to determine incompatible noise uses or annoyance to the community. Determination of noise impacts to wildlife is based on scientific measurements of wildlife response to munitions and overflights, anecdotal observations of animal reactions reported in the literature and application of human hearing damage thresholds. Particularly challenging with determining impacts to wildlife from noise is separating other factors that contribute to their reaction to noise, such as human presence or visual disturbance of an aircraft. Analysis of noise impacts to wildlife is addressed in Section 3.4.

Aircraft Noise Impacts

The initial *Air-to-Ground Gunnery PEA* found no significant noise impacts from aircraft. Aircraft activity within the airspace blocks R2915-A and R2915-B associated with the subject test area missions is not sufficient to create average noise levels that result in incompatible land usage. Complaints of low flying aircraft from communities nearest the subject test areas are infrequent and are not always attributable to No Action Alternative missions.

Noise Impacts to the Community

With regard to the different types of single detonations that can occur on the subject test areas, the No Action Alternative would not have significant adverse effects on the community in general, but coordination between the Eglin Safety Office and mission personnel is key to avoid certain weather conditions that may exacerbate noise effects. For single detonations, effects range from startling, annoyance, window damage, and if one were close enough, injury or death. Noise from single event explosive noise is commonly expressed as dBP. Generally, strong winds, cool temperatures, and temperature inversions can result in a worst case scenario for noise impacts to the community. To understand the effect that daily operations of multiple munitions can have, noise from all sources is averaged and expressed as a day-night average (L_{dn}). Thresholds used here are briefly summarized as follows:

- An SPL of 140 dBP has been identified by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) as a maximum recommended unprotected exposure level necessary to prevent physiological damage to the human ear drum (29 CFR Ch. XVII § 1926.52(e)).
- An SPL less than 115 dBP has been shown to cause minimal public annoyance resulting from the noise (U.S. Army, 2001).
- The L_{dn} also sums the individual noise events and averages the resulting level over a specified length of time. Normally, this is a 24-hour period. Public annoyance is often the most common impact associated with exposure to elevated noise levels. "C" weighting is applied to dB measures of impulse sound energy to emphasize those frequencies humans hear best. When subjected to day-night average sound levels of 62 dBC, approximately 12 to 15 percent of persons so exposed will be "highly annoyed" by the noise (Finegold et al., 1994; CHABA, 1981).

The primary factor limiting the degree to which explosive noise travels is the amount of NEW. Each test area may differ in the size of munitions allowed for expenditure. The analysis here considers the munitions that constitute the largest potential detonations, those that are of substantial size that occur with any frequency, and the average annual noise of all missions. The 105mm gunnery round is the largest (7.1 pounds net explosive), most frequently used munitions on TAs A-77, A-78 and B-7. Test Area A-79, though seldom used has a history of occasional static Mk-82 detonations. The Mk-82 (unguided general purpose bomb) has 192 pounds of net explosive of a composition, which is equivalent to 236 pounds of TNT. More frequently expended on TA A-79 are 40-pound blocks of C4 (plastic explosive), equal to about 47 pounds of TNT. NEW inputs to the model used in the analysis, the Noise Assessment and Prediction System, are in TNT equivalents. The potential noise levels and impacts from the No Action Alternative are provided in Table 3-24. Appendix D provides additional detail on the analysis and noise contours are included in Figure 3-9.

Table 3-24. No Action Alternative Noise Impacts

Area	HE Ordnance	Annoyance Threshold Radius (feet) (115 dBP)	115 dBP Extends into Community	62 L_{Cdn} Radius (miles)	62 L_{Cdn} Extends into Community
A-77	105mm, various	Up to7460	No	3.5	Yes
A-78	105mm, various	Up to 7460	No	3.2	Yes
A-79	Mk-82	20,000	Yes	Not calculated	Yes
	40-lb C4	12,430	Yes		
B-7	105mm, various	Up to 7460	No	2.5	Yes
B-75	Various	Up to 22,370	No	Not calculated	Likely

dBP = peak sound pressure; HE = high explosive; L_{Cdn} = C-weighted day/night noise level; mm = millimeter

3.7.2.2 Alternative 1

Alternative 1 would not result in significant noise impacts. In addition to noise sources and impacts discussed under the No Action Alternative, which are included here by reference, additional noise sources at A-73 derive from small arms fire at the firing range and pyrotechnics of up to 4 pounds of C4.

With expenditures of 500,000 rounds of various small arms ammunition annually, the analysis assumes that with about 250 operational days available per year, up to 2000 rounds would be expended per day. The average daily noise from small arms fire for a defined area as shown in Table 3-25 below would not exceed annoyance thresholds beyond the Eglin AFB boundary. Analysis assumed all rounds expended and noise produced to be confined within an area 1,000 feet square. Table 3-25 shows calculated noise dissipation as one moves away from the leading and lateral edges of the square. As can be seen in the table, commonly used annoyance thresholds of noise would not be exceeded beyond 1,000 feet from the A-73 firing range. A visual representation of the noise contours is included in Figure 3-9.

Table 3-25. Alternative 1 Small-Arms Live-Fire Range (2,000 rounds/day)

Distance from Edge of Maneuver Area (Feet)	Noise Levels: Single Operation [$L_{eq(24)}$] C-Weighted	
	Leading Edge	Lateral Edge
500	64.6	64.3
1,000	60.6	60.5
1,500	57.9	57.9
2,000	55.9	55.9
2,500	54.3	54.3

$L_{eq(24)}$ = 24-hour equivalent noise level

The 4 pounds of C4 detonated up to twice per month would not result in annoying levels of noise to the community. The 115 dBP level would extend out to 7,540 feet under calm weather conditions.

3.7.2.3 Alternative 2

Alternative 2 would not result in significant noise impacts either from aircraft noise or ground-based noise impacts to the community. Noise impact from munitions at each of the test areas is summarized in Table 3-26. Noise impacts from the proposed increase in rounds for the small arms range at A-73 are shown separately in Table 3-26 and visually in Figure 3-10.

Table 3-26. Alternative 2 Munitions Noise Impacts

Area	HE Ordnance	Annoyance Threshold Radius (feet) (115 dBP)	115 dBP Extends into Community	62 L_{Cdn} Radius (miles)	62 L_{Cdn} Extends into Community
A-73	4 lb C4	7540	No	Not calculated	Not calculated
A-77	105mm, various	Up to7460	No	5	Yes
A-78	105mm, various	Up to 7460	No	5	Yes
A-79	Mk-82	20,000	Yes	Not calculated	No
	40-lb C4	12,430	Yes		
B-7	105mm, various	Up to 7460	No	4	Yes
B-75	Various	Up to 22,370	No	Not calculated	Likely

dBP = peak sound pressure; L_{Cdn} = C-weighted day/night noise level; HE = high explosive; mm = millimeter

The increase in rounds expended at the firing range at A-73 under this alternative results in approximately 1,000,000 rounds annually. Assuming 250 operational days per year, the daily expenditure would be 4000 rounds. Table 3-27 shows that noise annoyance thresholds of 62 dB

C-weighted day/night noise level (L_{Cdn}) would remain within 1,500 feet of the firing range and not leave the Eglin AFB reservation.

Table 3-27. Alternative 2 Small-Arms Live-Fire Range (4,000 rounds/day)

Distance from Edge of Maneuver Area (feet)	Noise Levels: Single Operation [L_{Cdn}]	
	Leading Edge	Lateral Edge
500	67.6	67.3
1,000	63.6	63.5
1,500	60.9	60.9
2,000	58.9	58.9
2,500	57.3	57.3

L_{Cdn} = C-weighted day/night noise level

3.8 SAFETY AND RESTRICTED ACCESS

The existing safety environment encompasses risk to public health and, with respect to training activities, risk to the health of military personnel and any measures designed to minimize that risk. For actions occurring on military property with inherent safety risks, procedures are in place that minimize or eliminate altogether risks to the public. Such measures include the designation of areas as "restricted" or "closed" to the public, either permanently or temporarily. Such closures are driven by the dimensions of the "safety footprint" of a particular action that may have potentially harmful noise, blast, or other effects, or by the existence of UXO from historical missions. Mission activities that are of potential consequence to restricted access and safety within TAs A-77, A-78, A-79, B-7, and B-75 involve the use of low-level aircraft, live munitions detonations, ground-fired small arms, and the need for area closures to nonparticipating personnel due to large-scale training exercises.

This section presents information concerning the existing range safety conditions at Eglin AFB and the potential safety concerns associated with the Proposed Action.

3.8.1 Affected Environment

Regulatory and Management Overview

The primary regulations that establish relevant safety policy and define requirements and procedures for conducting tests on Eglin AFB and areas under its jurisdiction are found in AAC Instruction 91-201, *Test Safety Review Process*. This guidance is implemented by the AAC Range Safety Office and supporting organizations. The Test Safety Review Process described in AAC Instruction 91-201 implements the Operational Risk Management (ORM) process, as specified in AFI 90-901 for all AAC test programs, and reflects the practical application of ORM as outlined in Air Force Pamphlet 90-902, *ORM Guidelines and Tools*. The steps in the ORM process, as they relate to the Test Safety Review Process are:

A. Identify the hazards. Personnel involved with the test or activity act as a team to identify all potential hazards.

B. Assess the potential risk. Assess the probability and severity of loss from exposure to the identified hazard.

C. Analyze risk control measures. Investigate specific strategies and tools that reduce, mitigate, or eliminate the risk.

D. Make control decisions. Approve the best risk control or combination of controls based on the analysis of overall costs and benefits.

E. Implement risk controls. Once procedures to minimize identified hazards have been determined and approved at the appropriate level, those procedures are implemented during the test.

F. Supervise and review. Continue the ORM process throughout the accomplishment of every test program.

This instruction affects all test operations that are conducted under a 96 TW Test Directive. It includes ground training activities involving personnel, aircraft, equipment, or airspace. It applies to system program managers, program engineers, test engineers, range safety engineers, and aircrews that are responsible for incorporating safety planning and review into the conduct of test and training programs. Safety procedures associated with routine training operations are implemented through the individual organization, based on its specific training protocols/guidance.

Ordnance Use

A number of standard safety procedures exist to ensure limited public access to affected test areas during testing or training activities. These procedures require every practical effort to keep the designated areas clear of all nonparticipating vehicles and personnel. A key part of these procedures includes development of weapon safety footprints, also referred to as surface danger zones (SDZs). SDZs are employed for land-based training where live ordnance is used and act as overlays that restrict activities that could normally occur within and adjacent to test or training areas. In general, for aircraft-launched weapons, as the distance from the weapons release to the target increases, so does the footprint. The same is true for altitude and speed at launch or release; as the launch altitude and/or aircraft speed increases, so does the size of the footprint (U.S. Air Force, 2003a). A buffer zone is typically built into the footprint to further minimize the risk to the public or other resources from the testing of hazardous items on the range.

Unexploded Ordnance

UXO is defined as any munitions device containing explosive material (i.e., live) that did not detonate upon impact with the surface but still has the potential to detonate. UXO is a potential problem across much of the Eglin Range Complex as a result of past mission activities. During its long history, a vast number of different munitions items have been expended throughout the range as part of routine training and special testing activities. While UXO is an unintended, but unavoidable consequence of any operation involving energetic material, only recently has the Air Force published standards for munitions residue maintenance, remediation, and documentation.

Eglin AFB has conducted an archive search in order to document the locations of formerly used ranges but has yet to conduct any basewide assessment of UXO contamination suitable to support an analysis of risk to training units. Previous informal analyses have centered on identifying areas with low enough risk to allow public recreation or to outgrant nonexcess real property. Currently, the AAC Safety Office handles requests on a case-by-case basis and controls the risk by limiting the type, location, or frequency of the requested action based on an

informal risk assessment using local historical knowledge, the USACE Archive Search Report, and the Eglin Reservation Explosives Contamination study from July 1976.

Some areas of Eglin AFB have been classified as clean and do not have access restrictions. These areas either have never been used for munitions and/or the near surface has been checked for the presence of UXO. However, much of the range is considered potentially contaminated with UXO that may have resulted from historical activities (U.S. Air Force, 1998). The test areas are known to have been used for munitions testing and therefore are considered likely to be contaminated with UXO. Therefore, the TAs A-73, A-77, A-78, A-79, B-7, and B-75 are permanently closed to public access (Figure 3-7).

Restricted Access

Restricted access pertains to the temporary closure of areas on Eglin AFB because of mission activities. All or portions of the Eglin AFB reservation are subject to closure during military testing and training activities. The purpose of restricting access to the public during these times is to ensure their safety while maintaining mission integrity. Receptors potentially impacted would include the military and the public desiring to use recreational areas. Guidance for restricted access is utilized to coordinate public and military use of land within the Eglin AFB range. Range areas in use are closed to all forms of public recreation. Areas permanently closed to the public are shown in Figure 3-7.

Prior to entering the Eglin AFB reservation for recreational purposes all individuals are now required to review the Public Access Map (PAM) located at: http://jg.eglinforcesupport.com/#. The PAM is a graphical representation of the daily public access restrictions and provides a three-day forecast of closure information in support of military operations. Recreational access information is also available on a daily basis by calling the Base Information Line, (850) 882-1110. In the event that an unscheduled mission would require immediate closure of public accessible areas then gates, barricades and/or range personnel would be utilized to prohibit access.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Since the types of munitions to be used are the same or similar to the types currently used at TAs A-73, A-77, A-78, A-79, B-7, and B-75, implementation of the No Action Alternative, 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. In the case of the proposed live-fire ranges, personnel exclusion zones and appropriate safety buffers would be developed and implemented. Public access to the test and training 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.

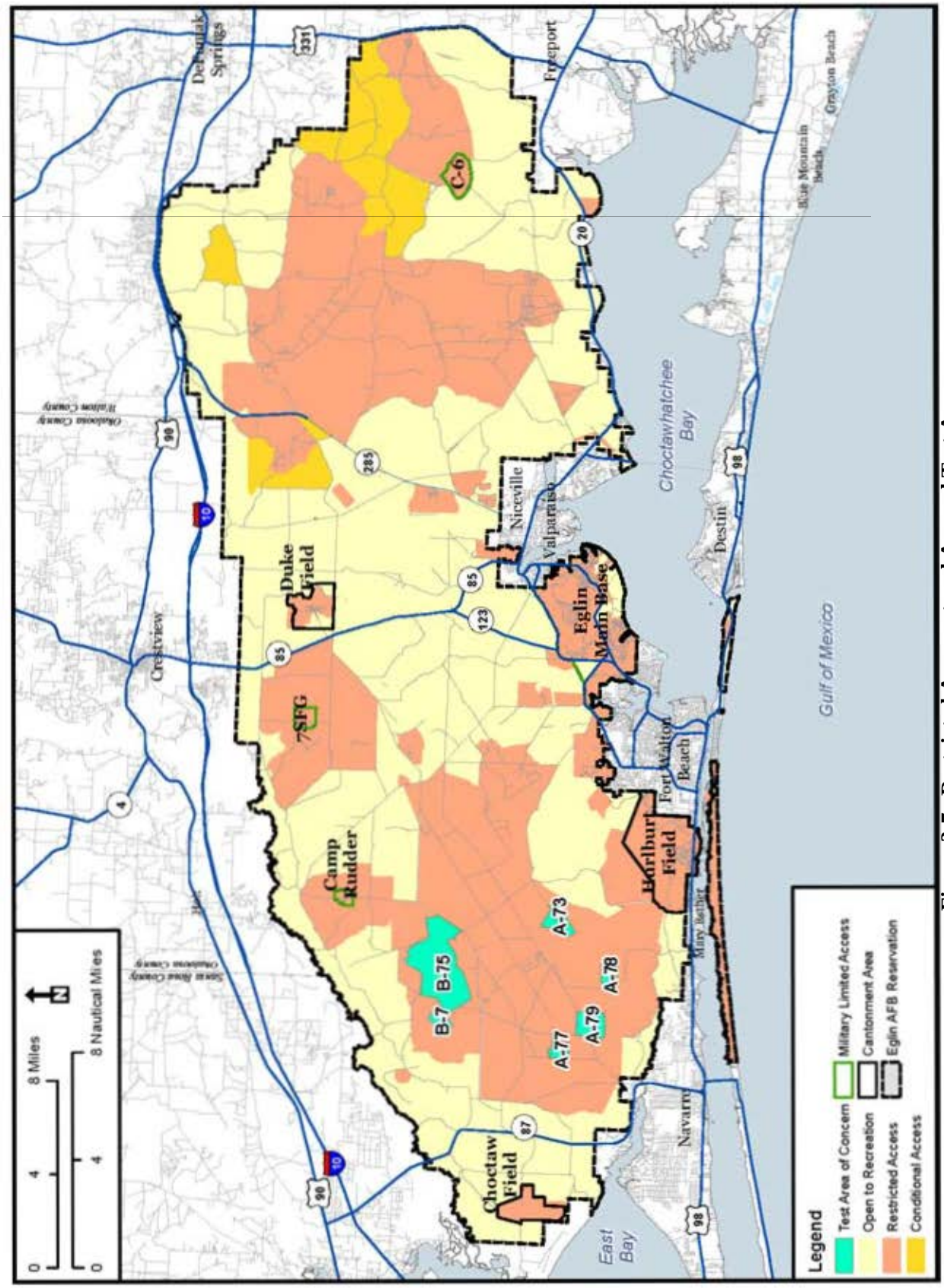

Figure 3-7. Restricted Access at and Around Test Areas

Most areas on the Eglin Range, including TAs A-73, A-77, A-78, A-79, B-7, and B-75, have the potential for UXO contamination. Consultation and coordination with 96th Civil Engineering Squadron EOD Flight (96 CES/CED) would mitigate any potential adverse impacts to Eglin AFB personnel from UXO. Although increases in the frequency of ordnance use would likely lead to increased instances of UXO, the current safety policies and procedures would continue to ensure that there would be no adverse impacts from UXO.

Although test and training areas are closed to all forms of public access, restricted access issues may result due to brief closures of recreational areas that fall within the safety footprint of some missions. However, no significant impacts are anticipated to public access due to the short term and temporary duration of closures, the amount of acreage available on Eglin AFB for recreation, and continued updated advance notification of closures for recreational access planning purposes.

3.8.2.2 Alternative 1

Regardless of increased munitions use, established safety procedures and policies would continue to ensure safety of Eglin AFB personnel, and minimize potential adverse impacts from UXO.

For safety purposes, additional expenditures and activities could result in an increase in more frequent short-term or daily closures in areas open to the public, which potentially could impact recreational users. To minimize potential impacts associated with restricted access, other areas on Eglin AFB would remain open and continued advanced notification of closures would be available for recreational access planning purposes.

3.8.2.3 Alternative 2

Under Alternative 2, potential impacts to safety and restricted access would be similar to those described under Alternative 1.

3.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section discusses the socioeconomic resources that have the potential to be impacted by activities occurring on and surrounding TAs A-73, A-77, A-78, A-79, B-7, and B-75 at Eglin AFB. There are no new personnel anticipated as part of the proposed action that would impact population, employment, or housing. In addition, no socioeconomic impacts are anticipated as a result of temporary or short term restricted access in recreational areas during testing and training. The main issue of concern is the potential for noise impacts generated by live fire which might exceed beyond the base boundaries and into residential areas.

Concern that certain disadvantaged communities may bear a disproportionate share of adverse health and environmental effects compared with the general population led to the enactment in 1994 of EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO directs federal agencies to address disproportionate environmental and human-health effects in minority and low-income communities. In addition, 32 CFR 989, *EIAP*, addresses the need for consideration of environmental justice issues in compliance with NEPA. EO 12898 applies to federal agencies that conduct activities that could

substantially affect human health or the environment. The evaluation of environmental justice is designed to:

- Focus attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice.
- Foster nondiscrimination in federal programs that may substantially affect human health or the environment.
- Give minority communities and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment.

Environmental justice analysis also addresses the protection of children, as required by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (*Protection of Children*), issued in 1997 to identify and address issues that affect the protection of children. According to the EO, all federal agencies must assign a high priority to addressing health and safety risks to children, to coordinating research priorities on children's health, and to ensuring that their standards take into account special risks to children. The EO states "…'environmental health risks and safety risks' mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to.)"

3.9.1 Affected Environment

Environmental Justice and Risks to Children

Table 3-28 lists the percentage of minority, low-income populations, and children (persons under 18 years of age) against the community of comparison (COC) results. The COC values represent the percentages of minority, low-income populations, and children within a geographic extent representing the ROI. Areas where the area of concern (AOC) percentages are greater than the COC percentages are identified as having potential environmental justice concerns. Typically, countywide percentages have been used for the AOC and statewide percentages for the COC. As all activities described in this assessment occur on the western aspect of the reservation, adjacent to Santa Rosa County and Okaloosa County, the county COC percentages are important to this analysis.

Table 3-28. Minority/Low Income Comparisons with COC (2010 Census)

	Minority %	Low-Income* %	Persons Under 18 years %
Santa Rosa County	15.0	11.3	23.9
Okaloosa County	22.9	10.6	22.3
Total (AOC)	19.3	10.9	23.0
Florida (COC)	42.1	13.8	21.3

Source: U.S. Census Bureau 2010a, 2010b
AOC = area of concern; COC = community of concern
*Values based on estimates derived between 2006–2010

A more specific method of evaluating environmental justice concerns is by looking at specific socioeconomic conditions of Eglin AFB's surrounding communities. This targeted approach

follows the general guidelines presented in *The Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP)* (U.S. Air Force, 1997).

GIS mapping was used to conduct targeted analyses. The AOC consisted of each individual block level (minority) or tract level (low-income) within the counties that are adjacent to Eglin AFB. The COC consisted of the overall percent minority and percent low-income of Santa Rosa County and Okaloosa County. The resulting data were divided into four distinct categories: areas with no environmental justice concerns, areas with minority concerns, areas with low-income concerns, and areas with both minority and low-income concerns. Additionally, water bodies and census blocks with zero population were filtered out and identified as areas with no environmental justice concerns. The results are mapped in Figure 3-8. This map indicates that there are potential environmental justice concern areas in and adjacent to the Eglin AFB reservation.

Noise Complaints

People and physical structures that are potentially susceptible to noise effects from the activities conducted on the test areas are in communities surrounding the Eglin AFB reservation. For several years, the majority of noise complaints due to military activities at Eglin AFB have come from the city of Niceville. Table 3-29 shows the total number of complaints per city in 2011 and the actual number of complainants, and Table 3-30 provides the types of noise complaints received during 2011 from activities performed on the Eglin Complex.

Table 3-29. 2011 Noise Complainant Data per City

City	Total Number of Complaints	Total Number of Complainants (according to phone number)
Choctaw Beach/Freeport Florida	9	3
Defuniak Springs, Florida	3	3
Destin, Florida	2	2
Evergreen, Alabama	1	1
Miramar Beach, Florida	2	1
Niceville, Florida	35	4
Santa Rosa Beach, Florida	2	2
Shalimar, Florida	1	1
Valparaiso, Florida	1	1

Source: Cole, 2012

Note: Noise complaint data listed are not attributed to any specific test area or activity unless confirmed by action officer.

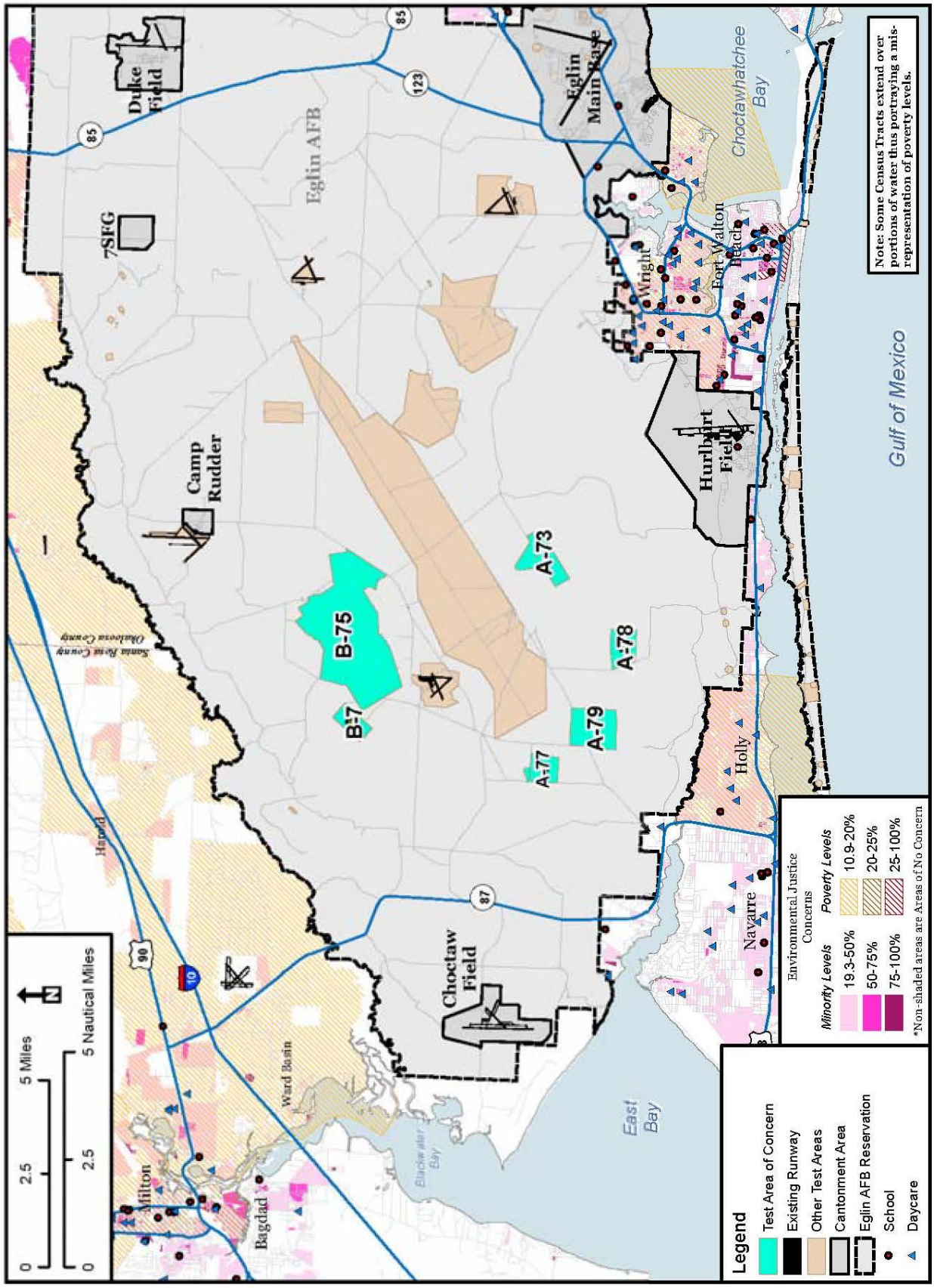

Figure 3-8. Environmental Justice Areas of Concern

Table 3-30. Eglin AFB 2011 Noise Complaint Data by City and Type of Complaint

Location	Complaint	Number of Complaints
Choctaw Beach/Freeport	Explosions causing house to shake/potential damage	7
Choctaw Beach/Freeport	Bomb noise/concerns	2
Defuniak Springs	Explosion causing house to shake/potential damage	2
Defuniak Springs	Low flying jet/noise	1
Destin	Explosions causing house to shake/potential damage	2
Evergreen	Bomb noise/concerns	1
Miramar Beach	Explosions causing house to shake/potential damage	2
Niceville	Explosions causing house to shake/potential damage	30
Niceville	Low flying jet/noise	5
Santa Rosa Beach	Explosions causing house to shake/potential damage	2
Shalimar	Explosions causing house to shake/potential damage	1
Valparaiso	Low flying jet/noise	1

Source: Cole, 2012
Note: Noise complaint data listed are not attributed to any specific test area or activity unless confirmed by action officer.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the current level of activity, the only anticipated consequence to residential areas is impacts from noise. Under the No Action Alternative, the noise levels exceed the 62 dB threshold for the annual L_{Cdn} that determines public annoyance. Public annoyance is often the most common impact associated with exposure to elevated noise levels. When subjected to day/night average sound levels of 62 dB, approximately 12 to 15 percent of persons so exposed will be "highly annoyed" by the noise. Given the current level of activity, the L_{Cdn} noise contours derived from munitions activities extend beyond the boundaries of the Eglin reservation and into residential areas within Santa Rosa County and Okaloosa County. Approximately 2,741 acres of land within Santa Rosa County and Okaloosa County are within the 62 dB under the No Action Alternative. The total number of persons that reside within the noise contours comprise approximately 2.4 percent of the total combined population of the two counties.

When using the combined Santa Rosa County and Okaloosa County ratios as the COC, these contours extend into areas with environmental justice concerns. Figure 3-9 shows the residences, schools, and daycares that exist within the noise contour lines exceeding the L_{Cdn} of 62 dB under the No Action Alternative. In general, land uses become incompatible in areas exposed to noise levels above this level. Table 3-31 indicates the total number of low income and minority persons within the noise contour lines exceeding the L_{Cdn} of 62 dB under the No Action Alternative.

Table 3-31. Minority and Low Income Persons within the Respective Noise Contours

Population	Number of Persons	Total Population Affected	Percent of Total Population Affected
Low Income	890	8,132	11.0%
Minority	2,145	8,132	26.4%
Persons under 18	1,949	8,132	24.0%

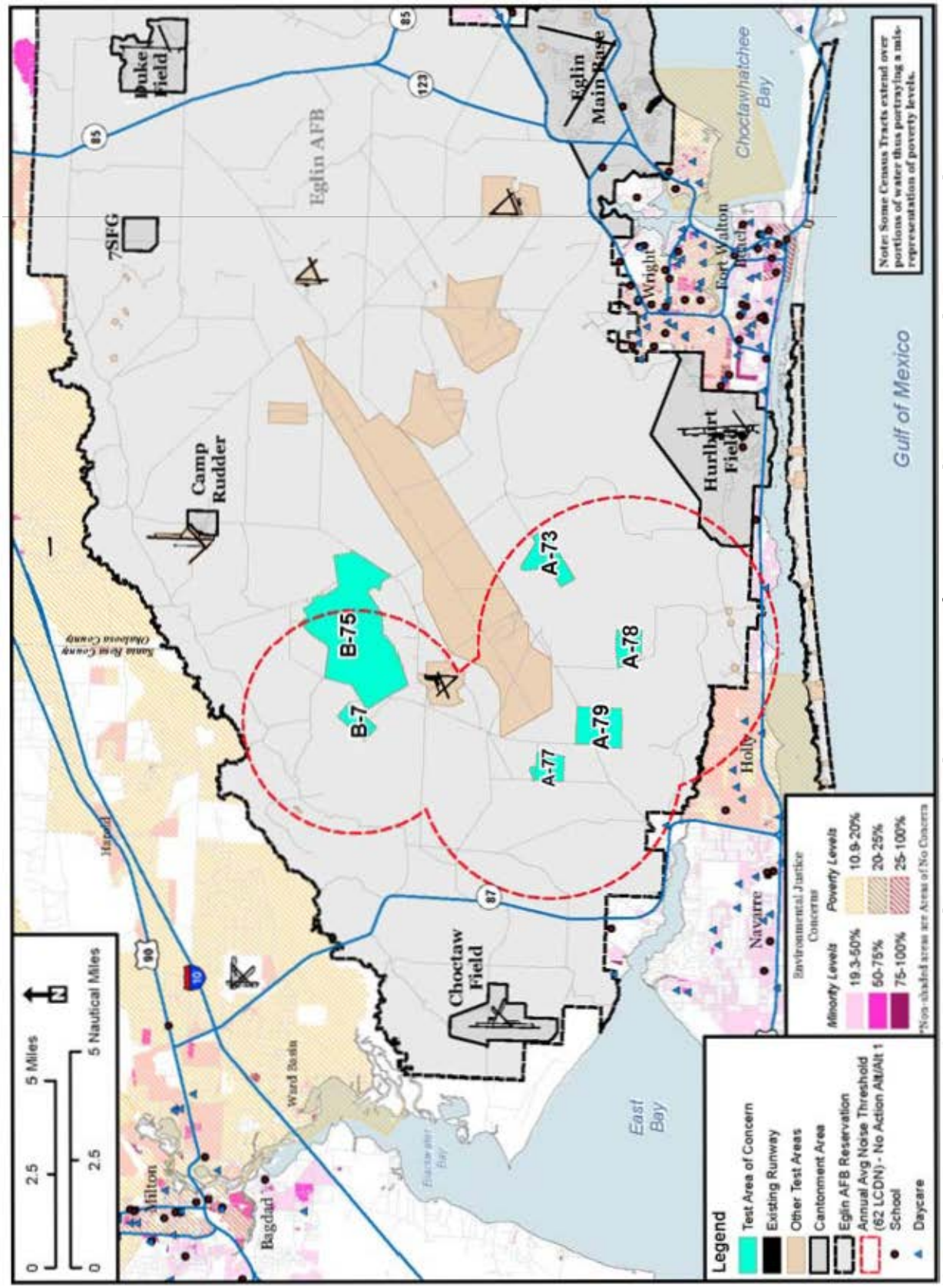

Figure 3-9. Noise Contours and Environmental Justice Areas of Concern Under No Action Alternative & Alternative 1

As described above, environmental justice impacts are determined by evaluating any disproportionate health impacts to minority or low-income communities. While the noise levels extend beyond the range into areas with the potential for environmental justice concerns, it must be noted that the noise levels exceed public annoyance levels but do not translate into direct adverse health impacts. In addition, detonating on days with high temperatures and low humidity would have the greatest potential for annoyance to nearby off-base receptors. These potential impacts may result in complaints from the local community. However, based on data from 2011 and described in Table 3-29, there were approximately 56 separate noise complaints reported in 2011. None of the 41 noise complaints reported that were confirmed by an action officer were associated with activities originating from TAs A-73, A-77, A-78, A-79, B-7, and B-75. In addition, the majority of complaints associated with activities at Eglin AFB from the past 10 years have originated from the city of Niceville, very few complaints have originated from Navarre, and none have been reported from Holly or Harold.

3.9.2.2 Alternative 1

Potential impacts to socioeconomic and environmental justice areas of concern would be similar to those described under the No Action Alternative. The additional testing and training performed at A-73 under this alternative would not be anticipated to create noise concerns that extend beyond base boundaries into residential areas during calm weather conditions. Detonating on days with high temperatures and low humidity would have the greatest potential for annoyance to nearby off-base receptors. To minimize the potential for noise propagation for detonations, activities should be performed only during favorable weather conditions.

3.9.2.3 Alternative 2

Under Alternative 2, a surge of activities at TAs A-73, A-77, A-78, A-79, B-7, and B-75 would increase the diameter of the noise contour representing the L_{Cdn} above 62 dB to cover approximately 9,260.2 acres of land (Figure 3-10) and affect approximately 5.4 percent of the total population of Santa Rosa County and Okaloosa County combined. As a result, compared with the No Action Alternative and Alternative 1, a larger impact area outside of the range would exist and a larger residential area representing environmental justice areas of concern would be exposed to noise levels above the annoyance threshold which is used to determine residential land use compatibility. In addition, the number of schools and daycares within the noise contours would increase (see Figure 3-10). Although a greater number of persons are affected under Alternative 2 including persons under 18 years of age, the number of low income and minority persons comprise a smaller percent of the affected population and therefore, comprise a smaller percent of the affected population under Alternative 2 (Table 3-32).

Table 3-32. Minority and Low Income Persons within the Respective Noise Contours under Alternative 2

	Number of Person	Total Population Affected	Percent of Total Population Affected
Low Income	1,944	17,866	10.9%
Minority	4,124	17,866	23.1%
Persons Under 18	4,300	17,866	24.1%

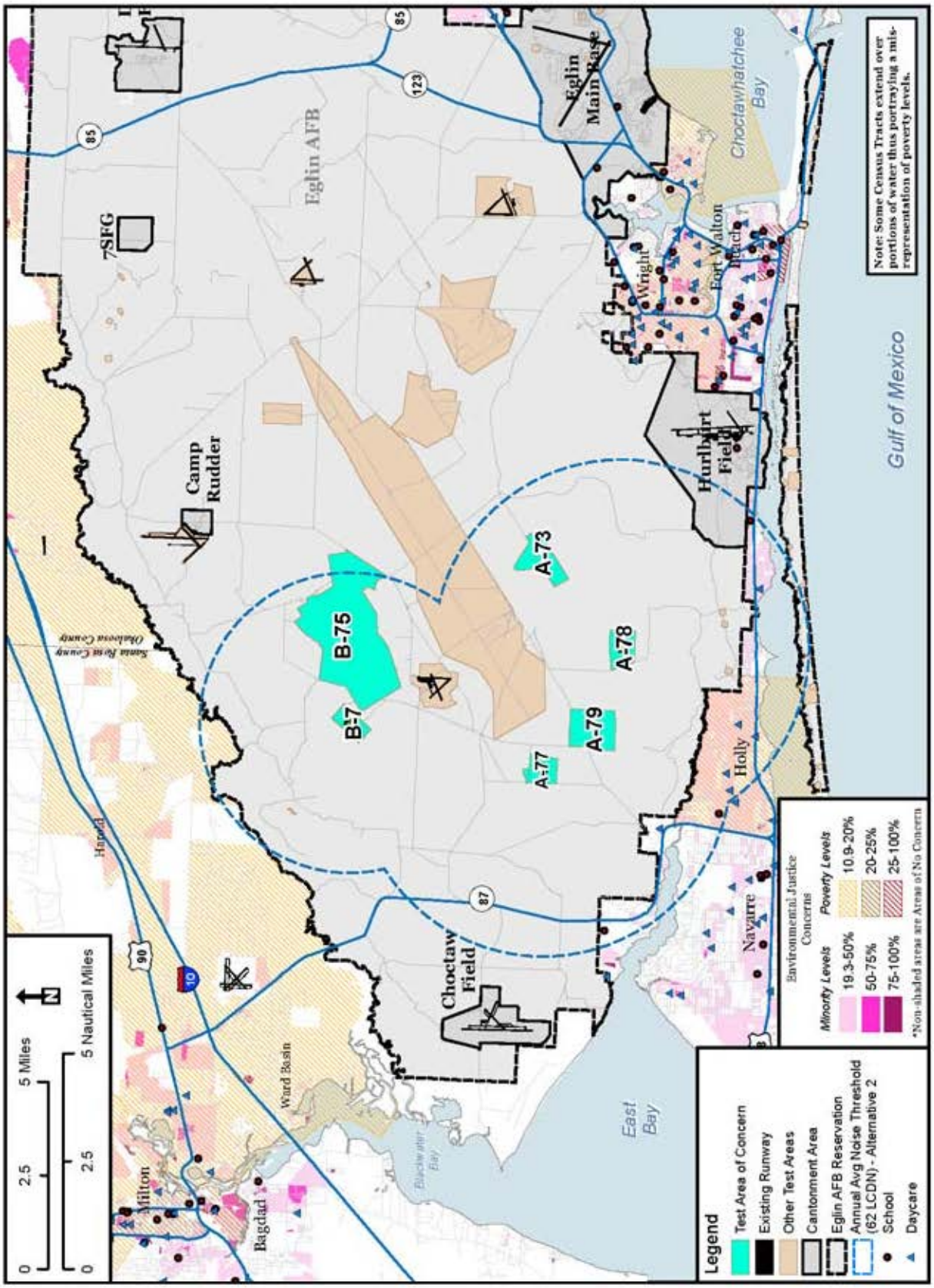

Figure 3-10. Noise Contours and Environmental Justice Areas of Concern under Alternative 2

As a result, more frequent complaints due to noise on the range may be made. To minimize noise propagation for detonations, activities should be performed only during favorable weather conditions.

3.10 LAND USE

Land use generally refers to human management and use of land. At TAs A-73, A-77, A-78, A-79, B-7, and B-75, the current land uses consist of only military testing and training. Nearby land use also includes recreational and natural resources management, which is discussed in detail in the *Integrated Natural Resources Management Plan (INRMP)* (U.S. Air Force, 2007b).

Eglin AFB has 465,693 acres of land range with 50 land test areas in Okaloosa, Santa Rosa, and Walton Counties, and a small section in Gulf County. Approximately 14,000 acres are improved, 46,000 acres are semi-improved, and 405,000 acres are unimproved. Eglin AFB manages the Joint Gulf Range Complex, a complex that has over 120,000 square miles of overland and overwater airspace. Management of adjacent land and water areas provide Eglin AFB a sea-to-land transition area necessary for modern weapons system research, development, testing, and evaluation. All branches of the armed services use Eglin AFB land and water ranges to train.

3.10.1 Affected Environment

Test Areas A-73, A-77, A-78, A-79, B-7, and B-75 are utilized for military testing and training activities and therefore, closed to the public. Recreational areas are only located within interstitial areas on Eglin AFB and not within the boundaries of the test areas. However, at times military-related activities can overlap with other land uses, including recreation. More detailed information on the types of military testing and training activities on subject test areas are provided in Chapter 2.

There are approximately 280,000 acres of land open for outdoor recreation (U.S. Air Force, 2011a). Public recreation on Eglin AFB is permitted during daylight hours only, with the exception of approved campsites after sunset. Outdoor activities include hunting, fishing, hiking, and camping. The total number of recreational permits sold for fishing, camping, and recreation use on Eglin AFB is shown in Table 3-33. Data on the frequency of use by authorized permit owners are not compiled and are therefore unavailable (Reece, 2011).

Table 3-33. Total Number of Recreational Permits Issued at Eglin AFB, FY 2011

Activity	Number of Permits
Hunting	5,362
Fishing	4,620
Camping	612
Special Activity/Forest Product	370
Recreation	5,968
Total	16,932

Source: Reece, 2011
AFB = Air Force Base; FY = fiscal year

Because TAs A-73, A-77, A-78, A-79, B-7, and B-75 are all located in areas of Eglin AFB that are closed to all forms of public access, recreational use by the public does not occur. All persons that engage in outdoor recreational activities are required to adhere to applicable Eglin AFB, federal, and state laws, rules, and regulations. The Eglin Outdoor Recreation Map is available to all permit owners from the Eglin Natural Resources Section (96 CEG/CEVSN) at Jackson Guard. This map displays the Eglin AFB range areas and their level of public access. The nearest area of public access to the subject test areas is the Roberts Pond Still Hunting Unit located approximately 0.25 mile east of TA A-73 and nearly 1 mile southeast of the small arms firing range in the southwest portion of TA A-73.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

The No Action Alternative is defined as authorizing the level of activity approved in the 2004 *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 PEA* (U.S. Air Force, 2004). In the 2005 BRAC, it was determined that the ETTC will accommodate the activities of the 7SFG(A). The test areas being addressed in this REA are land areas that have a specific land use designation crucial to the support of national security and the military mission of the DoD. The weapon systems testing and training activities performed at TAs A-73, A-77, A-78, A-79, B-7, and B-75 are critical to building, maintaining, and improving the defense readiness of the U.S. military forces. Therefore, no significant impacts are anticipated to land use under the No Action Alternative. There are, however, potential impacts to recreational resources under the No Action Alternative. During certain testing and training activities, the safety footprint might require that portions of recreational areas be temporary closed which could result in an impact to recreational users. However, any impacts to recreational users are anticipated to be minor and temporary since there are other areas on Eglin AFB available and closures only last for the duration of the activity. Temporary closures may become permanent if Eglin AFB elects to not clear an area after a mission. It may not be possible to clear the area depending on the type of contamination and/or budget restrictions; however, this is not common or considered likely. Therefore, no significant impacts are anticipated to land use and recreation resources under the No Action Alternative.

3.10.2.2 Alternative 1

Under Alternative 1, the level of activity would increase with the addition of future foreseeable activities, as outlined in Section 2.2.2. The land use designation would remain as a test area for the primary purpose of supporting weapons system and training activities; therefore no impacts are anticipated to land use under Alternative 1. Similar to the No Action Alternative, there would be a chance that mission safety profiles associated with certain testing and training activities would overlap recreational areas and therefore would require closures to sections of the interstitial areas that are open for recreational purposes. However, closures to these areas would only last for the duration of the activity and therefore are anticipated to be minor and temporary and are not anticipated to result in a significant impact to land use or recreation resources.

3.10.2.3 Alternative 2

Under Alternative 2, the same level of activity would occur as in Alternative 1, but with the additional capability of a surge in the testing/training mission. The impacts to land use and recreational areas would be the same as those described under Alternative 1. There would be no changes to land use designation, therefore no impacts to land use are anticipated. This may result in an increase in the potential for closures to certain recreational areas in order to support mission activities performed at TAs A-73, A-77, A-78, A-79, B-7 and B-75. However, impacts to recreational resources are anticipated to be minor and temporary since other areas would be available to recreational users and closures would only last for the duration of the activity. Therefore, no significant impacts are anticipated to recreational resources.

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4. CUMULATIVE IMPACTS

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

The CEQ regulations for accomplishing NEPA (42 U.S.C. Sections 4321-4370d) define *cumulative impacts* as the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7)." Chapter 3 considered the environmental impact of the proposed action and alternatives. The cumulative environmental impact of the proposed testing and training activities when added to other reasonably foreseeable future actions is considered in this section. Since the proposed action occurs primarily on Eglin AFB, other reasonably foreseeable projects and missions on Eglin AFB, particularly those that focus on the affected training areas, are the focus of this analysis.

4.1.1 Past and Present Actions

Test and training activities have historically occurred on an ongoing basis throughout Eglin AFB, including the affected test areas. Ground movement, air-to-ground and ground-to-ground ordnance use, and other activities involving detonations have occurred regularly, although the tempo and specific types of activities has changed according to prevailing requirements. The Air Force has not identified other specific past or present actions that are relevant to the current proposed action. Potential future actions that could impact existing resources are described in the following section. BRAC actions are included in the description of future activities, although some components of the action are presently underway.

4.1.2 Reasonably Foreseeable Future Actions in the Vicinity of the Proposed Action

2005 BRAC Decisions and Related Actions

BRAC recommendations affecting Eglin AFB were provided in September 2005. As a result of BRAC decisions, two military organizations are being realigned to Eglin AFB. The 7SFG(A) has relocated to Eglin AFB from Fort Bragg, North Carolina. In addition, the Joint Strike Fighter (JSF) Initial Joint Training Site (IJTS) is being realigned to Eglin AFB from various installations, including Luke AFB, Marine Corps Air Station Miramar, Naval Air Station Oceana, Sheppard AFB, and Defense Threat Reduction Agency National Command Region Conventional Armament Research. Realignment of the two organizations is currently in progress.

The 7SFG(A)'s principal mission includes planning and executing unconventional warfare, combating terrorism operations, direct action, special reconnaissance, and foreign internal defense in support of the Global War on Terrorism. Realignment to Eglin AFB provides joint training synergy with AFSOC and places 7SFG(A) on training lands that match their wartime area of responsibility. Establishing the JSF IJTS at Eglin AFB consolidates the initial instruction of entry level pilots and maintenance technicians for the U.S. Air Force, Navy, and Marine Corps. The purpose of the JSF IJTS is to train personnel on safely operating and maintaining the

new JSF (F-35) aircraft. A Supplemental EIS is currently under way to analyze options for new runways or reconfiguring existing Eglin AFB runways to accommodate additional aircraft.

The BRAC actions result in new missions at Eglin AFB and an increase in Eglin AFB's personnel and military activities. The 7SFG(A) has constructed a cantonment area for billeting and operations. A Special Operations Forces Compound includes facilities for three Special Forces Battalions, a Motorized Special Forces Battalion, a Group Support Battalion, and the Group Headquarters. The 7SFG(A) utilizes unmanned aerial vehicles and wheeled, but not tracked (e.g., tank), vehicles for training exercises. The 7SFG(A) utilizes various fixed-wing and rotary-wing aircraft from the Army and Air Force to conduct air operations. The 7SFG(A) training component involves three areas: (1) firing ranges, (2) aircraft operations, and (3) water operations and ground maneuvers.

Establishing the JSF IJTS requires construction of a cantonment area to accommodate JSF personnel. JSF training includes initial training, transition/conversion training, refresher/re-qualification training, and instructor training. A total of 59 F-35 aircraft will be introduced to Eglin AFB over a period of years. The actual scope of flight operations is not precisely known and will likely change over time with implementation of adaptive management. However, a reasonable scenario is about 279,500 total aircraft operations (F-35 and all other aircraft) annually. Training elements include flying operations (takeoffs, landings, closed patterns) and ordnance use (bombs, 25 mm munitions, flares).

The BRAC Final EIS (U.S. Air Force, 2008) provides a list of actions planned to occur at Eglin AFB that, while affected by BRAC implementation, would occur independently whether BRAC decisions were implemented or not. The subset of these actions considered potentially applicable to the A&GG EA include the following.

33d Fighter Wing (33 FW) Drawdown. The 33 FW drawdown resulted in loss of 1,638 personnel and some F-15 aircraft. This is estimated to reduce the annual number of sorties in 2016 by about 10,000, which represents about 70 percent of the current annual sorties at Eglin AFB.

C-130 Drawdown. This drawdown involves the loss of C-130 aircraft belonging to the Air Force Reserve's 919 SOW located at Duke Field. These aircraft would leave the Air Force inventory beyond the year 2013. The 919 SOW provides aerial refueling of helicopters and supports troop infiltrations in support of AFSOC. Approximately 1,400 associated personnel would move to Hurlburt Field.

Air Force Special Operations Command Assets Beddown – Cannon AFB New Mexico. This action will involve the movement of 108 AFSOC aircraft to Cannon AFB, along with approximately 1,000 associated personnel.

Addition of Personnel and Multiple Construction Activities. Numerous personnel additions and construction of various structures are planned at Eglin AFB. These actions could indirectly affect resources through increased human presence and noise. The actions include relocation of Florida Army National Guard, U.S. Army Corps of Engineers, and Air Force Cost Analysis Agency personnel, as well as 24 military construction projects at Eglin AFB and Duke Field.

Alabama Army National Guard implementation of a portion of their Master Plan at Cobb Training Site on Eglin AFB. The ALARNG has proposed to implement improvements described in the ALARNG Master Plan for Cobb Training Site including development of a Military Ground Training Area (12,000 acres for maneuver and training on TA B-75 or B-5), a small arms range complex (over 170,000 blanks and 500 blast simulator canisters annually), and cantonment area (300 acres). An EA associated with this action identified the following potential issues: new safety footprints in areas currently open to the public; increased noise levels; 126 acres of RCW foraging habitat and 1 RCW cavity tree impacted by construction; and periodic Highway 87 closure.

Small Arms/Large Caliber Testing and Training. Approximately 5,500 explosive events would continue to occur in training areas located near or co-located with the proposed 7SFG(A) training ranges as part of explosives testing and explosives ordnance disposal activities.

New Live Fire Ranges. As identified in the Eglin AFB *Estuarine and Riverine Areas Programmatic Environmental Assessment (PEA)*, two new live fire ranges may be developed in the future. Munitions use in these areas as well as throughout the riverine-estuarine areas of Eglin AFB include an increase of about 33,000 rounds of 5.56-mm to 0.50-caliber munitions and 4,000 rounds of 5.56- to 40-mm practice rounds. These increases also represent a 100 percent increase in the amount of munitions used for these activities under the baseline.

Air Delivered Weapons. With the realignment of AFSOC to Cannon AFB, it is anticipated that there will also be a decrease in the amount of air-delivered munitions utilized during AFSOC training activities. Reductions in munitions use resulting from disestablishment of the old 33 FW will continue to be minimal as the 33 FW was an air-to-air mission, which did not typically use air-to-ground ranges. Currently, the JSF IJTS has been stood up as the new 33 FW, and their use of air-to-ground weapons is expected to increase over the coming years.

4.1.3 Reasonably Foreseeable Future Actions

Chemical Materials

Most chemical material emissions on Eglin Reservation are related to munitions testing and training operations. As ground operations and air-to-ground training increase, particularly with surge capabilities, increased munitions use would result in additional metals and other substances deposited onto the Eglin reservation. The potential cumulative impacts of all past, present, and future ordnance emissions and by-products, in combination with air-to-ground training activities, is difficult to assess. Clean-up of ordnance from ranges is not always thorough or even feasible. Constituents from ordnance may migrate to soils, surface water, and groundwater. The soil concentrations of various metals on TA B-75, a heavily used range, were found to be below Eglin AFB background levels and substantially below USEPA RBCs (Section 3.2.2). In addition, projected copper and lead concentrations based on surge capacity are not expected to reach levels of significance. Conversely, modeling described in the 2004 *Air-to-Ground Gunnery PEA* (U.S. Air Force, 2004) suggests that background and ecological soil screening levels could be exceeded for some ordnance constituents. To prevent adverse cumulative impacts from HM on test areas, monitoring of soil and groundwater is recommended, along with implementation of the BMPs and munitions residue range sustainability practices outlined in U.S. Air Force (2004).

Implementation of the proposed action in conjunction with other projects already occurring and expected to in near future would not lead to significant impacts. Additive impacts that would overlap with the implementation of other actions, such as the BRAC realignment, may cause additional increase in the use/storage of HM and generation of debris or HW from construction projects and training. No significant impact would be expected from the combination of activities and any impacts would be mitigated by using the present Eglin AFB HM and HW management procedures and policies.

Soils and Water Resources

In addition to chemical deposition from ordnance expenditures, soil and water resources may be impacted from erosion caused by troop and vehicle use. Erosion can reduce the terrestrial habitat value of affected areas and adversely alter water quality, habitats, and the hydrologic form and function of waterways and wetlands. The tempo of ground-based and air-to-ground activities that may initiate or accelerate erosion could increase substantially in the future. Management practices, such as those described in Chapter 5, will continue to be required for future ground-disturbing activities. Implementation of these management actions is expected to prevent erosion impacts from reaching significant levels.

Biological Resources

Future construction projects will convert some natural habitats to buildings, parking lots, roads, landscaped areas, and firing ranges, while increased use of the range for ground training operations may limit access for natural resource management including prescribed fire, forest restoration activities, and endangered species monitoring. These activities may also increase fragmentation of the landscape. Increased human presence and noise may harass certain species, such as the RCW, leading to issues with nesting and foraging.

Increased ordnance use and ground activity will increase the potential for direct physical impacts, noise effects, and habitat alteration. It is assumed that the probability of physically striking a wildlife species would increase proportionally to the level of cumulative activity. However, impacts would not be significant. Ordnance is typically directed at targets which have less associated wildlife. Foot and vehicle movement generally occurs on established roads, where wildlife would be more readily seen and avoided. Interstitial movements are relatively infrequent and nonintrusive, though the frequency is increasing. Continued review and coordination of activities with Eglin Natural Resources Section will be required to identify unacceptable levels of impact and required management actions.

Noise associated with detonations and general human presence/activity would increase from activities such as construction and 7SFG(A) operations. Wildlife species, including sensitive species, would respond in a variety of ways including startle response, flushing, avoidance, and biochemical (stress hormone) reactions. While impacts to individuals or groups are expected, population-level effects would probably not be detected. For example, RCWs have continued to nest in proximity to test areas, and the overall population is increasing. However, continued population monitoring of sensitive species will be required in order to detect significant impacts. It is anticipated that management of sensitive species will benefit most other species as well. Continued review and coordination of mission activities with Eglin Natural Resources Section will be required.

The primary issue related to habitat alteration is wildfire potential. Wildfires typically are associated with ordnance and pyrotechnics use. Increased activity could result in more wildfires on the test areas, and some percentage of these fires may cross the test area boundaries into interstitial areas. This could result in destruction of sensitive habitats such as special natural areas and significant botanical sites. Of particular concern is damage or destruction of RCW cavity trees, foraging areas, and direct impacts to individual birds. There is potential for significant cumulative impacts due to wildfires, particularly given recent restrictions on firefighting activities in some areas. Adherence to fire policies and continued proponent coordination with Eglin Natural Resources Section will be required to mitigate impacts.

Cultural Resources

Damage to the nature, integrity, and spatial context of cultural resources can have a cumulative impact if the initial act is compounded by other similar losses or impacts. The alteration or demolition of historic structures and likewise the disturbance or removal of archaeological artifacts may incrementally impact the cultural and historic setting of Eglin AFB.

The implementation of the Proposed Action and alternatives has the potential to cumulatively impact cultural resources. While the likelihood of direct impacts to cultural resources are remote, the proposed increase in munitions usage, although occurring in areas already utilized for these activities, increases the likelihood of direct, indirect, and cumulative impacts to cultural resources on the ranges or (in the case of munitions accidently traveling off-range) off the range as well. In addition, the increased operational tempo of these activities has the potential to lead to reduced access to these ranges and may affect site monitoring activities performed by 96 CEG/CEVSH. Increased coordination between 96 CEG/CEVSH and Range personnel, as well as any measures to allow access for monitoring activities to continue on a regular basis, would reduce the potential for cumulative impacts to archaeological resources.

Air Quality

Air quality could be temporarily impacted by construction activities, flight operations, munitions expenditures, and military and personal vehicle usage. Applicable emissions include both mission and non-mission activities. Based on previous analysis of numerous proposed actions, cumulative impacts to air quality from all current and reasonably foreseeable actions on Eglin AFB would be insignificant.

Noise

This subsection considers noise impacts to humans; wildlife impacts are addressed in the Biological Resources subsection above. Noise impacts may be cumulative in the sense that the average ambient noise of an area could increase from several independent actions, or the increased number of noise events of a particular kind (e.g., an explosion) from unrelated actions may result in an increased sensitivity of human receptors and therefore an increase in the number of complaints. Actions described in this EA would produce noise that is similar to ongoing activities at Eglin AFB. Future activities would also be similar in nature, although complaints associated with F-35 aircraft may or may not increase over the level due to aircraft currently at Eglin AFB. Ordnance use may produce noise levels off the Eglin AFB boundary that are associated with annoyance, although levels causing physiological damage are not exceeded.

Activities that produce annoyance to some number of individuals will continue and likely increase, but significant cumulative impacts have not been identified.

Safety and Restricted Access

There would be no cumulative safety impacts to the general public from current and future activities on Eglin AFB because civilian presence is prohibited in unacceptable areas. Military personnel potentially would be exposed to increased levels of munitions use and UXO. However, consultation and coordination with 96 CES/CED would mitigate potential adverse UXO impacts. The current safety policies and procedures are expected to ensure personnel safety.

Recreational hunting has been restricted to some degree by relocation of 7SFG(A), and general increased test and training activity will likely result in more frequent temporary closure of recreational areas. Given the amount of acreage available on Eglin AFB for recreation, along with continued advanced notification of closures for recreational access planning purposes, restricted access is not considered a significant cumulative impact.

Socioeconomics and Environmental Justice

Construction, facility improvements and infrastructure upgrades associated with past, present, and foreseeable actions would provide additional beneficial impacts to the local economy from the use of local labor and supplies. Although individual projects may be temporary, over time these activities may provide sustainable employment and earnings and result in beneficial cumulative impacts. BRAC implementation is expected to have a long-term beneficial economic impact. Drawdowns could have a negative impact, but overall net effects of Eglin AFB realignment would be positive.

Noise levels associated with annoyance extend off the Eglin AFB boundary into areas with environmental justice concerns. However, as discussed previously, significant cumulative noise impacts have not been identified.

Land Use

Other than the increased restrictions (permanent and temporary) on recreational activities described under Restricted Access, changes to land use on the Eglin reservation are not anticipated due to current or future activities.

5. PLANS, PERMITS, AND MANAGEMENT ACTIONS

5.1 REGULATIONS, PLANS, AND PERMITS

For a detailed list and brief description of all relevant laws, regulations, and policies see Appendix A, *Relevant Laws, Regulations, and Policies.*

- CZMA Consistency Determination (Appendix F)
- NHPA Section 106 Consultation (Appendix G)
- ESA Section 7 formal consultation (Appendix H)
- EAFBI 13-212, Range Planning and Operations (U.S. Air Force, 2010a)
- EO 11988, Floodplain Management (1977, 42 Federal Register 26951)

5.2 MANAGEMENT ACTIONS

The REA was prepared with the expectation that the following management actions will be implemented for all activities on the test areas. Management actions are provided for each resource area, where applicable. Action proponents are responsible for ensuring these actions are adhered to.

Chemical Materials

The transport, storage, use, and disposal of HM and HW associated with activities within test areas should be coordinated with Eglin AFB's 96th Civil Engineer Group/Environmental Compliance Branch, Pollution Prevention Section.

HW must be disposed of according to regulations and AAC Plan 32-5, *Hazardous Waste Management Plan*.

In compliance with AFI 13-212, munitions debris must be recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste.

Any dudded munitions or UXO must be flagged and removed according to standard procedures.

Soils and Water Resources

In compliance with AFI 13-212, munitions debris must be recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste.

BMPs would reduce and avoid potential soil, groundwater and surface water impacts on TAs A-73, A-77, A-78, A-79, B-7, and B-75, resulting from deposition of munitions residues and erosion. Although munitions may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA risk-based thresholds. Munitions expenditures, particularly air-to-surface bomb delivery training, air-to-surface gunnery operations, and surface-to-surface small arms training would contribute to increased soil erosion. The severity of these

potential impacts could be diminished by implementing management requirements identified in the *Test Area B-75 Final Range Environmental Assessment (REA)* (U.S. Air Force, 2010b) and those discussed below.

The most pertinent BMP actions, which would decrease impacts to soil quality and erosion, migration into groundwater and transport to surface waters are summarized as follows:

- Maintain a minimum 100-foot vegetated buffer between surface waters and bare soil testing areas.
- Do not establish any new cleared target areas within 200 feet of any natural water body.
- Adhere to *Eglin's Wildfire Specific Action Guide Restrictions* for pyrotechnics use.
- Detonations of explosives should not occur within 200 feet of water bodies.
- Immediately remove any ordnance that lands in streams bank areas and interior objectives, in accordance with Air Force regulations.
- Conduct target and ordnance debris removal and disposal of solid debris from blanks, chaff, smokes, and flares, in accordance with Air Force regulations.
- Employ bullet containment (for example, the bullet trap on A-73), lead projectiles management, and lead reclamation to reduce lead concentrations.
- Vehicles should remain on roads or established tracks and corridors.
- Conduct groundwater quality sampling as necessary near any open detonation pit.
- Minimize target vehicle placement on sloped areas, and restrict track vehicles operation in areas with a slope greater than 5 percent to help reduce erosion.
- Establish low-growing grassland communities on severely disturbed areas susceptible to erosion, reduce the frequency of vegetation management practices, and incorporate erosion control practices as needed on adjacent areas.
- Design concave slope segments on newly constructed targets and establish and/or maintain vegetative buffers on existing target sites.
- Relocate targets to areas on the test area less prone to erosion impacts and surface water contamination.
- Reduce slope gradients and avoid existing or potential unstable slopes.
- No digging or other ground disturbing activities to take place without prior authorization.
- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Locate and design missions to avoid existing or potential unstable slopes, and to avoid reducing vegetative cover.
- Revegetate unstable slopes when feasible; maintain grassland buffers around target sites.
- Wood ash may also be utilized to raise soil pH.

Biological Resources

Noise

Firing activities should occur at regular intervals, when possible. Haphazardly timed and variable noise creates higher levels of disturbance to wildlife.

Wildfire Prevention

The largest potential agent for habitat alteration on and around the test areas is wildfire. The following measures would minimize the potential for wildfires:

- Follow Eglin's *Wildfire Specific Action Guide Restrictions* for pyrotechnics use by class day; specifically, do not conduct hot missions under class D or E levels as determined by the Wildland Fire Management Program at Jackson Guard.
- Through Jackson Guard, have sufficient resources (i.e., fire management personnel and equipment) available to respond to fire emergencies.
- Maintain graded road grid around gunship ranges to facilitate suppression in the event of a wildfire ignition.
- Use Eglin AFB's burn prioritization model to increase the prioritization of prescribed fire at the test areas, so that an approximately two-year burn interval is maintained around all these ranges to reduce hazardous fuel accumulations.
- Per the Eglin Wildfire Specific Action Guide, establish post-mission fire watch of 20 to 30 minutes to search for smoke/fire from mission activities, unless otherwise directed by Jackson Guard.
- Immediately notify Eglin Fire Department Dispatch of any wildfire started as a result of gunnery missions.

Red-cockaded Woodpecker

Wildfire impact to cavity trees is the biggest threat to RCW recovery on Eglin AFB. In addition to the wildfire measures listed above, implementation by the Eglin Natural Resources Section of the following would minimize RCW cavity tree mortality:

- Prep RCW cavity trees before prescribed burns.
- When monitoring RCW cavity trees adjacent to these ranges, record cause of mortality.
- Replace any cavity tree damaged by fire to the point that it is unsuitable for nesting or roosting with an artificial cavity within 72 hours of the damage according to the *Eglin Air Force Base (AFB) Integrated Natural Resources Management Plan (INRMP) Biological Opinion (BO)* from the USFWS. This will be accomplished by one or a combination of (1) retaining a contractor to install the artificial inserts, (2) partnering with the Gulf Coast Plain Ecosystem Partnership to install the artificial inserts, and (3) training Eglin Natural Resources Section personnel to install the artificial inserts.

Adherence to U.S. Army Guidelines (U.S. Army, 2007) would minimize potential noise and disturbance to RCWs from ground movement activities. An important component is the recognition of a 200-foot buffer zone around individual RCW cavity trees where certain activities are restricted. The USFWS has agreed with the U.S. Army that transient foot traffic within 200 feet of cavity trees would have no effect on RCWs, nor would transient vehicle traffic that stayed on existing roads. Transient activities are defined as those that involve maneuver-type training, have low-intensity human activity, and a short-term (less than two-hour) human presence. Activities that are not allowed within the 200-foot buffer zone include bivouacking and establishing command posts and excavating/digging.

Active and inactive RCW trees are marked with one band of white paint. The proponent may be required to mark 200-foot buffer zones around active RCW cavity trees potentially impacted by ground movements. Additionally, military activities that are within or near stands of mature long-leaf pine and scheduled during RCW nesting season (late April–July) should be coordinated with the Natural Resources Section. Monitoring of RCWs should also continue. A complete list of allowed and unallowed activities is provided in Table 5-1.

Additional RCW management requirements are as follows:

- Use of targets should be shifted to internally established targets that are away from active RCW cavity trees.
- Helicopter landing zones used for recurring activities must not be located within 500 feet of active RCW trees.
- Cutting of RCW cavity trees (marked with one band of white paint) is prohibited.
- Cutting of any long leaf pine trees are prohibited without prior authorization.

Flatwoods Salamander Habitat

- No off-road vehicle traffic, digging, or vegetation cutting is allowed with a 1,500 foot buffer of confirmed or potential flatwoods salamander habitat.
- Vehicles must remain on existing roads when moving through or near the 1,500 foot buffer.
- Do not release toxic aerosols within 1,500 feet of salamander ponds.
- South of the East Bay River, limit large troop movements (greater than 10 troops) to established roads.
- For training that will occur repeatedly in areas with flatwoods salamander habitat, field maps must include these locations so troops can appropriately apply the above requirements.

Eastern Indigo Snake

- If an eastern indigo snake is sighted, stop activities until the snake is out of harm's way.
- Notify Eglin Natural Resources Section of the sighting.

Table 5-1. Training Activities within RCW Buffer Zones

Maneuver and Bivouac	Allowed
Hasty defense, light infantry, hands and tool digging only, no deeper than 2 feet, two hours maximum	Yes
Hasty defense, mechanized infantry/armor	No
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	Yes
Armored vehicle transit through the cluster	Yes
Cutting natural camouflage; hardwood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than two hours	Yes
Weapons firing	Allowed
7.62 mm and below blank firing	Yes
.50-caliber blank firing	Yes
Artillery firing point/position	No
MLRS firing position	No
All others	No
Noise	Allowed
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman type devices	Yes
Pyrotechnics/smoke	Allowed
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil and/or graphite flakes	Yes
Smoke grenades	Yes
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
HC smoke of any type	No
Digging	Allowed
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

CS = 2-chlorobenzalmalononitrile; CS/CSS = Combat Support/Combat Service Support; HC = hexachloroethane; MLRS = multiple launch rocket system; mm = millimeter; RCW = red-cockaded woodpecker

Gopher Tortoise

- If a gopher tortoise is sighted, stop activities until the tortoise is out of harm's way.
- Notify Eglin Natural Resources Section of the sighting.
- Do not drive over, step in, fill, or in any way cause a tortoise burrow to collapse.
- Avoid gopher tortoise burrows by at least 25 feet.

- Prior to any land clearing, coordinate with Eglin Natural Resources Section regarding required gopher tortoise surveys.

Florida Black Bear

- Take care to avoid hitting bears along roads.
- Allow bears to move out of harm's way before resuming activities.
- Notify Eglin Natural Resources Section if a live bear or road mortality is sighted.
- Properly dispose of waste to avoid attracting bears.
- Use bear-proof trash receptacles.
- Keep all food in air-tight containers.

Gopher Frog

- No off-road vehicle traffic, digging, vegetation cutting, or pyrotechnics/munitions use is allowed within 100 feet of breeding ponds.

Florida Bog Frog

- No off-road vehicle traffic, digging, vegetation, or pyrotechnics/munitions use is allowed within 100 feet of bog frog streams.
- Remain in established roads when crossing bog frog streams.

Burrowing Owl

- For missions involving off-road vehicle use or other ground-disturbing activities near burrowing owl burrows, contact Eglin Natural Resources Section as it may be necessary to install markers near the burrows for avoidance.
- Stay at least 25 feet away from marked and unmarked burrows.

Cultural Resources

Sites on A-79 and B-75 considered eligible and potentially eligible for the National Register must be protected until further testing is conducted. Protection includes avoidance by fencing, marking, or other means. Consultation with 96 CEG/CEVSH is required to determine locations that need to be avoided and protected.

Metts Cemetery, located outside of the boundaries of TA B-75, must be avoided if ground-disturbing activities are planned.

For all of the test areas, location-specific cultural resource information is sensitive and being continuously updated; consultation with 96 CEG/CEVSH is required to obtain the latest information for any ground-disturbing activities that might impact these areas.

Consultation with 96 CEG/CEVSH is required for any actions that could damage Cold War-era structures on B-75.

In the event that unknown cultural resources are discovered during a mission activity, all activity in the immediate vicinity must cease until the Base Historic Preservation Officer and 96 CEG/CEVSH have been notified and a determination of significance has been rendered.

- Leave any archaeological artifacts discovered in place and immediately report the location to the 96 CEG/CEVSH. If archaeological materials are discovered during construction or demolition activities, all actions in the immediate vicinity must cease and efforts taken to protect the find from further impact. Contact 96 CEG/CESVH immediately if a discovery occurs.
- Coordinate with the 96 CEG/CEVSH prior to any ground-disturbing activities beyond that already approved mission activities.
- Vehicle movements should be restricted near water bodies, on steep slopes, in areas where the soil is exceptionally soft or devoid of vegetation, and in areas where artifacts are located on the surface of the ground.
- The 96 CEG/CEVSH will be notified as early as possible in the planning process if modifications or demolitions to standing structures are to occur.

Noise

- Coordinate with the Eglin Safety Office to avoid conducting activities in weather conditions that may lead to hazardous noise impacts.

Safety and Restricted Access

- Implement safety profiles for land-based training where live ordnance is used.
- Implement personnel exclusion zones and appropriate safety buffers on live-fire ranges.
- Consultation and coordination with 96 CES/CED is required to protect personnel from UXO.

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APPENDIX A

RELEVANT LAWS, REGULATIONS, AND POLICIES

RELEVANT LAWS, REGULATIONS, AND POLICIES

The Range Environmental Assessment was prepared with consideration and compliance of relevant environmental laws, regulations, and policies; including federal and state laws and regulations, Department of Defense (DoD) directives, and AFIs. A brief description of specific laws and regulations that legally define issues of compliance associated with the mission activities of this document are outlined below.

General

42 United States Code (USC) 4321 et seq.; 1969; National Environmental Policy Act of 1969 (NEPA); Requires that federal agencies (1) consider the consequences of an action on the environment before taking the action and (2) involve the public in the decision making process for major federal actions that significantly affect the quality of the human environment.

Executive Order 12372; 14-Jul-82; Intergovernmental Review of Federal Programs; Directs federal agencies to inform states of plans and actions, use state processes to obtain state views, accommodate state and local concerns, encourage state plans, and coordinate states' views.

Executive Order 12856; 3-Aug-93; Right-to-Know Laws and Pollution Prevention Requirements; Directs all federal agencies to incorporate pollution planning into their operations and to comply with Toxics Release Inventory requirements, emergency planning requirements, and release notifications requirements of Emergency Planning and Community Right-to-Know Act (EPCRA).

Executive Order 12898; 11-Feb-94; Environmental Justice; Directs federal agencies to identify disproportionately high and adverse human health or environmental impacts resulting from programs, activities or policies on minority populations.

Air Force Instruction 13-212; 16-Nov-07 (incorporating change 10-Jul-08; certified current 6-Jan-10); Range Planning and Operations; Establishes procedures for planning, construction, design, operation, and maintenance of weapons ranges as well as defines weapons safety footprints, buffer zones, and safest procedures for ordnance and aircraft malfunction.

Eglin Air Force Base Instruction 13-212; 20-Dec-10; Range Planning and Operations; Implements Air Force Policy Directive (AFPD) 13-2, *Air Traffic, Airfield, Airspace, and Range Management* and sets forth policies regarding the Eglin Test and Training Complex activities of all personnel (all Active Duty, Civilians, Guard, Reserves, Contractors, etc) executing official business on the range and meets the requirements identified in AFI 13-212, *Range Planning and Operations.*

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention.

Air Force Instruction 90-803; 24-Mar-10; Environmental, Safety, and Occupational Health Compliance Assessment and Management; Implements AFPD 90-8 by providing guidance for establishing an assessment process designed to ensure compliance with Federal, State, and local environmental laws, Occupational Safety and Health Administration regulations, as well as DoD, and Air Force policies and instructions.

32 Code of Federal Regulations (CFR) 989; 1-Jul-01; Environmental Impact Analysis Process; This regulation provides a framework for how the Air Force is to comply with NEPA and the Council on Environmental Quality regulations.

Air Force Instruction 32-7062; 1-Oct-97 (certified current 13-Nov-09); Air Force Comprehensive Planning; Implements AFPD 32-70 by establishing Air Force Comprehensive Planning Program for development of Air Force Installations, ensuring that natural, cultural, environmental, and social science factors are considered in planning and decision making.

Physical Resources

Air Quality

42 USC 7401 et seq.; 40 CFR Parts 50 & 51; Clean Air Act (CAA), National Ambient Air Quality Standards (CAA, NAAQS); Emission sources must comply with air quality standards and regulations established by federal, state, and local regulatory agencies.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements CAA.

Air Force Instruction 32-7040; 27-Aug-07; Air Quality Compliance; This AFI sets forth actions for bases to implement to achieve and maintain compliance with applicable standards for air quality compliance, and responsibilities for who is to implement them. Includes requirements for NEPA and RCRA as well as CAA.

Florida Statutes (F.S.) Chapter 403, Part I; Florida Air and Water Pollution Control Act; Regulates air pollution within the state.

Florida Administrative Code (FAC) Chapters 62-204; Florida State Implementation Plan, with Ambient Air Quality Standards and Prevention of Significant Deterioration (PSD) Program; Establishes state air quality standards and requirements for maintaining compliance with NAAQS.

FAC Chapters 62-213; Operation Permits for Major Sources of Air Pollution; Adopted PSD permit program, designed to control the impact of economic growth on areas that are already in attainment.

Air Space Use

49 USC 106 & Subtitle VII; 1997; Federal Aviation Act of 1958; Created the Federal Aviation Administration and establishes administrator with responsibility of ensuring aircraft safety and efficient utilization of the National Airspace System.

14 CFR Part 71; 1997; Federal Aviation Regulation (FAR); Defines federal air routes, controlled airspace, and flight locations for reporting position.

14 CFR Part 73; 1997; Special Federal Aviation Regulation No. 53; Defines and prescribes requirements for special use airspace.

14 CFR Part 91; 1997; FAR; Governs the operation of aircraft within the United States (U.S.), including the waters within 3 nautical miles of the U.S. Coast. In addition, certain rules apply to persons operating in airspace between 3 and 12 nautical miles from the U.S. Coast.

Land Resources

16 USC 670a to 670o; 1997; Sikes Act, Conservation Programs on Military Reservations; DoD, in a cooperative plan with Department of the Interior (DOI) and State, opens AFBs to outdoor recreation, provides the state with a share of profits from sale of resources (timber), and conserves and rehabilitates wildlife, fish, and game on each reservation. Air Force is to manage the natural resources of its reservations to provide for sustained multipurpose use and public use.

16 USC 1451 to 1465; 1997; Coastal Zone Management Act of 1972; Federal agency activities in coastal zones should be consistent with state management plans to preserve and protect coastal zones. Lands for which the Federal Government has sole discretion or holds in trust are excluded from the coastal zone.

USC 1701 et seq., Public Law 94-579; 1997; Federal Land Policy and Management Act of 1976; Provides that the Sec. of Interior shall develop land use plans for public lands within Bureau of Land Management (BLM) jurisdiction to protect scientific, scenic, historical, ecological, environmental and archeological values, and to accommodate needs for minerals, food and timber.

16 USC 3501 to 3510; 1997; Coastal Barrier Resources Act; Limits Federal expenditure for activities on areas within the Coastal Barrier Resources System. An exception is for military activities essential to national security, after the Federal agency consults with the Secretary of the Interior.

Air Force Instruction 32-7062; 1-Oct-97 (certified current 13-Nov-09); Air Force Comprehensive Planning; Implements AFPD 32-70 by establishing Air Force Comprehensive Planning Program for development of Air Force Installations, ensuring that natural, cultural, environmental, and social science factors are considered in planning and decision making.

Air Force Instruction 32-7063; 13-Sep-05 (certified current 17-Nov-09); Air Installation Compatible Use Zone Program (AICUZ); Provides a framework to promote compatible

development within area of AICUZ area of influence and protect Air Force operational capability from the effects of land use which are incompatible with aircraft operations.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; Provides for development of an integrated natural resources management plan (INRMP) to manage the installation ecosystem and integrate natural resources management with the rest of the installation's mission. Includes physical and biological resources and uses.

Noise

42 USC 4901 to 4918, Public Law 92-574; 1972; Noise Control Act of 1972; Provides that each federal agency must comply with federal, state, interstate and local requirements for control and abatement of environmental noise.

49 USC 44715; 1997; Controlling Aircraft Noise and Sonic Boom; Provides that the Federal Aviation Administration will issue regulations in consultation with the U.S. Environmental Protection Agency (USEPA) to control and abate aircraft noise and sonic boom.

Executive Order 12088; 1978; Federal Compliance with Pollution Control Standards; Requires the head of each executive agency to take responsibility for ensuring all actions have been taken to prevent, control, and abate environmental (noise) pollution with respect to federal activities.

Air Force Instruction 32-7063; 13-Sep-05 (certified current 17-Nov-09); AICUZ; The AICUZ study defines and maps noise contours. Update when noise exposure in air force operations results in a change of Day-Night Average Sound Level of 2 decibels (dBs) or more as compared with the noise contour map in the most recent AICUZ study.

Water Resources

33 USC 426, 577, 577a, 595a; 1970; River and Harbor Act of 1970; Keeps navigable waterways open, authorizing the Army Corps of Engineers to investigate and control beach erosion and to undertake river and harbor improvements.

33 USC 1251 et seq.; 1997; Clean Water Act (CWA) (Federal Water Pollution Prevention and Control Act, FWPCA); In addition to regulating navigable water quality, the CWA establishes National Pollution Discharge Elimination System (NPDES) permit program for discharge into surface waters and storm water control; U.S. Army Corps of Engineers permit and state certification for wetlands disturbance; regulates ocean discharge; sewage wastes control; and oil pollution prevention.

33 USC 1344-Section 404; 1997; FWPCA/CWA, Dredged or Fill Permit Program; Regulates development in streams and wetlands by requiring a permit from the Army Corps of Engineers for discharge of dredged or fill material into navigable waters. A Section 401 (33 USC 1341) Certification is required from the State as well.

42 USC 300f et seq.; 1997; Safe Drinking Water Act (SDWA); USEPA - Requires the promulgation of drinking water standards, or Maximum Contaminant Levels, which are often

used as cleanup values in remediation; establishes the underground injection well program; and establishes a wellhead protection program.

42 USC 6901 et seq.; 29-May-05; Resource Conservation and Recovery Act of 1976 (RCRA); Establishes standards for management of hazardous waste (HW) so that water resources are not contaminated: RCRA Corrective Action Program requires cleanup of ground water that has been contaminated with hazardous constituents.

42 USC 9601 et seq., Public Law 96-510; 11-Dec-80; Comprehensive Environmental Response, Compensation, and Liability Act of 1980; Establishes the emergency response and remediation program for water and ground water resources contaminated with hazardous substances.

Executive Order 12114, 44 FR, No. 62; 01-04-79; Environmental Effects Abroad of Major Federal Actions. Activities outside the jurisdiction of the U.S. which significantly harm the natural or physical environment shall be evaluated. An EIS shall be prepared for major federal actions having significant environmental effects within the global commons (i.e., Antarctica, oceans).

Department of Defense Directive 6050.7; 31-Mar-79 (certified current 5-Mar-04); Environmental Effects Abroad of Major Department of Defense Actions. Implements Executive Order 12114.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements CWA, SDWA, and Water Quality Act of 1987.

Air Force Instruction 32-7006; 29-Apr-94 (certified current 11-May-10); Environmental Program in Foreign Countries; Implements DoD Directive 6050.7.

Air Force Instruction 32-7041; 10-Dec-03 (certified current 28-Jan-10); Water Quality Compliance; Instructs the Air Force on maintaining compliance with the CWA; other federal, state, and local environmental regulations; and related DoD and Air Force water quality directives.

Air Force Instruction 32-7041, Eglin Air Force Base (AFB) Supplement; 16-Jun-10; Water Quality Compliance; This supplement applies to all units assigned or attached to Eglin AFB, to include any associate/tenant organizations and off-base and remote site units. This supplement should be read in conjunction with AFI 32-7041, Water Quality Compliance.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; Sets forth requirements for addressing wetlands, floodplains and coastal and marine resources in an INRMP for each installation.

F.S. Chapters 253, 258; Florida Aquatic Preserves Act; Establishes state aquatic preserves.

F.S. Chapter 403, Part I; Florida Air and Water Pollution Control Act; establishes the regulatory system for water resources in the State of Florida.

FAC Chapters 62-302; Surface Water Quality Standards; Classify Florida surface waters by use. Identify Outstanding Florida Waters.

FAC Chapters 62-312; Florida Dredge and Fill Activities; Requires a State permit for dredging and filling conducted in, on, or over the surface waters of the State.

Biological Resources

Animal Resources

16 USC 668 to 668d; 1995; Bald and Golden Eagle Protection Act; Makes it illegal to take, possess, sell, barter, offer to sell, transport, export or import Bald and Golden eagles in the United States. Taking may be allowed for scientific, exhibition, or religious purposes, or for seasonal protection of flocks.

16 USC 703 - 712; 1997; Migratory Bird Treaty Act; Makes it illegal to take, kill or possess migratory birds unless done so in accordance with regulations. An exemption may be obtained from the DOI for taking a listed migratory bird.

16 USC 1361 et seq.; 1997; Marine Mammal Protection Act (MMPA) of 1972, as amended; Makes it illegal for any person to "take" a marine mammal, which term includes significantly disturbing a habitat, unless activities are conducted in accordance with regulations or a permit.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; Explains how to manage natural resources on Air Force property, and to comply with federal, state, and local standards for resource management.

Executive Order 13112; 1999; Instructs federal agencies to monitor for, control, and prevent the introduction of non-native, invasive species of plants and animals.

Executive Order 13186; 2001; Directs federal agencies whose actions may affect migratory birds to establish and implement a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds.

DoD and USFWS MOU; 31-Jan-06; Requires the DoD to acquire permits for normal and routine operations, such as installation support functions, that may result in pursuit, hunting, taking, capturing, killing, possession, or transportation of any migratory bird.

50 CFR 21; 2007; Exempts the Armed Forces from the incidental taking of migratory birds during military readiness activities, except in cases where an activity would likely cause a significant adverse effect on the population of a migratory bird species. In this situation, the Armed Forces, in cooperation with the USFWS, must develop and implement conservation measures to mitigate or minimize the significant adverse impacts.

Threatened & Endangered Species.

16 USC 1361 et seq., Public Law 92-574; 1997; MMPA of 1972, as amended; Makes it illegal for a person to "take" a marine mammal, which term includes significantly disturbing the habitat, unless done in accordance with regulations or a permit.

16 USC 1531 to 1544-16 USC 1536(a); 1997; Endangered Species Act 1973 (ESA); Federal agencies must ensure their actions do not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the habitat of such species and must set up a conservation program.

50 CFR Part 402; ESA Interagency Cooperation; These rules prescribe how a federal agency is to interact with either the USFWS or the National Marine Fisheries Service in implementing conservation measures or agency activities.

50 CFR Part 450; Endangered Species Exemption Process; These rules set forth the application procedure for an exemption from complying with Section 7(a)(2) of the ESA, 16 USC 1536(a)(2), which requires that federal agencies ensure their actions do not affect endangered or threatened species or habitats.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements ESA.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; This AFI directs an installation to include in its INRMP procedures for managing and protecting endangered species or critical habitat, including State-listed endangered, threatened or rare species; and discusses agency coordination.

Human Safety

29 CFR 1910.120; Occupational Safety and Health Act, Chemical Hazard Communication Program; Requires that chemical hazard identification, information and training be available to employees using hazardous materials (HM) and institutes material safety data sheets which provide this information.

Department of Defense Instruction 6055.1; 19-Aug-98; Establishes occupational safety and health guidance for managing and controlling the reduction of radio frequency exposure.

Department of Defense Flight Information Publication; Identifies regions of potential hazard resulting from bird aggregations or obstructions, military airspace noise sensitive locations, and defines airspace avoidance measures.

Air Force Instruction 13-212; 16-Nov-07 (incorporating change 10-Jul-08; certified current 6-Jan-10); Weapons Ranges and Weapons Range Management; Establishes procedures for planning, construction, design, operation, and maintenance of weapons ranges as well as defines

weapons safety footprints, buffer zones, and safest procedures for ordnance and aircraft malfunction.

Air Force Instruction 32-2001; 9-Sep-08; The Fire Protection Operations and Fire Prevention Program; Identifies requirements for Air Force fire protection programs (equipment, response time, and training).

Air Force Instruction 32-7063; 13-Sep-05 (certified current 17-Nov-09); AICUZ. The AICUZ Study defines and maps accident potential zones and runway clear zones around the installation, and contains specific land use compatibility recommendations based on aircraft operational effects and existing land use, zoning and planned land use.

Air Force Manual 91-201; 12-Jan-11; Explosives Safety Standards; Regulates and identifies procedures for explosives safety and handling as well as defining requirements for ordnance quantity distances, safety buffer zones, and storage facilities.

Air Force Instruction 91-301; 1-Jun-96; Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program); Identifies occupational safety, fire prevention, and health regulations governing Air Force activities and procedures associated with safety in the workplace.

Habitat Resources

Executive Order 11990; 24-May-77; Protection of Wetlands; Requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in their activities. Construction is limited in wetlands and requires public participation.

Executive Order 11988; 24-May-77; Floodplain Management; Directs federal agencies to restore and preserve floodplains by performing the following in floodplains: not supporting development; evaluating effects of potential actions; allowing public review of plans; and considering in land and water resource use.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Executive Orders (EOs) 11988 and 11990.

Anthropogenic Resources

Hazardous Materials

7 USC 136 et seq., Public Law 92-516; 1997; Federal Insecticide, Fungicide, and Rodenticide Act. Insecticide and Environmental Pesticide Control; Establishes requirements for use of pesticides that may be relevant to activities at Eglin AFB.

42 USC Sect. 2011 - Sect. 2259; Atomic Energy Act; Assure the proper management of source, special nuclear, and byproduct material.

42 USC 6901 et seq.; 1980; Resource Conservation and Recovery Act of 1976 and Solid Waste Disposal Act of 1980 (RCRA); Subchapter III sets forth HW management provisions; Subchapter IV sets forth solid waste management provisions; and Subchapter IX sets forth underground storage tank provisions; with which Federal agencies must comply.

42 USC 9601 et seq., Public Law 96-510; 1997; Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended; Establishes the liability and responsibilities of federal agencies for emergency response measures and remediation when hazardous substances are or have been released into the environment.

42 USC 11001 to 11050; EPCRA; Provides for notification procedures when a release of a hazardous substance occurs; sets up community response measures to a hazardous substance release; and establishes inventory and reporting requirements for toxic substances at all facilities.

42 USC 13101 to 13109; 1990; Pollution Prevention Act of 1990 (PPA); Establishes source reduction as the preferred method of pollution prevention, followed by recycling, treatment, then disposal into the environment. Establishes reporting requirements to submit with EPCRA reports. Federal agencies must comply.

Air Armament Center Plan 32-3; January 2004; Asbestos Management Plan; This plan establishes procedures for the Eglin AFB facility asbestos management program. It contains the policies and procedures used in controlling the health hazards created by asbestos containing materials (ACM), and the procedures used in ACM removal required to protect the health of personnel and to comply with applicable federal, state, and Air Force laws and inspections.

Air Armament Center Plan 32-4; January 2004. Lead-Based Paint Management Plan; This plan establishes procedures for the Eglin AFB lead- based paint management program. It contains policies and procedures used in controlling health hazards from exposure to lead-based paint.

Air Armament Center Plan 32-7; February 2003; Integrated Solid Waste Management Plan; The Eglin AFB Integrated Solid Waste Management Plan documents guidance and procedures with regard to regulatory compliance in the handling, reduction, recycling and disposal of solid waste. It contains requirements necessary to reach the mandated incremental waste diversion goal of 40-percent diversion of municipal solid waste from landfill disposal by fiscal year 2005. These policies and procedures are designed to preserve landfill space, increase recycling and reuse, address revenues and cost avoidance, provide pollution prevention alternatives and promote Affirmative Procurement. This plan draws from the aspects of two programs, the Integrated Solid Waste Management Program and the Qualified Recycling Program.

Air Armament Center Plan 32-9; February 2003; Hazardous Materials Management Plan; The Eglin AFB Hazardous Material Management Plan documents existing policy and procedures for organizations requesting, procuring, issuing, handling, storing and disposing of HM in accomplishment of the Air Armament Center (AAC) mission. These policies provide guidance for compliance with federal, state, and local occupational safety, health, and environmental regulations.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Provides for developing and implementing an Air Force Environmental Quality Program composed of four pillars: cleanup, compliance, conservation and pollution prevention. Implements Resource Recovery and Conservation Act, Comprehensive Environment Response Compensation and Liability Act of 1980, EPCRA, PPA, EO 12088, EO 12777, and EO 12586. Implements DoD Instruction 4120.14, DoD Directive 4210.15, and DoD Directive 5030.41.

Eglin AFB Instruction 32-7003; 1-Nov-2010; Hazardous Waste Management; This instruction is intended to provide a framework for complying with environmental standards applicable to HW, Universal Waste, Special Waste and used petroleum products on Eglin AFB.

Air Force Instruction 32-7020; 7-Feb-01; The Environmental Restoration Program (ERP); Introduces the basic structure and components of a cleanup program under the Defense ERP. Sets forth cleanup program elements, key issues, key management topics, objectives, goals, and scope of the cleanup program.

Air Force Instruction 32-7042; 15-Apr-09 (incorporating change 31-Mar-10); Waste Management; Provides that each installation must develop an HW and a solid waste (SW) management plan; characterize all HW streams; and dispose of them in accordance with the AFI. Plans must address pollution prevention as well.

Air Force Instruction 32-7042, Eglin Air Force Base Supplement; 28-Jan-10; Waste Management; Serve as the Solid Waste Management plan required by AFI 32-7042, *Solid and Hazardous Waste Compliance*, and applies to all agencies and organizations on Eglin AFB, all personnel living in military family housing and contractors performing work under government contracts. Although the parent AFI also addresses HW, this supplement concerns only non-hazardous solid waste.

Air Force Instruction 32-7080; 12-May-94 (certified current 27-Oct-09); Pollution Prevention Program; Each installation is to develop a pollution prevention management plan that addresses ozone depleting chemicals; USEPA 17 industrial toxics; hazardous and solid wastes; obtaining environmentally friendly products; energy conservation, and air and water.

Air Force Policy Directive 40-2; 15-Mar-07; Radioactive Materials; Establishes policy for control of radioactive materials, including those regulated by the U.S. Nuclear Regulatory Commission, but excluding those used in nuclear weapons.

Cultural Resources

16 USC 431 et seq.; PL 59-209; 34 Stat. 225; 43 CFR 3; 1906; Antiquities Act of 1906; Provides protection for archeological resources by protecting all historic and prehistoric sites on Federal lands. Prohibits excavation or destruction of such antiquities without the permission (Antiquities Permit) of the Secretary of the department that has the jurisdiction over those lands.

16 USC 461 to 467; 1997; Historic Sites, Buildings and Antiquities Act; Establishes national policy to preserve for public use historic sites, buildings and objects of national significance: the

Secretary of the Interior operates through the National Park Service to implement this national policy.

16 USC 469 to 469c-1; 1997; Archaeological and Historic Preservation Act of 1974; Directs Federal agencies to give notice to the Sec. of the Interior before starting construction of a dam or other project that will alter the terrain and destroy scientific, historical or archeological data, so that the Sec. may undertake preservation.

16 USC 470aa-470mm, Public Law 96-95; 1997-Supp; Archaeological Resources Protection Act of 1979 (ARPA); Establishes permit requirements for archaeological investigations and ensures protection and preservation of archaeological sites on federal and tribal lands. ARPA sets descriptions of prohibited activities in regards to cultural resources and provides financial and incarceration penalties for convicted violators.

16 USC 470 to 470w-6-16 USC 470f, 470h-2; 1997-Supp; National Historic Preservation Act (NHPA); The NHPA is our Nation's keystone federal law for historic preservation. Section 106 of NHPA is a planning process that requires Federal agencies to take into account the effects of their actions on historic properties, and provide the Advisory Council on Historic Preservation with a reasonable opportunity to comment on those actions. Section 106 regulations explicitly address NEPA (see 36CFR§800.8).

25 USC 3001 - 3013), (Public Law 101-601); 1997-Supp; Native American Graves Protection and Repatriation Act of 1991; provides for the rights of Native American lineal descendants, Indian tribes, and Native Hawaiian organizations with respect to the treatment, repatriation, and disposition of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, with which they can show a relationship of lineal descent or cultural affiliation.

42 USC 1996; 1994; American Indian Religious Freedom Act; Federal agencies are to make reasonable efforts to accommodate access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites in the practice of their traditional religions.

32 CFR Part 200; 1996; Protection of Archaeological Resources: Uniform Regulations; Implements ARPA; provides that no person may excavate or remove any archaeological resource located on public lands or Indian lands unless such activity is conducted pursuant to a permit issued under this Part or is exempted under this Part.

36 CFR Part 60; 1996; Nominations to National Register of Historic Places (National Register); Details how the federal agency Preservation Officer is to nominate properties to the National Park Service for consideration to be included on the National Register.

36 CFR Part 800; 5-Aug-04; Protection of Historic and Cultural Properties; Sets out the requirements of Section 106 of the NHPA: under these regulations Federal agencies must take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings.

Executive Order 11593, 16 USC 470; 13-May-71; Protection and Enhancement of the Cultural Environment; Instructs federal agencies to identify and nominate historic properties to the National Register, as well as avoid damage to Historic properties eligible for National Register

Executive Order 13007; 24-May-96; Directs federal agencies to provide access to and ceremonial use of sacred Indian sites by Indian religious practitioners as well as promote the physical integrity of sacred sites.

Department of Defense Directive 4715.16; 18-Sept-08; Cultural Resources Management; This Department of Defense Instruction (DoDI) establishes DoD policy and assigns responsibilities for DoD components (identified in the DoDI) to comply with applicable federal statutory and regulatory requirements, EOs, and Presidential memorandums for the integrated management of cultural resources on DoD-managed lands.

Department of Defense Directive DoDI 4710.02; 14-Sep-06; DoD; Interactions with Federally Recognized Tribes: This DoDI implements DoD policy, assigns responsibilities, and provides procedures for DoD branches' interactions with federally recognized tribes.

Air Force Instruction 32-7065; 1-Jun-04; Cultural Resource Management Program; Directs Air Force bases to comply with historic preservation requirements, and describes Air Force organizational responsibilities. The AFI provides guidance for principal actions associated with cultural resources compliance: Inventory, Project Review, and General Management.

AF Manual 126-5, Natural Resources, Outdoor Recreation, and Cultural Values; provides guidance, standards, and technical information on management of natural resources, outdoor recreational resources, and cultural resources.

APPENDIX B

AIR QUALITY SUPPLEMENTAL INFORMATION

AIR QUALITY SUPPLEMENTAL INFORMATION

This appendix provides a general overview of the federal and state regulatory air quality programs. Additionally, the appendix discusses emission factor development and calculations including assumptions employed in the air quality analyses presented in the Air Quality sections of this Range Environmental Assessment (REA).

AIR QUALITY PROGRAM OVERVIEW

In order to protect public health and welfare, the U.S. Environmental Protection Agency (USEPA) has developed numerical concentration-based standards or National Ambient Air Quality Standards (NAAQS) for six "criteria" pollutants (based on health-related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: primary and secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (Code of Federal Regulations, Title 40, Part 50 [40 CFR 50].

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Division of Air Resource Management within the Florida Department of Environmental Protection (FDEP) administers the state's air pollution control program under authority of the Florida Air and Water Pollution Control Act and the Environmental Protection Act.

Florida has adopted the NAAQS as written in the federal regulations (40 CFR Part 51), except Florida has established a more conservative standard for sulfur dioxide (SO_2). USEPA has set the annual and 24-hour standards for SO_2 at 0.03 parts per million (ppm) (80 micrograms per cubic meter [$\mu g/m^3$]) and 0.14 ppm (365 $\mu g/m^3$), respectively. Florida has adopted the more stringent annual and 24-hour standards of 0.02 ppm (60 $\mu g/m^3$) and 0.1 ppm (260 $\mu g/m^3$), respectively. In addition, Florida has adopted the national secondary standard of 0.50 ppm (1300 $\mu g/m^3$). Federal and State of Florida ambient air quality standards are presented in Table B-1 (Florida Administrative Code [FAC]).

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States (U.S.) as having air quality better than the NAAQS (attainment), worse than the NAAQS (nonattainment), and unclassifiable. Those areas that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. Attainment areas can be further classified as "maintenance" areas. Maintenance areas are those areas previously classified as nonattainment that have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state of Florida are in compliance with the NAAQS.

Table B-1. National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Federal Primary NAAQS(8)	Federal Secondary NAAQS(8)	*Florida Standards*
Carbon Monoxide (CO)	8-hour(1)	9 ppm (10 mg/m^3)	No standard	9 ppm (10 $\mu g/m^3$)
	1-hour(1)	35 ppm (40 mg/m^3)	No standard	35 ppm (40 $\mu g/m^3$)
Lead (Pb)	Quarterly	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)
Particulate Matter $\leq$10 Micrometers (PM_{10})	24-hour(2)	150 $\mu g/m^3$	150 $\mu g/m^3$	50 $\mu g/m^3$
Particulate Matter <2.5 Micrometers ($PM_{2.5}$)	Annual(3)	15 $\mu g/m^3$	15 $\mu g/m^3$	150 $\mu g/m^3$
	24-hour(4)	35$\mu g/m^3$	35 $\mu g/m^3$	15 $\mu g/m^3$
Ozone (O_3)	1-hour(7)	0.12 ppm (235 $\mu g/m^3$)	0.12 ppm (235 $\mu g/m^3$)	65 $\mu g/m^3$ 0.12 ppm
	8-hour(5)	0.075 ppm (2008 std)		(235 $\mu g/m^3$)
	8-hour(6)	0.08 ppm (1997 std) (157 $\mu g/m^3$)	0.08 ppm (157 $\mu g/m^3$)	
Sulfur Dioxide (SO_2)	Annual	0.03 ppm (80 $\mu g/m^3$)	No standard	0.02 ppm (60 $\mu g/m^3$)
	24-hour(1)	0.14 ppm (365 $\mu g/m^3$)	No standard	0.10 ppm (260 $\mu g/m^3$)
	1-hour(1)	75 ppb	0.50 ppm (1300 $\mu g/m^3$)	0.50 ppm (1300 $\mu g/m^3$)

Source: USEPA, 2011 (Federal Standards); FAC 62-204.240, 2006 (Florida Standards)
ppb = parts per billion; ppm = parts per million; FAC = Florida Administrative Code; mg/m^3 = milligrams per cubic meter; NAAQS = National Ambient Air Quality Standards; $\mu g/m^3$ = micrograms per cubic meter; USEPA = U.S. Environmental Protection Agency
(1) Not to be exceeded more than once per year
(2) Not to be exceeded more than once per year on average over 3 years
(3) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.
(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
(5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
(6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard, and the implementation rules for that standard, will remain in place for implementation purposes as the USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
(b) As of June 15, 2005 the USEPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

Each state is required to develop a state implementation plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state, and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the

SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

Florida has a statewide air quality-monitoring network that is operated by the state *FDEP State Air Monitoring Reports* (FDEP, 1996). Ambient air quality data from these monitors are used to assess the regions' air quality in comparison to the NAAQS. The air quality is monitored for carbon monoxide (CO), lead, nitrogen dioxide, ozone, particulate matter (PM) and sulfur dioxide. The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards; also included are areas where the ambient standards are being met, but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality exceedances of the NAAQS as well as pollutant trends.

The FDEP Northwest District operates monitors in several northwest counties, including Bay, Escambia, and Santa Rosa Counties. Over the years of record there have been exceedances (pollutant concentration greater than the numerical standard) of the NAAQS. However, there has not been a violation (occurrence of more exceedances of the standard than is allowed within a specified time period) of an ambient standard *(FDEP State Air Monitoring Reports).* Currently, all areas in the state of Florida are attainment for all criteria pollutants.

PROJECT CALCULATIONS: AIR EMISSIONS OF CRITERIA POLLUTANTS

Regulatory Compliance Methodologies

Mission-generated air emissions were analyzed to enable comparison to NAAQS and to the cumulative impact to the air shed within the affected Region of Influence (ROI). Activities occurring within the test areas that have the greatest potential to impact air quality are munitions and vehicle activities including particulate emissions that result from the dust of unpaved roads and trails. Aircraft emissions have been omitted from this REA, since all aircraft emissions are addressed in the Air Operations Environmental Baseline Document (EBD) (U.S. Air Force, 2006). In order to conservatively estimate the potential impact of these operations with short-term ambient air quality, a Closed Box Assessment (CBA) was performed. Additionally, the annual emissions were compared with the USEPA 2008 National Emissions Inventory (NEI) for the ROI. Both techniques are described below, as well as the emissions calculations and project assumptions.

The Closed Box Assessment

The CBA provides a means to estimate maximum short-term impacts from emissions in a given element of space. Several assumptions are incorporated into this technique. First, it assumes that emissions are homogeneously mixed and contained within a defined volume of space throughout which the activities occur. For this assessment, this volume of air is defined by vertical and lateral boundaries. The vertical boundary of altitude established was 3,000 feet above sea level, and the dimensional area within each of the test areas was utilized for lateral boundaries.

Second, the CBA assumes that the calculated concentrations within the defined box of criteria pollutants resulting from the operations are representative activities of the maximum resultant ground-level (i.e., sea-level) concentrations. Because of these assumptions, the results of these calculations are expected to indicate somewhat higher air quality impacts than those that would result from a more structured dispersion model. However, the results do provide a maximum impact scenario for comparison with established ambient air quality standards.

For this assessment, it was assumed that activities occurring within each of the test areas operated randomly. The ceiling altitude of 3,000 feet was chosen as a conservative estimate of the average height for stable temperature inversion common to the area. This type of inversion can significantly inhibit, if not effectively block, vertical mixing and widespread dispersion of some air pollutants. Therefore, pollutants can be considered confined between the base of the inversion and the ground, or that portion of the lower atmosphere commonly termed the mixing layer. The mixing-layer height determines the vertical extent of the dispersion process for pollutant releases below the mixing height.

A conservative one-hour scenario was developed encompassing the individual emissions associated with mobile sources as well as ordnance and munitions activities. The scenario assumes that all activities within the year occurred during the same time frame. These calculated one-hour emissions contributions were then compared with the appropriate NAAQS. For averaging times greater than one hour, the maximum concentration generally will be less than the calculated one-hour value. The comparison is limited to those criteria pollutants directly associated with range activities.

Ordnance Detonation Calculations

Emissions from munitions expended on each of the test areas were calculated based on surrogate munitions from each category of munitions expended on the test areas. Table B-2 shows the surrogates and their Net Explosive Weight (NEW) used in this analysis.

Table B-2. Munitions Surrogates Used for the Air Quality Analysis

Munitions Category	Nomenclature	NSN	DODIC	NEW (lb)
Gun - Live	CTG 25MM TP PGU-23/U	1305013907977	A978	0.176299
Miscellaneous Expenditure	SIGNAL ILLUM GRND PARA WHT STAR M127A1	1370013415159	SY16	0.0001
Missile	CHG DEMO M112	1375013300749	M023	1.138000
Flare	CTG IMPULSE BBU-35/B	1377010378651	MG62	0.000742
Small Arms - Inert	CTG 5.56MM BLK M200 LNKD	1305011555463	A075	0.000840
Small Arms - Live	CTG 5.56 MM TR M196	1305009144719	A068	0.003791
Smoke	GREN HAND SMK GRN M18	1330002896851	G940	0.00053
Bomb-inert	CTG SIGNAL PRAC BOMB CXU 3A/B	1325010884217	F470	0.000126
Explosives	HIGH EXPL M<ATL (COMP C4)	NONE	NONE	0.910000
Gun - Inert	CTG 40MM PRAC M407A1	1310009650738	B577	0.002003
Bomb - Live	BOMB GP 500LB MK82 MOD1	1325002944152	E480	153.6
Rockets	RCKT POD 298MM PRAC REDUCED RANGE M28A1	1340013709666	H185	0.000569

DODIC = Department of Defense Identification Code; lb = pound(s); NEW = net explosive weight; NSN = National Stock Number

The equation used to calculate emissions is as follows:

Where:

Epol = pollutant Emissions
EF = Emissions Factor
Qnty = Quantity of munitions used
NEW = Net Explosive Weight

EPA developed emissions factors for ordnance detonation were used (USEPA, 2012).

Vehicle Exhaust Calculations

Vehicle exhaust calculations were developed using emissions factors established by USEPA for various vehicle classes. The unit of measure for the vehicle emissions factors is represented in grams per vehicle mile traveled. These factors were correlated with the total vehicle mileage traveled in each of the test areas.

Vehicles associated with mission activities were classified into two categories, gas and diesel powered. Previously, it has been determined that over 90 percent of the Eglin Range vehicular traffic is gasoline powered, while the remainder, over 9 percent, is composed of diesel.

Total road miles and average total vehicle road mileage traveled on Eglin Air Force Base's (AFB) ranges were ascertained from the Range Road EBD (U.S. Air Force, 2003). The total

road miles within each test area was compared with the total Eglin Range road miles and converted to a percentage. It was assumed that the percentage of road miles that compose each test area was a direct correlation with the vehicle miles traveled within each test area. This provides a conservative estimate of vehicle miles traveled.

Using the assumptions described, the vehicle miles traveled for the individual classes of vehicles were extrapolated. Emissions were ascertained utilizing the emission factors and mathematical expression provided below.

Table B-3 below contains the emission factors for each vehicle class.

Emissions (tons/yr) = (RRM/TRRM) x TAYVM x EF x CF1
Emissions ($\mu g/m^3$ x hr) = (RRM/(TRRM x TV) x TAYVM x EF x CF_2

Where:

RRM = Range Road Miles (total miles for given range)
TRRM = Total Range Road Miles (Eglin AFB's total range road miles)
TAYVM = Total Average Yearly Vehicle Miles traveled on Eglin AFB's ranges
TV = Closed Box Volume
EF = Emission Factor
CF_1 = Conversion Factor (1.1E-6)
CF_2 = Conversion Factor (3.6E5)

CF_1 converts from grams to pounds, and then to tons. CF_2 converts into micrograms and weights the value over an hour.

Table B-3. Vehicle Emission Factors

Emission Factors (g/mi)	CO	SO_x	NO_x	PM	VOC
Classes I, II	25	0.11	2.7	2.9	2.8
Classes III, IV	5	0.26	3.6	3.4	1.2

CO = carbon monoxide; g/mi = grams per vehicle mile traveled; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Vehicle Dust Emissions

When vehicles travel on unpaved roads, PM is emitted into the air. In order to determine the amount of total suspended particulate matter due to the activities on unpaved roads, several variables must be defined, such as percent surface silt content, mean vehicle weight (tons), mean vehicle speed (miles per hour [mph]), mean number of wheels per vehicle, and some constants.

Silt content was assumed to be a conservative value of 5 percent due to Florida's very low material surface silt content (USEPA, 2006). The mean weight of the vehicles traveling on the unpaved roads were determined to be 3 tons, since 91 percent of the vehicles traveling on the roads are considered classes I and II, which are mainly light trucks, cars, and suburban-type vehicles with weights ranging from 1.0 to 5.0 tons. Mean vehicle speed was deemed 35 mph;

this value was based on previous studies, road conditions, and safety precautions considered when driving on unpaved roads. The variables and assumptions stated above along with the equation below were derived assuming dry road conditions (USEPA, 2006).

The following empirical expression was used to estimate the amount in pounds of PM emitted from the unpaved road due to vehicle traffic.

$$E=[k(s/12)^{a}(S/30)^{d}]/[(M/0.5)^{c}]-C$$

Where:

E = emissions in (lb)
K = particle size multiplier
s = silt content on road surface (%)
S = mean vehicle speed (mph)
W = mean number of wheels per vehicle
M = Moisture content
a,c, & d = constants (USEPA, 2006)

CUMULATIVE IMPACT COMPARISON

In order to evaluate the range emissions and their impact to the overall ROI, which is defined as Okaloosa and Santa Rosa Counties for this document's purposes, the emissions associated with the range activities were compared with the total emissions on a pollutant-by-pollutant basis for the ROI's 2008 NEI data. Potential impacts to air quality are identified here as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent criterion approach was used in the USEPA's General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. The U.S. Environmental Protection Agency made revisions to the General Conformity Regulations on March 24, 2010. These final revisions remove the requirements for federal agencies to conduct conformity determinations for "regionally significant" actions. Such actions have emissions greater than 10 percent of the emissions inventory for a nonattainment area. However, this criterion will still be used in this analysis for the purposes of discussion and comparison.

In accordance with Section 176(c) of the CAA, USEPA promulgated the General Conformity Rule that is codified at 40 CFR 51, Subpart W. The provisions of this rule apply to state review of all federal actions submitted pursuant to 40 CFR 51, Subpart W, and incorporated by reference at Rule 62-204.800, FAC. The Conformity Rule only affects federal actions occurring in nonattainment areas (areas that do not meet the NAAQS) and maintenance areas (areas that were classified as nonattainment but now are in attainment). Since the Proposed and Alternative Actions are located in attainment areas, Eglin AFB would not be required to prepare a conformity determination for the activities described. However, the general concept of the conformity rule was used as a criterion, although not necessary.

For impacts screening in this analysis, however, a more restrictive criteria than required in the General Conformity Rule was used. Rather than comparing emissions from test activities to regional inventories (as required in the General Conformity Rule), emissions were compared with the individual counties potentially impacted, which is a smaller area.

National Emissions Inventory

The NEI is operated under USEPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous state and local air agencies, from tribes, as well as from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants (HAPs). The database includes estimates of annual emissions, by source, of air pollutants in each area of the country, on an annual basis. The NEI includes emissions estimates for all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Emissions estimates for individual points or major sources (facilities), as well as county level estimates for area, mobile, and other sources, are available currently for years 1996, 1999, 2002, and 2008 for criteria pollutants and HAPs.

Criteria air pollutants are those for which USEPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database:

- CO.
- Nitrogen oxides (NO_x).
- SO_2.
- PM_{10} (PM less than or equal to 10 microns in diameter) and $PM_{2.5}$ (PM less than or equal to 2.5 microns in diameter).

The NEI also includes emissions of volatile organic compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with NO_x in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources.

- Point sources - Stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A "major" source emits a threshold amount (or more) of at least one criteria pollutant and must be inventoried and reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.
- Area sources - Small point sources such as a home or office building, or a diffuse stationary source, such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example (i.e., a single dry cleaner within an inventory area typically will not qualify as a point source), but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.
- Mobile sources - Any kind of vehicle or equipment with a gasoline or diesel engine, airplane, or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units – USEPA's Emission Tracking System/Continuous Emissions Monitoring Data and Department of Energy fuel use data.
- For other large stationary sources - State data and older inventories where state data was not submitted.
- For on-road mobile sources - The Federal Highway Administration's estimate of vehicle miles traveled and emission factors from USEPA's MOBILE Model.
- For non-road mobile sources – USEPA's NONROAD Model.
- For stationary area sources - State data, USEPA-developed estimates for some sources, and older inventories where state or USEPA data was not submitted.

State and local environmental agencies supply most of the point source data. USEPA's Clean Air Market program supplies emissions data for electric power plants.

Greenhouse Gases and Climate Change

This section describes the current and pending federal, state, and Air Force regulations that have driven the greenhouse gas (GHG) inventory effort at Eglin AFB to date as well as the methodology used in doing the analysis.

Federal Regulations

Executive Order (EO) 13423: EO 13423 (January 24, 2007) required federal agencies to meet specific goals to improve energy efficiency and reduce GHG emissions by reducing energy intensity by 3 percent annually through the end of fiscal year (FY) 2015, or by 30 percent by the end of FY 2015, relative to the baseline of the agency's energy use in FY 2003.

House of Representatives (H.R.) 2764 (Public Law 110-161): In the FY 2008 Consolidated Appropriations Act, Congress directed the USEPA to publish a mandatory GHG reporting rule, using the agency's existing authority under the CAA. Congress requested that the USEPA include reporting of emissions to the extent that the agency deems appropriate.

40 CFR 86, 87, 89: The USEPA published 40 CFR 86, 87, 89, et al. on October 30, 2009 (USEPA, 2009) with an effective date of December 29, 2009. Eglin AFB would be required to report GHG emissions if it meets the qualifications described in 40 CFR 98.2(3) (ii) and (iii). That ruling states that GHG emissions must be inventoried and reported by any facility that emits 25,000 metric tons of CO_2e or more per year from all stationary fuel combustion sources and has an aggregate maximum rated heat input capacity of its stationary fuel combustion units of 30 million British thermal units per hour (USEPA, 2009).

EO 13514: On October 5, 2009, the President issued an EO requiring that, within 90 days of the order, each agency shall report to the Chair of the Council on Environmental Quality a percentage reduction target for agency-wide reductions of scope 1 and scope 2 GHG emissions in absolute terms by FY 2020 and, within 240 days of the order, a target for agency-wide scope 3 GHG emissions, relative to FY 2008 baseline of the agency's scope 1, 2, and 3 GHG emissions.

State Regulations

Florida Governor Charlie Crist signed three EOs regarding GHG emissions in 2007:

- EO 07-126 requires state government to measure their GHG emissions and work to reduce emissions by 10 percent by 2012, 25 percent by 2017, and 40 percent by 2025.
- EO 07-127 directed the adoption of maximum emission levels of GHGs for electric utilities requiring a reduction of emissions to year 2000 levels by 2017, to year 1990 levels by 2025, and by 80 percent of year 1990 levels by 2050.
    - Florida would also adopt the California motor vehicle emission standards of 22 percent reduction in vehicle emissions by 2012 and a 30 percent reduction by 2016, pending approval of the USEPA waiver.
- EO 07-128 creates a Governor's Action Team on Climate Change that would be responsible for producing a Florida Climate Change Action Plan that will include strategies beyond the EOs to reduce emissions, including recommendations for proposed legislation for consideration during the 2008 Legislative Session and beyond.

Currently Florida does not have a set standard or rule regarding GHG emission reporting. FDEP initiated three rulemaking projects aimed at reducing Florida's GHG emissions:

- Rules to reduce GHG emissions from electric utilities.
- Adoption of the California motor vehicle emissions standards.
- Developing a diesel idle reduction standard.

PROJECT CALCULATIONS: AIR EMISSIONS OF GREENHOUSE GASES

The six primary greenhouse gases that are internationally recognized and regulated under the Kyoto Protocol are:

- Carbon dioxide (CO_2).
- Methane (CH_4).
- Nitrous oxide (N_2O).
- Hydrofluorocarbons (HFCs).
- Perfluorocarbons (PFCs).
- Sulfur hexafluoride (SF_6).

Emissions of CO_2, CH_4, and N_2O were analyzed in this document as the source of GHGs were primarily from vehicles used on the range and from ordnance detonation (only CO_2 and CH_4).

The following data was required to calculate the emissions for on-road highway vehicles:

- Vehicle class.
- VMT.
- Fuel type.
- Average model year.
- Average fuel efficiency.
- Emission factor.
- Global warming potentials.

Emission Calculation Algorithms

Emissions from on-road highway vehicles were calculated by multiplying the fuel consumption by the appropriate emission factor.

$$Epol = [(EF \times FC \times GWP)/2{,}000]*0.90718$$

Where:

Epol = Emissions of a particular pollutant (metric tons CO2e)
EF = Emission Factor (lb/gal)
FC = Fuel Consumption (gallons)
GWP = Global Warming Potential
2,000 = Conversion from pounds to short tons
0.90718 = Conversion from short tons to metric tons

Table B-4 shows the Global Warming Potentials used.

Table B-4. Global Warming Potentials

Pollutant	GWP
CO_2	1
CH_4	21
N_2O	310

Source: IPCC, 2007

Emission factors for CO_2 are provided in Table B-5 and emission factors for CH4, and N_2O and are provided in Table B-6.

Table B-5. CO_2 Emission Factors for On-Road Highway Vehicles

GHG	Emission Factor (lb/gal)
Motor Gasoline	
CO_2	19.4224
Diesel	
CO_2	22.3765

Source: AFMC, 2009
CO_2 = carbon dioxide; GHG = greenhouse gas; lb/gal = pounds per gallon

Table B-6. Emission Factors for CH_4 and N_2O for On-Road Highway Vehicles

Vehicle Class	GHG	Emission Factor (lb/gal)
Motor Gasoline		
Class 1	CH_4	1.6152 × 10-3
	N_2O	1.4664 × 10-3
Class 2	CH_4	1.4317 × 10-3
	N_2O	1.0485 × 10-3
Diesel		
Class 3	CH_4	7.1429 × 10-5
	N_2O	3.5714 × 10-5
Class 4	CH_4	6.4815 × 10-5
	N_2O	4.3210 × 10-5

Source: AFMC, 2009
CH4 = methane; GHG = greenhouse gas; lb/gal = pounds per gallon; N2O = nitrous oxide

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APPENDIX C

BIOLOGICAL RESOURCES

BIOLOGICAL RESOURCES

SENSITIVE SPECIES

Amphibians

Reticulated Flatwoods Salamander (*Ambystoma bishopi*)

The reticulated flatwoods salamander is state and federally listed as endangered. Based on molecular and morphological analyses, there is a proposal to separate the flatwoods salamander into two species. The division lies along the Apalachicola-Flint Rivers with reticulated flatwoods salamanders (*Ambystoma bishopi*) inhabiting areas to the west and frosted flatwoods salamanders (*A. cingulatum*, federally threatened) ranging to the east of the rivers. There are 20 known breeding ponds for the flatwoods salamander on the Eglin Range. Additionally, the Eglin Range supports approximately 17,000 acres of potential salamander habitat in mesic flatwoods. On 10 February 2009 the USFWS issued a notification in the *Federal Register* that no critical habitat would be designated for the reticulated flatwoods salamander on Eglin Air Force Base (AFB) (*Federal Register*, 2009).

Optimal habitat for this small mole salamander is open, mesic (moderately wet) woodlands of longleaf or slash pine flatwoods maintained by frequent fires and that contain shallow, ephemeral wetland ponds. Males and females migrate to these ephemeral ponds during the cool, rainy months of October through December. 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 (U.S. Air Force, 2006).

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. Flatwoods salamander habitat is also threatened by the introduction of invasive, non-native species. Flatwoods salamanders and their active breeding wetlands both appear to have declined in number since the original Eglin AFB surveys in 1993 and 1994. This is possibly due in part to several years of drought in the late 1990s and early 2000s. Wetlands used for breeding may not have remained wet long enough for larvae to complete metamorphosis if rainfall amounts were not sufficient. This has resulted in little population recruitment over the last decade at Eglin AFB's wetlands (U.S. Air Force, 2006).

The USFWS guidelines in the *Federal Register*, dated 1 April 1999, establish a 450-meter (1,476-foot) buffer area from the wetland edge of confirmed breeding ponds. Within the buffer area, the guidelines restrict ground-disturbing activities in order to minimize the potential for direct impacts to salamanders, the introduction and spread of invasive non-native plant species, and alterations to hydrology and water quality.

Gopher Frog (*Rana capito*)

The gopher frog is listed as a species of special concern by the State of Florida. These frogs typically are 2.5 to 4 inches long, excluding their legs, and have a wide body characterized by cream-colored, gray, or brown blotches. Their chin and throat are spotted, and the belly is

usually plain. Gopher frogs prefer habitats of the sandhills ecological association and typically are found in dry, sandy uplands. They are nocturnal and spend most of the day in tunnels or gopher tortoise burrows. Breeding occurs in ponds and other permanent water bodies. The gopher frog is found throughout Florida, with the exception of the Everglades and the Keys.

Florida Bog Frog (*Rana okaloosae*)

The Florida bog frog is listed as a species of special concern by the State of Florida. This species has recently been proposed for reclassification into the genus *Lithobates*. The bog frog is the smallest member of this genus, slightly exceeding 2 inches in length (FWC, 2011a). These frogs typically are yellowish-green to brown on the back, with a yellowish belly and yellowish-green upper lip and throat. The species occurs only in small streams in Walton, Okaloosa, and Santa Rosa counties, Florida, and is known from fewer than 100 sites. The bog frog has been found in several aquatic habitats including spring seeps, boggy overflows of larger seepage streams, sluggish bends in streams, and pond edges. They are frequently associated with sphagnum moss (*Sphagnum* spp.). Most of the habitat for the frog lies on Eglin AFB property with all known locations of the frog in small tributary streams of the Yellow, Shoal, and East Bay Rivers

Reptiles

Eastern Indigo Snake (*Drymarchon corais couperi*)

The eastern indigo snake, federally and state-listed as threatened, is the largest nonvenomous snake in North America and can grow up to 125 inches in length. The primary reason for its listing is population declines resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats also exposes the snake to danger from increased contact with humans. Indigo snakes frequently utilize gopher tortoise burrows and the burrows of others species for over-wintering. The snake frequents 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.

The species is extremely uncommon on the Eglin Range with the sighting of only 29 indigo snakes throughout the Eglin Range from 1956 to 1999, and no reported sightings since 1999. Most of these snakes were seen crossing roads or after being killed by vehicles. It is difficult to determine a precise number or even estimate of the number of these snakes due to the secretive nature of this species.

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is a state threatened species. In December 2008, all Department of Defense entities, including the Air Force, as well as state agencies and other non-governmental organizations signed a Candidate Conservation Agreement with the USFWS. This agreement defines what each agency will voluntarily do to conserve the gopher tortoise and its habitat. The Federal Register Vol. 76, No. 144 / Wednesday, July 27, 2011, recently documented the 12-month finding on a petition to list the gopher tortoise as threatened in the eastern portion of its range. The review found that the listing of the gopher tortoise is warranted; however, listing is precluded by higher priority actions. The Federal Register notice also states that it will be

added to the federal candidate list and a proposed rule to list the gopher tortoise will be developed as priorities allow.

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 climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September. Gopher tortoise burrows serve as important habitat for many species, including the federally listed eastern indigo snake.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake has physically adapted to digging in the loose sand and also enters rodent burrows and occasionally gopher tortoise burrows. It is currently listed as a species of special concern by the State of Florida. Adults of this species are generally between 4 and 7 feet long, with an indistinct pattern of light brown blotches with a rusty background. The Florida pine snake prefers sandhills, sand pine scrub, and pastures with dry, sandy soils and open canopies. They are found throughout most of the state, however are absent from the Keys. Pine snake habitat is best managed by maintaining gopher tortoise populations and by keeping soil and ground disturbance to a minimum.

American Alligator (*Alligator mississippiensis*)

The American alligator is a large, semi-aquatic armored reptile ranging from 6 to 14 feet in length (USFWS, 2012). The body color is nearly black. The species has prominent eyes and nostrils and a large head with visible upper teeth. Alligators occur in a variety of habitats including lakes, rivers, wetlands, and brackish habitats (FWC, 2012a). While the American alligator population is stable, the species is listed due to similarity of appearance to the American crocodile, a federally threatened species.

Alligator Snapping Turtle (*Macrochelys temminckii*)

In Florida, the alligator snapping turtle occurs in rivers and associated habitats such as floodplain swamp forests, and occasionally in lakes (FWC, 2011b). These turtles also inhabit small streams such as seepage streams on Eglin Air Force Base. This species is the largest North American freshwater turtle, with males reaching 250 pounds and up to 29 inches carapace length. Nests are constructed in sandy soils near water.

Birds

Red-Cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker (RCW), federally and state-listed as endangered, primarily inhabits the interstitial areas of the Eglin Reservation, although RCW cavity trees can be found on some test areas as well. 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, the Eglin Range has one of the largest remaining populations of RCWs in the country. The RCW

does not migrate and maintains year-round territories near nesting and roosting trees. An RCW cluster typically encompasses about 10 acres with most cavity trees within a 1,500-foot diameter circle. Currently, 110,834 acres of the interstitial area on Eglin AFB is designated as RCW foraging habitat.

The entire RCW population size has been estimated once per year since 1994. In 2009, the RCW population on Eglin AFB reached the designated recovery goal of 350 Potential Breeding Groups (PBGs) and reconsultation was completed for future management of the species. By 2011, the population size had reached 443 active clusters and 401 PBGs. In addition to the goal of 350 PBGs, Eglin Natural Resources Section personnel have developed a long-term goal of 450 PBGs in order to allow for more mission flexibility. Figure C-1 shows the Eglin RCW population trends and goals.

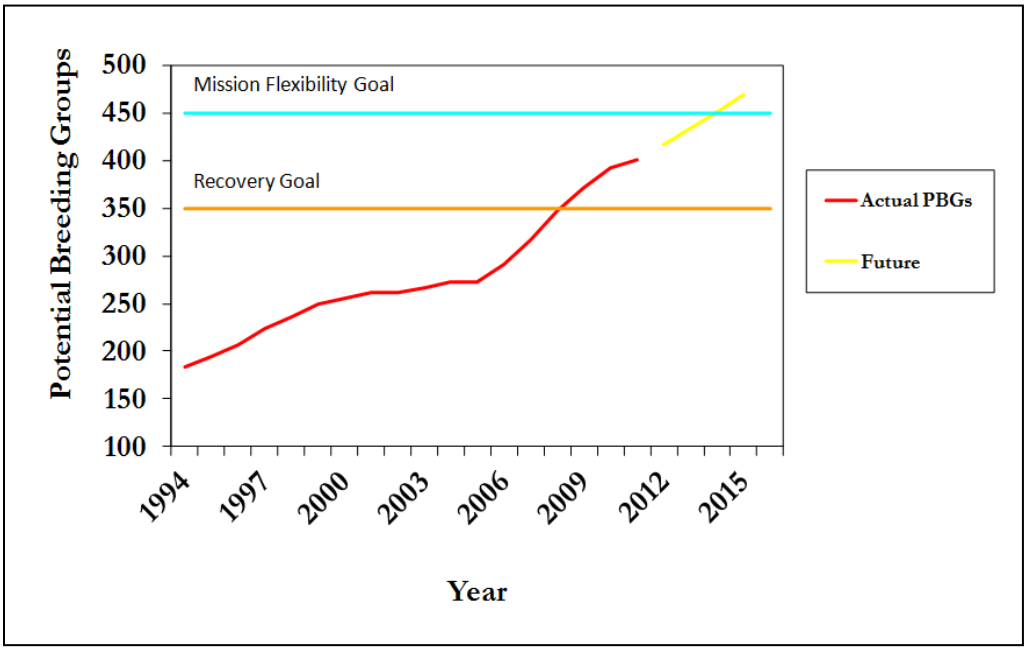

Figure C-1. Eglin RCW Population Trends and Goals

Eglin AFB maintains GIS location information for active RCW cavities, which are defined as any tree containing one or more cavities that are utilized by the RCW, and RCW foraging habitat around active clusters of RCW cavities. The Eglin AFB RCW population is divided into the eastern subpopulation, which comprises all clusters east of Highway 85, and the western subpopulation, which is comprised of all clusters west of Highway 85. The two populations are demographically separate and each subpopulation is in a different state of health. The western subpopulation is large and increasing (327 PBGs in 2011). The eastern subpopulation is smaller and stable but not increasing (74 PBGs in 2011).

These birds primarily feed on spiders, ants, cockroaches, centipedes, and insect eggs and larvae that are excavated from trees. Dead, dying, and lightning-damaged trees that are infested with insects are a preferred feeding source. High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height (dbh) averaging 10 inches and larger. While 100 acres of mature pine is sufficient for some groups, birds commonly forage over several hundred acres where habitat conditions are not ideal. RCW groups on Eglin AFB utilize large areas for

foraging habitat; thus, Eglin AFB generally manages for 300 acres per cluster with the allowance of 30 percent overlap with surrounding clusters.

General population recommendations for good quality foraging habitat include 18 or more stems per acre that are greater than 60 years in age and greater than 14 in dbh. Site conditions at Eglin AFB are generally poor; the result is that longleaf pine tends to have smaller dbhs and lower densities than much of the rest of the RCW's range. Good quality foraging habitat on Eglin AFB is defined as habitat that contains between 19 and 33 stems per acre of pines that are greater than 10 in dbh. Another requirement for good quality habitat is that it contains forbs and bunchgrasses in the understory, and has sparse or no hardwood midstory.

The greatest threat to the RCW population is habitat loss and fragmentation. If timber is to be removed within 0.5 mile of active cavity trees, then a forage habitat analysis must be completed to determine potential impacts. Consultation is required if resulting resources fall below USFWS guidelines.

Southeastern American Kestrel (*Falco sparverius paulus*)

The Southeastern American kestrel is state-listed as threatened. The kestrel is a small falcon with pointed wings, a reddish back and tail, and two black stripes on each side of the white sides of its head. Kestrels are relatively common on Eglin AFB. The clutch size is three to seven (usually four to five). Incubation is conducted mainly by females, and usually lasts 29 to 31 days. Young are cared for by both parents and usually leave the nest in about 29 to 31 days. Kestrels will readily renest if the first clutch is lost.

Kestrels prefer open or partly open sandhills habitat. On Eglin AFB, kestrels frequently utilize the cleared test areas as foraging areas and nest in cavities most often in longleaf pine trees. Cavity trees may be dead or alive. Kestrels frequently nest in old growth longleaf pines that contain cavities originally excavated by RCW. These cavities are usually enlarged by fox squirrels, pileated woodpeckers, or fire, making them large enough for kestrel use. Kestrels will readily use nest-boxes; however, Eglin AFB appears to contain an abundance of suitable nesting habitat. Kestrels feed on insects (e.g., grasshoppers and crickets) and small vertebrates (e.g., snakes, lizards, birds, mice, and sometimes bats). They often utilize the tree line or utility poles adjacent to and within cleared test areas.

Florida Burrowing Owl (*Athene cunucularia*)

The Florida burrowing owl is classified as a species of special concern by the State of Florida. The burrowing owl is small (averaging of 9 inches in height) and is characterized by bright yellow eyes, white chin accent, and lack of ear tufts. This species inhabits open, treeless areas with short groundcover (FWC, 2012b). Burrowing owls spend most of the time on the ground and use burrows year-round. They typically excavate their own burrows but may also use the burrows of gopher tortoises and armadillos. These small owls have been seen on many test areas across the Eglin Range.

Mammals

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear was proposed for federal listing in 1990, however in 1998 the USFWS removed it from listing consideration. The Florida black bear is currently listed as a state-threatened species except in Baker and Columbia Counties and Apalachicola National Forest. Black bear populations are currently found in Florida, Georgia, and a small population in Alabama. Eglin AFB is considered to be the smallest population, with an estimated 60 to 100 individuals; however, Eglin AFB's black bear population has shown signs of increase since the early 1990s. Eglin AFB's Natural Resources Section frequently receives reports of bear sightings and has responded to a growing number of bear–vehicle collisions and nuisance bear complaints. Most black bears on Eglin AFB utilize the large swamps and floodplain forests in the southwest and northern portions of the Reservation. Black bear sightings have occurred in numerous locations throughout the Eglin Reservation, the majority of which have been within the interstitial areas.

Black bears eat a wide variety of food items. Their seasonal and annual diet consists of primarily fruits, acorns, beetles, and yellow jackets. Black bear in Florida breed in June–July. Implantation is delayed about four months. Gestation lasts 7 to 7.5 months (average 220 days). Females give birth every two years at most. Young are born in January-February, and stay with their mother until fall of the second year. Litter size is typically two to four cubs and females generally give birth at three to four years old.

Plants

Hairy Wild Indigo (*Baptisia calycosa var villosa*)

Hairy wild indigo is typically found in dry sandy soil, including sandhills. Habitat may also include pine flatwoods. Hairy wild indigo is a threatened species in Florida.

Pineland Hoary-pea (*Tephrosia mohri)*

Pineland hoary-pea typically occurs in the driest portions of longleaf pine and turkey oak sandhills. This species is listed as threatened in Florida.

Baltzell's Sedge (*Carex baltzelli*)

Baltzell's sedge typically occurs in moist, well-drained, shady, steep ravines of beech-magnolia/longleaf pine-turkey oak forests. The species is listed as threatened in Florida.

Curtiss' Sandgrass (*Calamovilfa curtissi*)

Curtiss' sandgrass exhibits great vigor in response to frequent fires that control shrub encroachment within the Flatwoods ecological association. The species is specifically found in wet prairies, wet flatwoods, and the edges of dome swamps. Curtiss' sandgrass is a threatened species in Florida.

Arkansas Oak (*Quercus arkansana*)

Arkansas oak is often found in sandy or sandy clay uplands, or in upper ravine slopes near stream heads in deciduous woods. Arkansas oak is a threatened species in Florida.

Ashe's Magnolia (*Magnolia ashei*)

Ashe's magnolia typically occurs in the hardwood or mixed pine-hardwood forests of ravine slopes, bluffs, and narrow creek floodplains. It is occasionally also found on level uplands. This species prefers the upper regions of steep spring-head ravines. Soils in preferred areas tend to be moist sandy loams. Ashe's magnolia is an endangered species in Florida.

Silky Camellia (*Stewartia malacodendron*)

Silky camellia prefers well-drained soils. The species is listed as endangered in Florida.

Southern Threeawn Grass (*Aristida simpliciflora*)

Southern threeawn grass, listed as endangered in the State of Florida, occurs in Sandhill environments, wet to mesic flatwoods, longleaf pine-wiregrass savannahs, and seepage slopes (NatureServe, 2011).

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APPENDIX D

NOISE TECHNICAL INFORMATION

NOISE TECHNICAL INFORMATION

This appendix provides information on noise metrics and thresholds used to conduct the noise impact analysis of missions for all alternatives presented in the main body of this environmental assessment.

BACKGROUND AND NOISE METRICS

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with military training and the conduct of military training exercises. Concerns regarding noise relate to certain potential impacts such as hearing loss, nonauditory health effects, annoyance, speech interference, sleep interference, and effects on domestic animals, wildlife, structures, terrain, and historic and archaeological sites.

This environmental assessment considers noise associated with the use of live ordnance at TAs A-73, A-77, A-78, A-79, B-7 and B-75. Exercises using these training areas include aircraft operations, ground operations, and the use of various types of high explosives (HE).

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmarks for assessing environmental noise impacts are a day-night average sound level of 65 dBA for A-weighted noise (65 L_{dn}), and 62 dBC for C-weighted noise (62 L_{Cdn}). Noise resulting from most transportation and other daily human-related activity is measured on the A-weighted scale. Impulsive noise, such as that resulting from gunfire or explosions is measured on the C-weighted scale. These noise level thresholds are often used to determine residential land use compatibility and risk of human annoyance. In general, when exposed to noise below the levels identified above, land uses are unrestricted. As noise levels increase above these levels, some land uses become incompatible. Several other noise levels are also useful in assessing environmental impacts.

- A day-night average noise level of 55 dBA was identified by the U.S. Environmental Protection Agency as a level "... requisite to protect the public health and welfare with an adequate margin of safety" (USEPA, 1974). Noise may be heard, but there is no risk to public health or welfare.
- A day-night average noise level of 75 dBA is a threshold above which effects other than annoyance may occur. It is 10 to 15 dBA below levels at which hearing damage is a known risk (OSHA, 1983). However, it is also a level above which some adverse health effects cannot be categorically discounted.
- A sound pressure level (SPL) of 140 dBP has been identified by the U.S. Department of Labor, Occupational Safety and Health Administration as a maximum recommended unprotected exposure level necessary to prevent physiological damage to the human ear drum (29 Code of Federal Regulations [CFR] Ch. XVII § 1926.52[e]).
- A SPL less than 115 dBP has been shown to cause minimal public annoyance resulting from the noise (U.S. Army, 2001).

Public annoyance is often the most common impact associated with exposure to elevated noise levels. When subjected to day-night average sound levels of 65 dBA or 62 dBC, approximately 12 to 15 percent of persons so exposed will be "highly annoyed" by the noise. At levels below 55 dBA or 52 dBC, the percentage of annoyance is correspondingly lower (approximately 3 percent or less). The percentage of people annoyed by noise never drops to zero, but at lower levels it is reduced enough to be essentially negligible (Finegold et al., 1994; CHABA, 1981).

Time-Averaged Cumulative Day-Night Average Noise Metrics

The equivalent sound level (L_{eq}) is a metric reflecting average continuous sound. The metric considers variations in sound magnitude over periods of time, sums them, and reflects, in a single value, the acoustic energy present during the time period considered. Common time periods for averaging are 1-, 8-, and 24-hour periods.

The day-night average sound level (L_{dn}) also sums the individual noise events and averages the resulting level over a specified length of time. Normally, this is a 24-hour period. Thus, like L_{eq}, it is a composite metric representing the maximum noise levels, the duration of the events, and the number of events that occur. However, this metric also considers the time of day during which noise events occur. This metric adds 10 decibels (dB) to those events that occur between 2200 and 0700 hours (10:00 P.M. and 7:00 A.M.) to account for the increased intrusiveness of noise events that occur at night when ambient noise levels are normally lower than during the daytime. It should be noted that if no noise events occur between 10:00 P.M. and 7:00 A.M., the value calculated for L_{dn} would be identical to that calculated for a 24-hour equivalent noise level ($L_{eq(24)}$). This cumulative metric does not represent the variations in the sound level heard. Nevertheless, it does provide an excellent measure for comparing environmental noise exposures when there are multiple noise events to be considered.

SUPPORTING ANALYSIS

Noise from air-to-ground gunnery operations potentially may affect people living off of the reservation or sensitive species that occur on the reservation. Several types of noise are produced from air-to-ground gunnery operations: aircraft noise, ground-based mission noise, and airborne gunnery noise. Aircraft noise is described as a continuous noise, whereas gunnery noise and detonations may be single or repetitive impulse noise events. Different criteria and thresholds are applied to each. Sources of ground-based mission noise include live small arms fire, the detonation of explosive munitions or charges, and the impact of gunnery rounds at ground targets.

Noise analysis in Section 3.7 was derived from the more detailed discussion presented in the following sections.

No Action Alternative

Average Noise from Munitions

Noise impacts are normally assessed as those occurring during a "typical exercise-day" averaged from a year's events. This results in a conservative assessment but also minimizes either

overstating or understating noise impacts. In the case of the use of the four test areas, ordnance expenditures occur during both air and ground operations. At TAs A-77 and A-78, the number of air (gunnery) operations significantly exceeded the number of ground operations. At A-79, only ground operations occurred (with one exception), and at B-7, only air (gunnery) operations occurred.

In order to standardize the assessments and make them congruent, several assumptions were made. For each of the four areas, these assumptions were:

- The numbers of air and/or ground operations over a four-year period were averaged to determine an "average year's operations" activity.
- Specific types of ordnance expenditures were allocated to air or ground operations, whichever seemed most applicable. For example, noise levels associated with the detonation of the warheads of 105-mm howitzer rounds were allocated to air operations, since it was assumed the rounds were delivered by an AC-130 gunship, while noise levels associated with small arms fire were allocated to ground operations.
- Annual averages of ordnance expenditures, by type, were uniformly allocated to annual averages of applicable operations. This provided an average expenditure level per year per operation type, as well as an average expenditure per exercise during each of the four years.
- Noise levels associated with the firing of ordnance from an airborne platform were not considered. There were two reasons for this assumption. First, no reliable model for assessing such noise is known to exist. Noise (the sound pressure waves) resulting from the firing of ordnance from a tube, or gun (muzzle blast), is directionally focused. When an airborne platform is considered, the infinitely-variable gun barrel displacement angle (which imparts directionality to the sound waves), the aircraft-related speed and air turbulence, and the winds between the aircraft and the ground all influence propagation of the resultant sound waves. Combined, these factors make such modeling infinitely complex. Second, however, it must be noted that the muzzle blast occurs at a relatively significant distance from the ground. Although the gun's muzzle blast may be heard by a receptor on the ground, in calculating noise levels, louder sounds dominate the acoustic environment. The attenuated noise from the muzzle blasts that ultimately reaches the ground would be expected to have relatively little or no effect on the calculated noise levels of the overall exercise.
- If an exercise occurs between the hours of 10:00 PM and 7:00 AM, a 10-dB penalty is added to each event's individual noise level to account for the added intrusiveness of the noise during the night when normal ambient noise levels are lower than during the day. Based on available data, it was assumed that approximately 5 percent of the events in TAs A-77, A-78, and B-7 occurred at night. No night exercises were reported for A-79.

For the assessment of each of the areas, based on the assumptions above, average noise levels of events were allocated and assessed for a 24-hour period. This provides an average assessment of the noise exposure that would result on the day the exercise was conducted. Results are shown in C-weighted day-night average noise levels (L_{Cdn}). While it is recognized that each exercise is temporary and transient, this method of assessment does reflect the public's noise exposure (if applicable) to exercise noise on the specific day of the exercise.

The first step in the analysis was to calculate the total acoustic energy that would be generated in the exercise area. Next, the detonations of all of the exercise's components were spatially distributed throughout the area considering "most likely" areas of detonation or impact. This yielded a spatially weighted contribution to total area acoustic energy at different points. With this spatial distribution scaled on axes bisecting the area, it was then possible to calculate a mean and standard deviation for the distribution of overall acoustic energy along each axis.

These data were then used to calculate a standard normal distribution and "allocate" acoustic energy to points along each axis. Finally, the normally distributed acoustic energy from multiple source points throughout the site was aggregated at specific points at given distances from the site edges. For these analyses, the exercise "area" evaluated was considered a square, so distances from all site edges are identical. The aggregated noise levels at the receptor points represent the distributed noise that had emanated off the exercise area.

Table D-1 Missions reflects aggregated noise levels at a range of distances from TA A-77 under the No Action Alternative. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}.

Table D-1. No Action Alternative Average Ground-Based Noise from Test Area A-77 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	**Yearly**
1	71.6	71.1
2	66.7	66.2
3	63.5	63.0
3.5	Not calculated	**61.8**
3.7	62.0	Not calculated
4	**61.3**	**60.7**

Table D-2 reflects aggregated noise levels at a range of distances from TA A-78. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}.

Table D-2. No Action Alternative Average Ground-Based Noise from Test Area A-78 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	**Yearly**
1	71.4	70.4
2	66.5	65.5
3	63.4	62.4
3.1	Not calculated	62.0
3.6	62.0	Not calculated
4	**61.2**	**60.1**

Table D-3 reflects aggregated noise levels at a range of distances from TA A-79. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}. The No Action Alternative average for A-79 yearly noise is relatively low while average daily noise is comparatively high due to the amount of net explosive used on mission days.

Table D-3. No Action Alternative Average Ground-Based Noise from Test Area A-79 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	Yearly
1	74.4	58.7
2	69.8	Not calculated
3	66.9	Not calculated
4	64.7	Not calculated
5	62.9	Not calculated
5.6	**61.9**	Not calculated
6	**61.5**	Not calculated

Table D-4 reflects aggregated noise levels at a range of distances from TA B-7. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}.

Table D-4. No Action Alternative Average Ground-Based Noise from Test Area B-7 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	Yearly
1	71.8	69.6
2	66.1	63.9
2.5	Not calculated	62.1
3	62.7	**60.5**
3.3	**61.8**	Not calculated
4	**60.3**	**58.1**

Impulse Noise from Detonations

For the No Action Alternative the majority of detonations that occurred on the subject test areas were from gunnery training at A-77, A-78, and B-7, and demolition training at A-79. Maximum gunnery round net explosive weight (NEW) is 7.1 pounds for the 105 mm. Demolition training involved detonations of up to 40 pounds of C4 HE.

The Noise Assessment and Prediction System (NAPS) model was employed to analyze the noise produced from a Mk-82 (Dayton Research Institute, 1996). As weather can greatly affect the direction and distance noise can travel, the NAPS model can be operated to consider a variety of meteorological conditions at the time of detonation. The model was applied using the favorable (no or low winds, no temperature inversions) and unfavorable (strong winds from the north, cool temperatures, temperature inversions present) set of meteorological conditions. These two sets of conditions represent the typical extremes with regard to weather influence on noise propagation that may be encountered in the study area. The model output consists of a table of sound pressure dB or dBP and the range in meters to which they extend, and a visual depiction of concentric circles of increasing sound levels. Overlaid onto a map and centered at the point of detonation, the model output can show how noise emanates from the detonation point and travels across the Eglin Air Force Base (AFB) reservation.

Based on the model results run under the favorable weather scenario a minimum of about 800 acres of urban and built-up area would be exposed to 115 dBP as a result of Mk-82 detonations on TA A-79 (Table D-5). Based on the noise threshold exceeded this level would likely generate some noise complaints, annoying an estimated 15 percent of the

population. Certain weather conditions potentially would increase the degree of noise leaving the reservation and thus the number of noise of complaints.

Under a worst-case scenario of strong winds from the north and several temperature inversions, NAPS modeling indicates that for Mk-82 detonations on TA A-79, noise of up to 130 dBP could leave the reservation. Window vibration and the onset of window breakage occurs around 127 dBP. The Eglin Safety Office observes a general restriction of a maximum of <140-dBP noise level leaving the Eglin Reservation boundary, and this requirement was met for all detonations during the baseline period.

Table D-5. Noise Impact Zones of Mk-82 Charge Under Favorable Weather Conditions

	115 dBP	140 dBP
Impact (feet)	19,890	1,495
Impact area (acres)	28,530	161
Urban and built-up areas exposed (acres)	800	0
Churches and hospitals exposed	0	0

Advance notification of such tests would likely reduce annoyance. Day-of or real-time modeling is suggested for high net explosive detonations in order to predict public noise exposure and, if necessary, postpone tests with a high likelihood of generating widespread adverse public reaction.

The maximum noise impact on A-79 is expected to be associated with detonation of shaped charges containing 40 pounds NEW of C4 HE, because this ordnance type has the highest NEW of any ordnance detonated with any frequency in recent history. During this period, the 40-pound shaped charge was detonated 60 times.

NAPS model results indicate that, under favorable weather conditions, noise levels exceeding 115 dBP would be confined to Eglin AFB and would not affect any civilian populations. Under unfavorable weather conditions, noise levels may exceed 115 dBP up to 30 km in the northeastern and southeastern quadrants radiating from TA A-79 and up to 15 km towards the west (depending on wind directions; maximum impacts were to the northeast under one of the two unfavorable conditions evaluated but to the west-northwest under the alternative unfavorable condition simulated). Consequently, the footprint of areas exceeding 115 dBP could include Fort Walton Beach and Eglin Village to the east, Navarre to the south, Holley and East Bay to the west, and Holt and Galliver to the east-northeast.

Alternative 1

All information pertinent to the analysis of the small arms range and C4 detonations discussed for Alternative 1 is presented in Chapter 3. Alternative 1 would not have significant noise impacts to the community.

Alternative 2

Average Noise from Munitions

Potential noise impacts under Alternative 2 would not be significant. Alternative 2 proposes a 100 percent increase in activity over levels described in the No Action Alternative and Alternative 1. Average ground-based noise would increase under this alternative and the average annual noise could result in incompatible land use areas in the community. As the surge component of this Alternative is for the purposes of allowing temporary increases in missions during times of war or other similar situations, the incompatible land use would not be permanent. Table D-6 reflects aggregated noise levels at a range of distances from TA A-77. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}.

Table D-6. Alternative 2 Average Ground-Based Noise from Test Area A-77 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	Yearly
1	74.6	74.1
2	69.7	69.2
3	66.5	66.0
3.5	65.3	64.8
3.7	65.0	64.5
4	64.8	64.3
5	62.3	**61.8**
6	**61.6**	61.1

Table D-7 reflects aggregated noise levels at a range of distances from TA A-78. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}.

Table D-7. Alternative 2 Average Ground-Based Noise from Test Area A-78 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	Yearly
1	74.4	73.4
2	69.5	68.5
3	66.4	65.4
3.1	66.0	65.0
3.6	65.0	64.0
4	64.2	63.1
5	63.2	**62.2**
6	**61.5**	60.5

Table D-8 reflects aggregated noise levels at a range of distances from TA A-79. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}. As with Alternatives 1 and 3, average yearly noise is relatively low while average daily noise is comparatively high due to the amount of net explosive used on mission days.

Table D-8. Alternative 2 Average Ground-Based Noise from Test Area A-79 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	Yearly
1	77.4	58.7
2	72.8	Not calculated
3	69.9	Not calculated
4	67.7	Not calculated
5	65.9	Not calculated
5.6	64.9	Not calculated
6	64.5	Not calculated
8	**62.8**	Not calculated

Table D-9 reflects aggregated noise levels at a range of distances from TA B-7. Shown are the calculated noise levels for a daily exercise, and those same levels annualized. The distances and levels highlighted show where the noise level falls below 62 L_{Cdn}.

Table D-9. Alternative 2 Average Ground-Based Noise from Test Area B-7 Missions

Distance In Miles	L_{Cdn} Values	
	Daily	Yearly
1	74.8	72.6
2	69.1	66.9
2.5	67.3	65.1
3	65.7	63.5
3.3	64.8	62.6
4	63.3	**61.1**
5	**62.4**	Not calculated

Impulse Noise from Detonations

The maximum level of noise that occurred during the baseline would be the same for this alternative; thus, noise impacts would not change in intensity and an increase of noise impacts from single-event detonation noise would not occur. However, the number of detonations would increase by 100 percent, providing increased opportunity for these detonations to occur on unfavorable weather days. End user coordination with the Eglin Range Safety Office is recommended to incorporate the effects of weather on detonations for munitions such as 40-pound C4 blocks and Mk-82s.

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APPENDIX E

SOIL TYPE DESCRIPTIONS

SOIL TYPE DESCRIPTIONS

Lakeland Sand

The Lakeland Sand soil series is the primary soil type on the TAs A-73 (100 percent), A-77 (100 percent), A-78 (100 percent), A-79 (75 percent), B-7 (100 percent), and B-75 (98 percent). Key properties of Lakeland sand series include quartz sand texture, excessive drainage, high permeability rates, low organic matter and clay content, poor soil structure (low cohesion, adhesion, and aggregate stability), slopes ranging from 0 to 12 percent, and absence of active soil-forming processes. These soil characteristics suggest, at least, a moderate to high potential for soil erosion at all six test areas. Sloping topography throughout the test areas contributes to sheet soil erosion and channelization. Slopes also occur on upland areas, along waterways and wetland areas, further increasing the potential for erosion. However, in areas where the soils are mucky, erosion is less likely, since mucks are composed of organic matter and clay. Variation of sediment size with the addition of clay and organic matter helps create soil stability.

Chipley and Hurricane

The Chipley series consists of very deep, moderately well-drained or somewhat poorly drained, rapidly permeable soils that formed in thick deposits of sandy marine sediments on uplands in the Lower Coastal Plain. The soil frequently occurs in association with the Hurricane soil series. Slopes range from 0 to 8 percent. Texture is sand, or fine sand, to depths of 80 inches or more. Silt plus clay content between depths of 10 and 40 inches is 5 to 10 percent. Reaction ranges from extremely acid to moderately acid in the A horizon, except where limed, and from very strongly acid to slightly acid in the C horizon (Overing et al., 1995). Chipley soils are gently sloping, poorly drained soils that border drainages and flatwoods in upland areas. The upper 6 inches of Chipley soils typically are depicted as very dark gray sand. The underlying layers (up to approximately 80 inches) are dark, grayish-brown, overlaying yellowish-brown sand. Permeability is rapid with Chipley soils, making them well suited for crop cultivation. Corn, cotton, soybeans, and peanuts often are associated with this soil type (Overing et al., 1995).

The Hurricane series consists of very deep soils that formed in sandy marine sediments. These soils are on nearly level to gently sloping, low, broad landscapes that are slightly higher than the adjacent flatwoods of the Lower Coastal Plain. Slopes range from 0 to 5 percent. Hurricane soils are somewhat poorly drained. Runoff is slow and permeability is very rapid, or rapid in the A and E horizons, and moderately rapid in the B horizon. The water table is at depths of 2 to 3.5 feet for three to six months during most years and at depths greater than 3.5 feet the remainder of the time. Some areas are subject to flooding for brief periods. The solum is 60 inches or more thick. Depth to the spodic horizon is 51 to 79 inches. Reaction ranges from moderately acidic to extremely acidic throughout (Overing et al., 1995).

Foxworth Sand

The Foxworth series consists of very deep soils that formed in sandy marine or eolian sediments. These soils are on broad, nearly level, and gently sloping uplands and sloping to steep side slopes leading to drainage ways. Slopes range from 0 to 8 percent but most commonly are 0 to 5 percent. Runoff is very slow and permeability is rapid or very rapid. A water table fluctuates between depths of 48 to 72 inches below the soil surface for one to three months during most years and 30 to 48 inches for less than 30 cumulative days in some years. Thickness of sand exceeds 80 inches. Reaction ranges from very strongly acidic to slightly acidic throughout. Texture is sand, or fine sand, throughout and silt plus clay content in the control section is 5 to 10 percent (Overing et al., 1995).

Rutledge Loamy Sand

Rutledge fine sands are black to gray in color, with typical surface layers of black sand approximately 7 inches thick. Gray soils lie beneath this layer. Naturally occurring vegetation for Rutledge soils are bald cypress, black gum, red maple, and water tupelo. The Rutledge series consists of very deep, very poorly drained soils with rapid permeability. Rutledge soils are formed in sandy unconsolidated Coastal Plain sediments of marine origin. These soils occur on upland flats, floodplains, or depressions with planar or convex surfaces. They are also located in depressions such as bays, basins, or sinks. In depressional areas, the water table is near the surface for long periods of the year and ponding is common. Runoff is ponded or very slow and permeability is rapid throughout. Silt plus clay in the 10- to 40-inch control section averages 5 to 15 percent. The soil is extremely acidic to strongly acidic throughout, unless it has been limed. Slopes range from 0 to 2 percent (Overing et al., 1995).

Troupe Sand

Troupe sand comprises 6 percent of soils on TA A-79 and a fraction (less than 1 percent) of the soil on TA A-78. This soil type is deep, somewhat excessively drained, and moderately permeable with thick sandy surface and subsurface layers and loamy subsoils that formed in consolidated sandy and loamy marine sediments. Slopes typically are convex, less than 3 percent, but can change to greater than 20 percent.

Pactolus Loamy Sand

Pactolus Loamy Sand ranges from somewhat poorly drained to moderately well-drained soils that are nearly level to gently sloping. The surface layer is typically loamy sand that ends at a depth of approximately 20 inches. The subsoil is a sandy loam and ranges in depth from 45 inches to 80 inches.

Bonifay Loamy Sand

Bonifay Loamy Sand occurs in uplands as a strongly sloping, well-drained soil. The typical surface layer is very dark grayish-brown and is roughly 7 inches thick. Loamy subsoil occurs at a depth of 40 inches or more and tends to be yellowish in color. Surface runoff is rapid, but these soils generally hold a seasonal high water table from December to April. Bonifay soils typically are not well suited toward crop cultivation. Longleaf pine and turkey oak are naturally occurring types of vegetation on the soil (Overing et al., 1995).

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APPENDIX F

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

Introduction

This document provides the State of Florida with the U.S. Air Force's Consistency Determination under CZMA Section 307 and 15 C.F.R. Part 930 sub-part C. The information in this Consistency Determination is provided pursuant to 15 C.F.R. Section 930.39 and Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, as amended, and its implementing regulations at 15 C.F.R. Part 930.

This federal consistency determination addresses the Preferred Alternative of the *Air and Ground Gunnery: Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* (REA) at Eglin Air Force Base (AFB), Florida (Figure F-1).

Proposed Federal agency action:

The Proposed Action identified in the Air and Ground Gunnery REA is for the Air Force to establish an authorized level of activity for TAs A-73, A-77, A-78, A-79, B-7, and B-75, based on an anticipated maximum usage (Figure F-2). The ranges are already cleared for live and simulated fire, missile impact, aerial bombardment, and aerial strafing, though all activities are not authorized at all ranges (Table F-1). The Proposed Action provides for an additional surge capability in the test and/or training mission (including an overall increase in munitions use), addition of weapons systems (e.g., F-35, CV-22, remotely piloted vehicles, new armored vehicles), and additional live small arms test and training at TA A-73. During wartime, and at other times, a surge in mission activity may be necessary in order to maintain operational readiness.

Table F-1. Summary of Currently Approved Capabilities and Uses at Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Area	Capabilities and Uses	General Description	Authorized Munitions
A-73	Primarily used for mobile electronic systems for ground and flight tests such as a centralized bore sight tower facility and electronic systems test facility. Ground forces use the extreme western portion of A-73 for tactical training at a small arms firing range.	A-73 is a cleared area of about 1,290 acres and is located approximately 12 miles west of Eglin Main. This area is used for basing mobile air defense systems at test sites A-30 and A-31 located on the eastern side of A-73. Test sites A-30 and A-31 are improved fenced compounds with permanent concrete pads for locating multiple radar systems, gravel parking areas, several instrumentation and workbench trailers, four 120-foot test towers, and several bore sight and calibration towers.	Military-issue rifles, sniper rifles, submachine guns and pistols, all calibers and jacketed "ball" or "frangible ball" type ammunition up to 7.62 mm. Pyrotechnics, simulators, simunitions, and blank ammunition.
A-77	A-77 is used for tactical air-to-ground training in gunnery, bombing, and rocketry delivery. Dud-producing munitions can be employed in the designated ¾-mile-square dedicated	A-77 is an unscored, tactical air-to-ground target area located approximately 20 miles west of Eglin Main. This target area is ¾-mile square and contains various tactical targets such as vehicle convoys, bivouac areas, and gun emplacement. A Close Quarter Battle Site, Urban Close Air	Ground personnel: .38-cal, .45-cal, 7.62-mm, 9-mm, 5.56-mm, .50-cal, 40-mm TP grenades, smoke pots, signal and illumination flares, pyrotechnics, up to 5 pounds of TNT or C4, TOW-2, 66-mm LAW, and 84-mm AT-4s.

Table F-1. Summary of Currently Approved Capabilities and Uses at Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Area	Capabilities and Uses	General Description	Authorized Munitions
	impact area. Ground forces use this site as a tactical maneuver and live fire range. AFSOC has constructed an Urban Close Air Support Training Facility on the north side of A-77, and organizations wanting to schedule this facility must get approval from AFSOC prior to execution.	Support Training Facility, and improved HLZ (two spot) is located in the northwest corner of this test area.	Aerial: 7.62-mm, .50-cal, 20-mm, 25-mm, 30-mm, 40-mm, 40-mm TP grenades, 105-mm, 2.75-and 5.00-inch unguided rockets (TP/HE/WP), TOW-2, illumination flares and markers. Inert general purpose bombs: MK-82, MK-83, MK-84, MK76, MK-106, MK-117, BDU-33, BDU-45, BDU-48, BDU-50, BDU-56.
A-78	A-78 is used for tactical air-to-ground training in gunnery, bombing, and rocketry. Ground forces use this area as a tactical maneuver and live fire range. Dud producing munitions can be employed in the designated target area.	A-78 is an unscored tactical air-to-ground target area located approximately 6 miles northwest of Hurlburt Field. This target area is an approximately ¾-mile-square dudded impact area and contains various tactical targets such as vehicle convoys, bivouac area, missile site, and gun emplacement. Ground forces use this site as a tactical maneuver and live fire range.	Ground personnel: .38-cal, .45-cal, 7.62-mm, 9-mm, 5.56-mm, .50-cal, 40-mm TP grenades, smoke pots, signal and illumination flares, pyrotechnics, M18A1 Claymore anti-personnel mines, quarter stick of TNT or C-4, and M72A1 LAW. Aerial: 7.62-mm, .50-cal, 20-mm, 25-mm, 30-mm, 40-mm, 40-mm TP grenades, and 105-mm. DU is not authorized on this range. Also approved are 2.75-and 5.00-inch TP/HE/WP rockets and illumination flares and markers. Inert general purpose bombs consist of: MK-82, MK-83, MK-84, MK-76, MK-106, MK-117, BDU-33, BDU-45, BDU-48, BDU-50, and BDU-56.
A-79	A-79 has been used for a tactical air-to-ground test and training area with capability for air-to-water when the pond is filled.	A-79 is an unmanned, unscored tactical air-to-water target area located approximately 7 miles northwest of Hurlburt Field. In the past it included a water target area when the pond was filled.	9 mm, 5.56 mm, 7.62 mm, and .50 cal. The size of munitions that can be expended on A-79 is set by Range Safety on a case-by-case basis.
B-7	B-7 is used for side-firing weapon systems tactical air-to-ground training. Dud-producing munitions are authorized in the designated target area.	B-7 is a sparsely wooded area approximately 1 mile long by ½ mile wide adjacent to the northwest corner of B-75. This area is located approximately 18 miles northwest of Eglin Main.	25 mm, 30 mm, 40 mm,105 mm, illumination flares and markers. The size of munitions that can be expended on B-7 is set by Range Safety on a case-by-case basis.
B-75	B-75 is a multipurpose range used for air-to-ground, ground-to-air, air-to-air, and ground-to-ground tests. Air-to-ground tests include bombing, rocketry, and missiles. Targets may be of the stationary type, or remote-controlled moving vehicles may be used. Ground-to-air and air-to-air tests include missiles against remotely piloted vehicles.	B-75 is a cleared rectangular area 3½ by 1½ miles located approximately 15 miles northwest of Eglin Main. The primary entry to B-75 is from RR 213.	Ground personnel: 5.56 mm, 7.62, 9 mm, .50 cal, 40 mm grenades (inert), LAW (inert), C-4 and TNT bare charges Aerial: 7.62 mm and .50 cal Range Safety sets the size of munitions on a case-by-case basis. The maximum NEW used on B-75 to date is 12,800 pounds.

Table F-1. Summary of Currently Approved Capabilities and Uses at Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Area	Capabilities and Uses	General Description	Authorized Munitions
	Ground-to-ground tests include guns and missiles against stationary and remote controlled moving targets. Munitions can be scored post-mission by survey or Contraves cinetheodolites located on or adjacent to the test area. Three of these cinetheodolites can track items to the ground over most of the test area. A target complex including stationary, moving, and pop-up targets operated and maintained by the Alabama Army National Guard is located on the range. B-75 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. Items tested on B-75 range from small munitions to stacks of numerous 500-pound bombs.		

Several future foreseeable activities are included in the Proposed Action. The first is additional Army ground operations on existing roads. These operations will be of similar size and scope to existing vehicle convoy training missions. Army ground operations would include use of the joint light tactical vehicle (JLTV) and mine-resistant ambush-protected (MRAP) vehicle which are four wheel drive armored vehicles weighing over 25,000 pounds (up-armored and loaded gross weight is estimated at 40,000 pounds). It also includes traditional vehicles historically and currently used on these ranges (tow/recovery vehicles, lowboy vehicles, water purification system vehicles, conventional trucks, high mobility multipurpose wheeled vehicle (HMMWV), suburban utility vehicles [SUVs] and all-terrain vehicles [ATVs]).

The Air Force Special Operations Command (AFSOC) anticipates phasing out some of their HH-60 helicopter based operations in favor of a CV-22 platform. This will include small arms, chaff, and flare use on TA A-77 and A-78 similar to what is approved already and conducted currently by the HH-60.

Small arms test and training capability would be added to TA A-73. In August 2010, a rubber chunk-style ballistic containment system (i.e., a bullet trap) was installed on the western portion of TA A-73, though no operations were reportedly conducted on this range. This system will be used for all live fire test/training. Further, it is anticipated that breach wall training operations may be incorporated in this area. Breach wall training would consist of approximately eight

classes annually, composed of ten military personnel, detonating a maximum of 4 pounds of plastic explosive, twice per month. Small arms live fire capability is also added at TA A-79.

A training event may last two weeks or more and include multiple training objectives, including air components as well as ground components. Aircraft-dependant operations include airdrop of personnel and equipment on approved drop zones, assault landings on approved landing zones, infiltration/exfiltration of troops via land or air to include fast rope/hoist operations, electronic countermeasure training, and urban escort, as well as other in-air operations that are beyond the scope of the 2012 REA.

Ground training will involve troop infiltration/ exfiltration; airdrops of personnel and equipment; call-for-fire; personnel recovery; terminal attack control; survival, evasion, resistance, escape; and sniper/survey reconnaissance. All of these activities are currently scheduled daily on the ranges by 1 SOW, 720 STG, 7SFG(A), and the HAVE ACE Program LNO (USSOCOM) residing at Hurlburt Field. Ground activity insertions/extraction would typically involve teams of up to 12 in approved areas. Other ground training events would consist primarily of single scheduled events for marksmanship training, combat marksmanship movement drills, dismounted movement drills, direct control close air support, close quarter battle, breaching (explosive, mechanical, and ballistic); light arms training, light demolition training, mounted maneuver training, and advanced urban combat training.

Table F-2 shows the quantity of expendables associated with the Proposed Action. These quantities are derived from all current and foreseeable future mission activities that are expected to occur, and provide capacity for a test or training surge. The quantities therefore represent the maximum level of potential activity.

Table F-2. Summary of Expendables Potentially Used at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Test Area	Ordnance	Expendable Use	Expendable Net Explosive Weight (lb)
A-73	Small Arms – live	1,000,000	
3,791.00	Explosives	192	174.72
	Total	**1,000,192**	**3,965.72**
A-77	Bomb – inert	1,120	0.14
	Flare	31,596	23.44
	Gun – inert	288,376	577.76
	Gun – live	908,544	160,175.24
	Missile – live	8	9.10
	Small Arms – inert	63,444	53.29
	Small Arms – live	7,598,268	28,805.03
	Smoke	1,780	0.94
	Miscellaneous Expendables	159,068	10.02
	Total	**9,052,204**	**189,654.98**
A-78	Bomb – inert	224	0.03
	Flare	31,596	23.44
	Gun – inert	200,244	401.19
	Gun – live	909,036	160,282.65
	Missile – live	24	27.31
	Small Arms – live	5,676,760	21,520.60
	Small Arms – inert	15,860	13.32

Table F-2. Summary of Expendables Potentially Used at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Test Area	Ordnance	Expendable Use	Expendable Net Explosive Weight (lb)
	Smokes	788	0.42
	Miscellaneous Expendables	146,424	9.23
	Total	**6,980,956**	**182,278.19**
A-79	Bomb – live	16	2,457.60
	Miscellaneous Expendables	71,068	4.48
	Small Arms - live	1,775,370	6,730.43
	Total	**1,846,454**	**9,192.51**
B-7	Flare	13,378	9.93
	Gun – inert	129,860	260.17
	Gun – live	320,542	56,511.18
	Small Arms - live	4,950	18.76
	Miscellaneous Expendables	96,652	6.09
	Total	**565,382**	3,791.00
B-75	Bombs	4,112	1,935
	Smokes	1,000	0.53
	Flares	78,601	58.32
	Explosives	519,676	472,905.16
	Missiles	1,228	1,397.46
	Rockets	1,928	1.10
	Small Arms - live	16,710,123	63,348.08
	Miscellaneous Expendables	148	0.01
	Total	**17,316,816**	**537,711**

Source: U.S. Air Force, 2012
lb = pounds; NEW = net explosive weight

Federal Consistency Review

Statutes addressed as part of the Florida Coastal Zone Management Program consistency review and considered in the analysis of the Proposed Action are discussed in the following table.

Pursuant to 15 C.F.R. § 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 C.F.R. § 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.

Table F-3. Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 *Beach and Shore Preservation*	The Proposed Action would not affect beach and shore management, specifically as it pertains to: • The Coastal Construction Permit Program. • The Coastal Construction Control Line (CCCL) Permit Program. • The Coastal Zone Protection Program. All activities would occur on federal property.	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.
Chapter 163, Part II *Growth Policy; County and Municipal Planning; Land Development Regulation*	The Proposed Action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 *State and Regional Planning*	The Proposed Action would be consistent with Florida's statutes and regulations regarding state plans for water use, land development or transportation.	Details state-level planning efforts. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 *Emergency Management*	The Proposed Action would not affect the state's vulnerability to natural disasters. The Proposed Action would not affect emergency response and evacuation procedures.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 *State Lands*	All actions will take place within Eglin property. Therefore, the Proposed Action would not negatively affect state lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 *State Parks and Preserves*	All actions would take place within Eglin property. Therefore, the Proposed Action would not negatively affect state parks, recreational areas and aquatic preserves.	Addresses administration and management of state parks and preserves.
Chapter 259 *Land Acquisition for Conservation or Recreation*	The Proposed Action would not affect tourism and/or outdoor recreation.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.
Chapter 260 *Florida Greenways and Trails Act*	The Proposed Action would not affect the Greenways and Trails Program.	Established in order to conserve, develop, and use the natural resources of Florida for healthful and recreational purposes.

Table F-3. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
Chapter 267 *Historical Resources*	There would be no adverse effects to cultural resources under the Proposed Action with implementation of the following policies and procedures: Unsurveyed areas with high probability of archaeological resource occurrence exist on and near all Test Areas except B-75; surveys would be required before activities take place in these areas. Sites potentially eligible for listing in the National Register of Historic Places occur at A-79 and B-75; these sites must be protected until further evaluation determines eligibility. Ground-disturbing activities must be avoided at Metts Cemetery outside B-75. Consultation with 96 CEG/CEVSH is required to obtain the latest information on known and unknown cultural resources before undertaking any ground-disturbing activities at any of the Test Areas. Identified resources would be managed in compliance with Federal Law and Air Force regulations. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the state's archaeological and historical resources.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 *Commercial Development and Capital Improvements*	The Proposed Action would occur on federal property and would not affect future business opportunities on state lands, or the promotion of tourism in the region.	Promotes and develops general business, trade, and tourism components of the state economy
Chapter 334 *Transportation Administration*	The Proposed Action would not affect transportation.	Addresses the state's policy concerning transportation administration.
Chapter 339 *Transportation Finance and Planning*	The Proposed Action would not affect the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system.

Table F-3. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
Chapter 373 *Water Resources*	There would be no significant impacts to water resources under the Proposed Action. Increased munition expenditures would not result in metal concentrations in groundwater exceeding USEPA risk-based concentrations. Surface water resources are located at distances from targets sufficient to minimize potential for contaminant transport, and sedimentation due to erosion would be controlled by management requirements. Wetlands would not be impacted, and no actions would modify the floodplain. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the water resources of the state.	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.
Chapter 375 *Outdoor Recreation and Conservation Lands*	The Proposed Action would not affect opportunities for recreation on state lands.	Develops comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs.
Chapter 376 *Pollutant Discharge Prevention and Removal*	Under the Proposed Action, debris and ordnance expenditures would increase substantially, and therefore the release of hazardous chemicals would increase. However, no new Toxic Release Inventory (TRI) thresholds would be exceeded and adverse impacts to the environment are not anticipated. Therefore the Proposed Action would be consistent with Florida's statutes and regulations regarding the transfer, storage, transportation of pollutants, and cleanup of pollutant discharges.	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 *Energy Resources*	The Proposed Action would not affect energy resource production, including oil and gas, and/or the transportation of oil and gas.	Addresses regulation, planning, and development of oil and gas resources of the state.

Table F-3. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
Chapter 379 *Fish and Wildlife Conservation*	Surges in test and training activities could result in an increased number of direct strikes to wildlife species, but the probability would be low and significant effects would be unlikely. Wildlife species, including the red-cockaded woodpecker (RCW), could be exposed to noise more frequently, resulting in increased incidences of behavioral reactions. However, RCWs are evidently acclimated to noise at least to some degree, and negative effects to the overall population on Eglin are not expected. Population monitoring would continue and Eglin Natural Resources Section would evaluate specific activities for possible repetitive impacts to individual RCWs. However, increased wildfire potential could adversely impact sensitive plant communities, including RCW cavity trees. Nighttime fires could also directly impact roosting RCWs. Eglin Natural Resources is currently conducting a formal consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA) in regards to protected species. All terms and conditions resulting from this consultation would be followed. Therefore the Proposed Action would be consistent with the State's policies concerning the protection of wildlife.	Addresses the management and protection of the state of Florida's wide diversity of fish and wildlife resources.
Chapter 380 *Land and Water Management*	The Proposed Action would occur on federally owned lands. Under the Proposed Action, development of state lands with regional (i.e. more than one county) impacts would not occur. No changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would occur.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 *Public Health, General Provisions*	The Proposed Action would not affect the state's policy concerning the public health system.	Establishes public policy concerning the state's public health system.
Chapter 388 *Mosquito Control*	The Proposed Action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.

Table F-3. Florida Coastal Management Program Consistency Review, Cont'd

Statute	Consistency	Scope
Chapter 403 *Environmental Control*	There would be no significant impacts to water resources under the Proposed Action. There would be no adverse impacts to air quality due to pollutant or greenhouse gas emissions at either a county or regional level. No new TRI thresholds would be exceeded and adverse impacts to the environment are not anticipated. Therefore, the Proposed Action would be consistent with the State's policies concerning water quality, air quality, pollution control, solid waste management, or other environmental control efforts.	Establishes public policy concerning environmental control in the state.
Chapter 582 *Soil and Water Conservation*	There would be no significant impacts to soils under the Proposed Action. Increased munition expenditures would not result in metal concentrations in the soil exceeding USEPA risk-based concentrations. Increased munition training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential. Therefore, the Proposed Action would be consistent with the Florida's statutes and regulations regarding soil and water conservation efforts.	Provides for the control and prevention of soil erosion.

Figure F-1. Regional Location Map

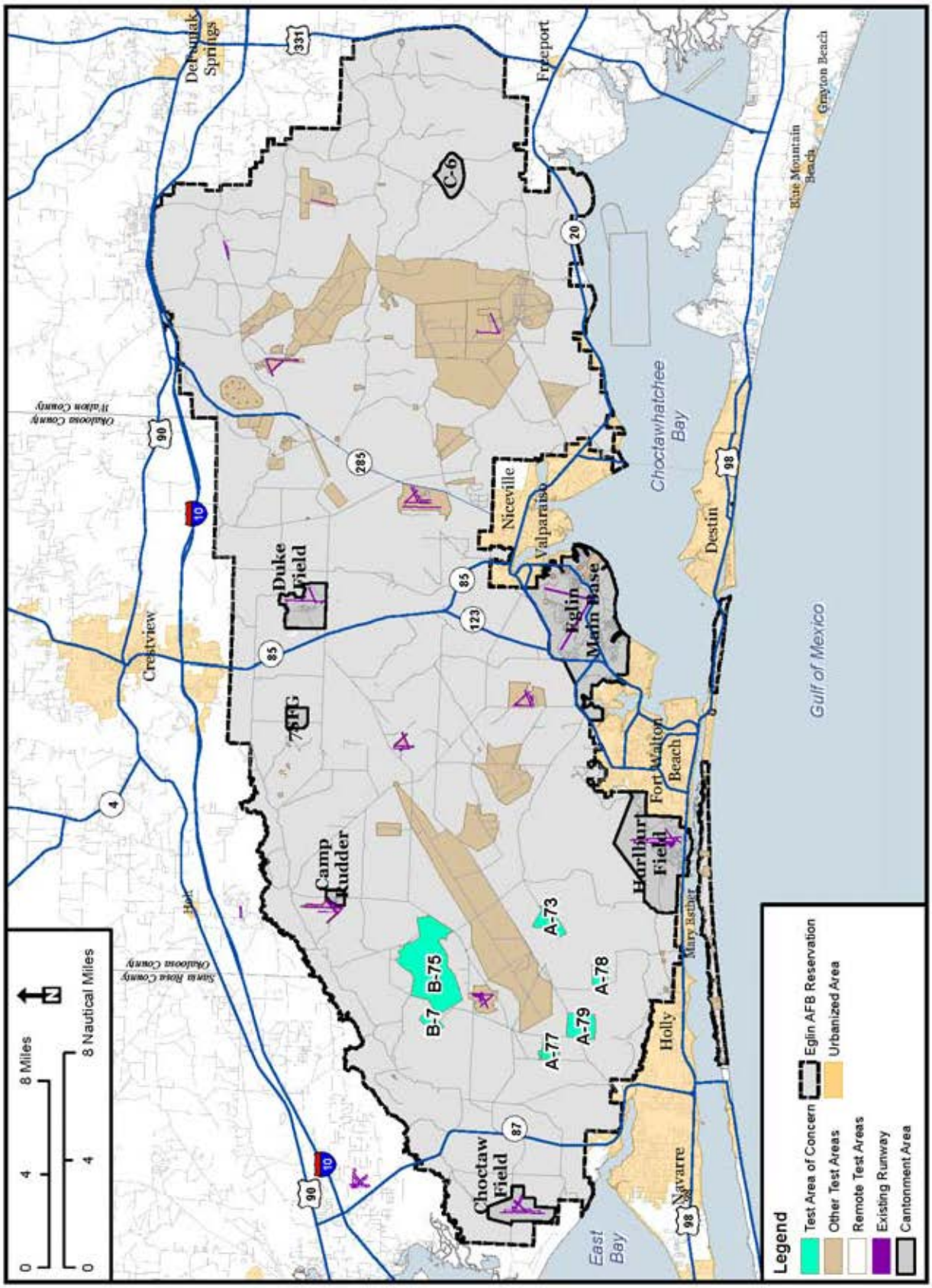

Figure F-2. Proposed Action Location

APPENDIX G

CULTURAL RESOURCES

CULTURAL RESOURCES

Brief History of Eglin Air Force Base (AFB)

This area of Florida was first occupied by Paleo-Indian populations approximately 12,000 years before present (bp) (Milanich, 1994). These early populations were geographically tethered to inland watering holes and along coastal areas with access to water. They subsisted primarily on now-extinct species of Pleistocene megafauna such as bison and mammoth. As the climate grew warmer and more arid during the hypsithermal period (10,000–5,000 bp), humans began exploiting a wider variety of plants and animals found within the local ecology. New technologies to exploit these resources were also developed during this time period, and these tools are often recovered from archaeological sites in the region (Anderson and Sassaman, 2004a).

During this time, also known as the Archaic period, mound complexes in the region, such as Poverty Point in Louisiana, developed as populations in the southeastern United States increased in ceremonial and cultural complexity. The Archaic period and subsequent time periods are also witness to incipient agriculture, mound burials, and increasingly permanent settlements (Anderson and Sassaman, 2004b). The terminus of these trends during the Woodland period (2,700–1,000 bp) led to the development of distinct prehistoric Native American cultures. These cultures are more visible and definable in the archaeological record, due to better preservation of more recent material remains and more stylistically identifiable objects such as pottery (Jeffries, 2004).

Early Spanish *entradas* (entries) by individuals such as Juan Ponce DeLeon in 1513 and 1521, and later by Hernando DeSoto (who is believed to have passed near Alabama and Tallahassee, Florida, to the north and east of Eglin Range, respectively), brought drastic changes to the region. These changes affected even populations untouched by direct colonization in terms of technology, culture, mass depopulation, and upheaval as a result of introducing foreign pathogens such as smallpox, measles, and influenza (Saunt, 2004). Estimates of native populations in the southeastern United States range from 1,000,000 to 4,000,000 individuals just prior to European arrival. By 1685, population estimates within the same region had fallen to 200,000 individuals (Saunt, 2004).

French and British populations also moved through and laid claim to portions of the region (Saunt, 2004). European involvement in Florida ended in 1819 when, by treaty, the United States received rights to the remaining Spanish claims in the region (Dowd, 2004). In 1845, Florida became the twenty-seventh state of the Union. For the next 50 years, plantation agriculture, citrus, cattle, and the naval stores industries, along with supporting infrastructure, were the primary occupations for most Floridians.

Eglin AFB was originally established as an Army bombing and gunnery base in 1935. In 1940, as World War II approached, Congress ceded the surrounding Choctawhatchee National Forest from the Forest Service to the War Department (U.S. Air Force, 2006). During World War II, Eglin would gain notability as the location where Doolittle's raid was planned, where captured

German V-1 rockets were reverse-engineered by American scientists into the JB-2 buzz bomb weapon, and where "Operation Crossbow," the reconstruction of Germany's "Vengeance" (or "V" weapon) rocket launch facilities took place, as well as testing of methods that would be used to destroy those launch sites. Because of this early foundation, Eglin Field would become an important armaments testing facility for the U.S. military after the war.

Based upon the work conducted during World War II on captured German rocket technology, the Army Air Force created the first Experimental Guided Missiles Group to develop and test missiles at Eglin Field on 26 January 1946. In December 1957, Eglin AFB would become home to the newly established Air Proving Ground Center. Under this aegis, numerous systems would be tested at Eglin Range during the 1950s and 1960s, including the Boeing/Michigan Aeronautical Research Center (BOMARC) ground-to-air missile system and Hound Dog, a standoff, air-to-ground missile. In 1968, the Air Proving Ground Center was redesignated the Armament Development and Test Center (Global Security, 2006).

Traditional Cultural Properties (TCPs)

Traditional cultural properties (TCPs) are historic sites eligible for the National Register of Historic Places (NRHP) under one or more of the criteria in 36 Code of Federal Regulations (CFR) 60.4 (Sebastian, 1995). According to the National Park Service *Guidelines for Evaluating and Documenting Traditional Cultural Properties*, a TCP is defined as, "…one that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King, 1998)." Note that TCPs also overlap the definition of *historic properties* (36 CFR § 800.16(l)(1)) where they are "…properties of traditional religious and cultural importance to an Indian Tribe …" and that meet the National Register criteria. No specific studies have been conducted to date at Eglin AFB to identify TCPs although cultural resource surveys to date are considered adequate to interpret that a low probability for TCPs exist within the project Area of Potential Effect (APE).

ATTACHMENTS

The 2003 PA is attached to this Appendix as Attachment G-1.

The cultural resource specific stipulations from Eglin AFB Instruction 13-212, *Range Planning and Operations* is attached to this Appendix as Attachment G-2.

The letter from Eglin to the SHPO recommending a no adverse effects determination and the concurrence letter from the SHPO to Eglin are attached to this Appendix as Attachment G-3.

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ATTACHMENT G-1
2003 PROGRAMMATIC AGREEMENT

PROGRAMMATIC AGREEMENT
BETWEEN
THE AIR ARMAMENT CENTER, EGLIN AIR FORCE BASE,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION AND
THE FLORIDA STATE HISTORIC PRESERVATION OFFICER

REGARDING THE PRESERVATION AND PROTECTION OF HISTORICAL AND ARCHAEOLOGICAL RESOURCES LOCATED AT EGLIN AIR FORCE BASE, FLORIDA

WHEREAS, the Air Armament Center (AAC), Eglin Air Force Base, Florida, the Florida State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) acknowledge that maintenance, construction, demolition, alteration, and repair of facilities and properties within Eglin AFB have the potential to affect historic properties included, or eligible for inclusion, in the National Register of Historic Places (NRHP);

WHEREAS, Eglin AFB's Cultural Resources Management Plan (CRMP) will establish policies, responsibilities and procedures for the protection of historic and cultural resources within Eglin AFB and reflects the intent of the Department of Defense to provide conscientious stewardship of historic and cultural resources located on properties owned or controlled by the Department of Defense;

WHEREAS, the CRMP will be designed to provide a framework within which historic and cultural resources at Eglin AFB are managed in a manner consistent with federal law and the mission of Eglin AFB and its tenants;

NOW, THEREFORE, the parties agree that undertakings which have the potential to affect historic properties within Eglin AFB shall be carried out in accordance with the CRMP and the following stipulations, in order to satisfy the requirements of Section 106 of the National Historic Preservation Act, 16 U.S.C. 470(f), and the Council's implementing regulation, 36 CFR Part 800, Protection of Historic Properties.

STIPULATIONS

1. PARTICIPANTS IN SECTION 106 PROCESS

AAC will ensure participants identified in 36 CFR Part 800.2(c) are included in the Section 106 consultation process, as appropriate.

2. STANDARDS AND GUIDELINES

AAC will ensure that all undertakings affecting historic properties will conform to *The Secretary's Standards for the Treatment of Historic Properties* (36 CFR Part 68) and applicable guidelines (Standards and Guidelines), incorporated herein by reference.

3. IMPLEMENTATION OF CRMP OBJECTIVES

AAC will implement the CRMP in consultation with the appropriate participants identified in 36 CFR Part 800.2(c).

4. IDENTIFICATION OF HISTORIC PROPERTIES AT EGLIN AFB

A. AAC will prepare a list of historic properties and a Historic Buildings Location Map of Eglin AFB within 60 days of the date of the execution of this Agreement and an Archaeological Sensitivity Map of Eglin AFB within 1 year of the date of execution of this Agreement:

(1) Historic Buildings Location Map. The Historic Buildings Location map will identify:

a. Historic structures included in, or eligible for inclusion in, the NRHP; and

b. Boundaries, or proposed boundaries of historic districts, which may be included in, or eligible for inclusion in, the NRHP.

(2) Archaeological Sensitivity Map. The Archaeological Sensitivity Map will identify:

a. Known archaeological sites included in, or eligible for inclusion in, the NRHP;

b. Areas in which currently unknown archaeological sites may be located which may be eligible for inclusion in the NRHP.

The location of all archaeological sites will remain confidential pursuant to 36 CFR 800.11(c).

B. The list and maps will be reviewed and updated annually by AAC in consultation with the SHPO. For the purpose of this Agreement, historic properties are defined in 36 CFR 800.16 (l) to be "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to 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 term eligible for inclusion in the National Register includes both properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the National Register criteria."

5. EXEMPTED ACTIONS

The Base Historic Preservation Officer (BHPO) will serve as the liaison between the SHPO, Council, AAC and all other identified consulting parties. AAC's BHPO will, in consultation with the SHPO, establish a process that will ensure the actions described below are appropriately reviewed by the BHPO prior to any undertaking. When review has been completed by the BHPO, the following actions will be exempt from further consultations:

A. Maintenance, construction, demolition and ground disturbing activities which do not affect historic properties.

B. Maintenance, repair and/or replacement of existing subsurface structures and roads, runways and existing utilities, so long as any ground disturbing activities are performed within previous construction limits as the original work and do not adversely affect archaeological sites.

C. Any emergency work of the following description:

(1) Protection of the human health and/or the environment from damage or harm by hydrocarbon or hazardous materials;

(2) Prevention of imminent damage resulting from the threat of hurricane, tornado or other natural disaster;

(3) Stabilization necessitated by the threat of imminent structural failure (e.g. repair or replacement of building footings); and actions waived from the usual procedures of Section 106 compliance, pursuant to 36 CFR Part 800.12 (d).

D. Interior maintenance or repair performed in accordance with the Standards and Guidelines, which does not adversely affect the character-defining interior features or spaces of an historic property.

E. Routine maintenance of historic properties is defined as follows:

(1) Repainting (provided that surface preparation does not damage, erode or otherwise disfigure historic building materials);

(2) Repair or replacement in kind of less than 5% of total historic materials, finishes and features;

(3) Removal or in-kind replacement of non-historic materials, finishes and features;

(4) Removal of non-original intrusive surface applied elements such as exterior wall-mounted conduits, pipes, wiring and junction boxes;

(5) Replacement or installation of caulking and weather-stripping around windows, doors, walls and roofs;

(6) Repair and replacement in kind of deteriorated or damaged trim, hardware, doors, gutters, porches, steps, roofs or parts of a roof, and window or door screens;

(7) Replacement of glass, which shall in no case alter existing window material or form, and which may allow for the placement of double or triple glazed windowpanes with clear glazing, but shall not allow for the placement of tinted glass (which will require consultation);

(8) Maintenance of historic features such as frames, paneled or decorated jambs or moldings through surface treatments such as cleaning, rust removal, paint removal, and re-application of protective coating systems, which shall not include sandblasting for cleaning surfaces or removing rust or paint;

(9) Repair of historic window and door frames by patching, splicing, consolidating, or otherwise reinforcing or replacing those parts that are either extensively deteriorated or are missing, where the same configuration of panes or door panels will be retained;

F. The installation and maintenance of new security and fire protection equipment and materials, including fire detection systems, fire suppressant systems, security systems and security devices such as dead bolts, door locks, window latches, and door peepholes. (No original security devices will be removed.)

G. Routine landscaping and lawn maintenance or repair that does not adversely affect the exterior appearance or the character defining historic features or spaces of an historic property. Routine landscaping and lawn maintenance or repair includes the following:

(1) Normal mowing, pruning, shearing, watering and feeding;

(2) Limb or whole removal of vegetation, shrubs, or trees determined to be a safety hazard;

(3) Removal and replacement in kind of vegetation; and

(4) Maintenance and replacement in kind of planters, flowerbeds, sidewalks, walkways, fences and freestanding signage.

H. For the purposes of this Agreement, notwithstanding the above, the following types of activities shall not be considered routine maintenance when involving historic materials, finishes, and features of historic properties:

(1) Masonry cleaning and repair;

(2) Replacement of deteriorated materials, finishes and features with elements that do not conform to the Standards and Guidelines;

(3) Application of nontraditional or historically inappropriate masonry coatings, including the painting of previously unpainted historic masonry, masonry consolidants and waterproof/water repellent coatings; and

(4) Replacement of deteriorated materials, finishes and features which comprise more than 5% of the total area of a historic property.

I. For maintenance and repair activities not specifically identified above, consultations with the SHPO will be completed prior to initiating the undertaking.

J. The BHPO has the discretion to determine that a proposed activity, while generally qualifying as a maintenance or repair activity specifically identified above, may nonetheless present unique circumstances which, in the BHPO's discretion, mandate consultation. These unique circumstances may include, but are not limited to, instances where the activity:

(1) Is of greater scope or size than generally anticipated by this Agreement;

(2) Poses a potential for degradation (even though slight) of an already marginal or poor historic property; or

(3) Utilizes nontraditional, unproven technology and or materials.

6. REHABILITATION, LONG-TERM MAINTENANCE AND PRESERVATION OF HISTORIC STRUCTURES

A. Historic properties shall be preserved, maintained and rehabilitated in accordance with the recommended approaches in the Standards and Guidelines. For the purposes of this Agreement, the term "rehabilitation" shall include construction activities commonly referred to as "remodeling" and "renovation."

B. All design and construction documents developed pursuant to this Agreement shall be developed in consultation with the SHPO. Unless agreed to in advance on a project-specific basis, design submission documents prepared pursuant to this Agreement shall be made by AAC and submitted to the SHPO at the completion of the conceptual schematic, advanced schematic, design development and contract document phases of structural maintenance, repair and rehabilitation projects.

C. Rehabilitation of non-historic additions to individual historic properties or to non-contributing structures within historic districts identified in Stipulation 4(A), shall be subject to the provisions of Stipulation 7(A), below.

7. CONSTRUCTION

A. AAC shall ensure that all new construction within an historic district identified in Stipulation 4(A) shall be compatible with the scale, massing, color, and materials of the nearby historic properties and shall be designed in accordance with the recommended approaches to new construction set forth in the Standards and Guidelines. Construction not included within a district that may affect an historic property will be reviewed and forwarded by the base historic preservation officer to the SHPO on a case by case basis.

B. AAC shall ensure that the design of all construction affecting historic properties shall be assessed pursuant to 36 CFR Part 800.5. Unless a project-specific agreement has been reached between the AAC and the SHPO, design submission documents prepared pursuant to this Agreement shall be submitted for review at the completion of the conceptual schematic, advanced schematic, design development and contract document phases of construction projects.

C. If an adverse effect is found, AAC will consult further to resolve the adverse effect pursuant to 36 CFR Part 800.6.

8. DEMOLITION OF HISTORIC PROPERTIES

A. AAC will ensure that AAC or any tenant or host command does not inadvertently cause the demolition of an historic property. AAC will ensure that the following measures are completed prior to approving any actions that could cause the demolition of an historic property:

(1) A consultation package shall be prepared by AAC when an undertaking is proposed that may result in the demolition of an historic property. The consultation package shall document the reason(s) that the responsible command believes preservation of the historic property is not a prudent and feasible alternative to demolition, and shall be submitted to the SHPO for review. The SHPO shall have 30 days from the date of receipt for review.

(2) The consultation package shall include, in addition to measures in stipulation A, the following information:

a. The identification of, and location maps for, all affected historic properties, including clearly delineated boundaries for any affected historic district;

b. An assessment of the effects of the undertaking with regard to historic properties;

c. An analysis of reasonable alternative courses of action considered and the reasons for their rejection; and

d. A description of strategies proposed for mitigating adverse effect(s).

B. If the SHPO determines that AAC has not supported its decision to demolish, AAC (in conjunction with a tenant or host command, if necessary) will consult with the SHPO to develop alternatives to the demolition. The resolution of the adverse effect will continue pursuant to 36 CFR 800.6.

C. If demolition or alteration of historic properties is undertaken, AAC will include, in any Memorandum of Agreement concerning those actions, the stipulation that AAC, in consultation with the SHPO, will, prior to approving the undertaking, identify and, where appropriate, salvage any character-defining historic interior or exterior features of an historic property, when such salvage is reasonable, feasible and prudent.

9. RECORDATION OF HISTORIC PROPERTIES

In accordance with AFI 32-7065 and 32-9004, AAC will consult with the SHPO and the Advisory Council on Historic Preservation prior to the demolition of historic properties to determine whether recordation is necessary, and if so, at what level.

10. TREATMENT OF ARCHAEOLOGICAL PROPERTIES

A. In consultation with the SHPO, the AAC shall develop a program of archaeological survey to locate, inventory, and evaluate archaeological sites and shall establish a procedure for the protection and preservation of sites included in, or eligible for inclusion in, the NRHP.

B. If an undertaking at Eglin AFB will adversely effect an archaeological site, AAC will resolve the adverse effect pursuant to 36 CFR Part 800.6.

C. If historic properties are discovered during implementation of an undertaking, AAC will proceed pursuant to 36 CFR 800.13.

D. AAC shall actively ensure compliance with the Archaeological Resources Protection Act of 1979 (ARPA) and will advise all contract and Air Force personnel and resident dependents against illegal collection of cultural materials and the penalties for such collection imposed by the Act. Appropriate measures will be developed by AAC for the protection of historic properties from looting and vandalism and for protection under ARPA.

11. DISPUTE RESOLUTION

A. Should any of the signatories to this Agreement object within 30 days to any plans or specifications provided for review pursuant to this Agreement, AAC will consult with the objecting party to resolve the objection. If AAC determines that the objection cannot be resolved, AAC will invite the Council to review the relevant documentation pertaining to the issue in dispute. Within 15 days after receipt of all pertinent documentation, the Council will advise the consulting parties as to whether it will comment pursuant to 36 CFR 800.6(a)(1)(iii). Council comment provided in response to such a request will be taken into account by AAC in accordance with 36 CFR Part 800.6(c)(2) with reference to the subject of the dispute. Any recommendation

or comment provided by the Council will be understood to pertain only to the subject of the dispute.

12. PROJECT REVIEW, MONITORING, AND TECHNICAL ASSISTANCE

A. The BHPO shall provide to the SHPO for review, plans, specifications and other proposals for work as required pursuant to the terms of this Agreement. The SHPO shall provide comments to AAC within 30 working days of receipt of complete and sufficient project information delivered to:

Division of Historical Resources
Compliance Review Section
State Historic Preservation Office
R.A. Gray Building, Room 423
500 South Bronough Street
Tallahassee, Florida 32399-0250
(850) 245-6333
Fax (850) 245-6437

B. Documentation sufficient to enable professional evaluation of the proposed undertaking will accompany each review request. Any question regarding the sufficiency of documentation will be resolved through consultation with the SHPO.

C. If the SHPO objects to any element of a plan, specifications, or other proposals for work at Eglin AFB, AAC, in consultation with the SHPO, will consider alternatives to the proposed undertaking. The conclusion of these considerations will be documented in writing by AAC and provided to the SHPO.

D. Should substantial changes be proposed by AAC for plans and specifications previously reviewed by the SHPO, these changes shall be submitted for review and comment pursuant to the terms of the applicable Stipulation of this Agreement.

E. The SHPO shall provide technical assistance, consultation and expert advice when requested to do so by AAC to aid AAC in complying with the terms of this Agreement.

13. PROGRAM REVIEW

A. At the end of each state fiscal year, the SHPO or AAC may request a review of the terms and conditions of the Agreement, which may be amended following consultation between the parties.

B. AAC will provide the SHPO an opportunity to inspect work sites and project files to verify adherence to the stipulations of this Agreement. At the SHPO's request, but at least once per year, AAC shall provide information about, or access to all records concerning, undertakings that affect historic properties within Eglin AFB.

C. The BHPO will submit an annual report to the SHPO and the Council within 60 days of the anniversary of the execution of this Agreement. The report will describe the nature and status of the previous year's undertakings which were covered by the terms of this Agreement and reviewed by the BHPO. The report will describe actions taken to implement the terms of the

Agreement, provide suggestions, if appropriate, for modifying or amending the Agreement, and any recommendations for implementing the Agreement over the coming year.

Execution and implementation of this Programmatic Agreement evidences that the AAC has afforded the Council a reasonable opportunity to comment and that the AAC has taken into account the effects of all undertakings carried out under the terms of this Agreement.

FLORIDA STATE HISTORIC PRESERVATION OFFICER

BY: Janet Snyder Matthews DATE: 7/17/2002

TITLE: State Historic Preservation Officer

THE UNITED STATES AIR FORCE, AIR ARMAMENT CENTER

BY: Robert W Chedister DATE: 11 Aug 02

TITLE: Commander

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: _____ DATE: 2/14/03

(for) TITLE: Executive Director

ATTACHMENT G-2
EGLIN AFB INSTRUCTION 13-212, *RANGE PLANNING AND OPERATIONS*

7.3.9.4. Any project that entails deviation from these restrictions is likely to involve further cultural resources survey, testing, and/or consultation with the State Historic Preservation Office and possibly Native American Tribal organizations.

7.3.10. Inadvertent discoveries.

7.3.10.1. Archaeological Deposits. If archaeological 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, the following actions are to be taken:

7.3.10.1.1. All disturbance of the ground surface shall cease and the discovery will be secured from further harm.

7.3.10.1.2. Eglin CR (882-8459 or 883-5201) shall be immediately informed of the discovery.

7.3.10.2. Human Remains. 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.

7.3.10.2.1. All disturbance of the ground surface in the area shall cease and the discovery will be secured from further harm until further notice.

7.3.10.2.2. Eglin CR shall be immediately informed of the discovery.

7.3.10.2.3. An Eglin CR archaeologist will investigate and consult with Eglin law enforcement in determining whether the remains are of forensic significance.

7.3.10.2.4. Activities may be cleared to proceed in between 3 and 30 days from notification, depending upon whether the remains are determined to be forensically significant, of Native American descent, or neither.

7.4. Waste Management.

7.4.1. General.

7.4.1.1. The goal of the Environmental Compliance Pollution Prevention Branch (CEVCP) is to help reduce production of waste materials and toxic pollutants through promotion of innovative new technologies, alternative raw materials, effective management practices, relevant training and efficient inventory control. Management guidance is provided for the Solid Waste, Recycling, and Hazardous Materials Management (HazMat Cell) programs. Pollution prevention philosophy is to be infused to all environmental programs to ensure efficient and cost-effective means of environmental stewardship and compliance.

Fire Management	882-6233
Fire Dispatch	882-5856
USFWS Panama City Office	850-769-0552
NMFS Southeast Regional Office, Marine Mammal Branch	(727) 824-5312
Marine Mammal Stranding Network	877-433-8299

7.3. Cultural Resources

7.3.1. Cultural Resources (CR) on Eglin consist of archaeological sites, structures, artifacts, and any other physical evidence of human activity considered relevant to a culture or community for scientific, traditional, religious, or other reasons. Resources include archaeological deposits or surface materials, historic architectural resources, American Indian sacred sites, and traditional cultural properties.

7.3.2. As a Federal Agency, Eglin AFB is required by law to consider the effects its actions may have on historic properties and the cultural environment. Guidance to the form and process of these considerations and evaluations are provided in the AFI 32-7065 (USAF 2004). The considerations are mandated by the National Environmental Policy Act (NEPA) of 1969, the National Historic Preservation Act (NHPA) of 1966, the Archaeological Resources Protection Act of 1979 (ARPA), the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), and the American Indian Religious Freedom Act (AIRFA), among other acts of Congress.

7.3.3. In addition, Eglin AFB has specific and explicit legal arrangements with several state and federal agencies concerning the treatment of cultural resources. These include Programmatic Agreements and Memoranda of Agreement with the Air Force Air Armament Center, the Army Seventh Special Forces Group, The Joint Strike Fighter Program, the United States Marine Corps, the Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer. These are referenced as the BRAC PA, EGLIN CR PA, and the USMC MAE MOA. There is also an Air Force command directive treating cultural resources (AFI 32-7065) as well as a binding internal document in the form of an Integrated Cultural Resources Management Plan (ICRMP) that dictates certain policies and procedures.

7.3.4. Responsibilities of Eglin and all Subsidiary DoD Missions Concerning Cultural Resources Historic structures and archaeological resources on federal land are protected by the federal laws outlined above.

7.3.4.1. There are consequences for violating these laws.

7.3.4.1.1. Individuals removing artifacts from subsurface deposits without a permit are subject to criminal penalties.

7.3.3.1.2 Organizations destroying historic properties without due process open the federal government to civil lawsuits that put USAF and all associated DoD agency projects and operations at risk of legal injunction and loss of project funding.

7.3.4.2. Individual missions are responsible for making their personnel aware of and respectful of these laws and regulations as well as the instructions contained within this document as they pertain to cultural resources at Eglin AFB.

7.3.4.3. Eglin CR personnel are available to brief appropriate staff members on the importance of protecting cultural resources (882-8459, 883-5201).

7.3.5. Areas Cleared by Eglin CR for Mission Activity.

7.3.5.1. As a general principle, there are three levels of cultural resources operating limitation on Eglin.

7.3.5.1.1. No Walk Zones. These buffer zones are off limits to troop movements, off-road vehicle operations, and digging or any type of ground surface disturbance. These areas contain archaeological resources that are on or near the surface that are potentially disturbed by such activity. This restriction does not apply to foot or vehicle traffic on existing roadbeds that pass through such zones.

7.3.5.1.2. No Vehicle/No Digging Areas. These high probability areas should be considered off limits to off-road vehicle operation or any type of ground penetrating activity. Disturbance of the soil in these areas has the potential to adversely effect known or as yet undiscovered historic properties. Existing roadbeds are excluded from this restriction.

7.3.5.1.3. Cleared Areas. These areas have no cultural resource concerns or restrictions. Many areas on the ETTC have been cleared for ground surface training exercises and weapons testing purposes.

7.3.5.2. Most ranges cleared for ground force training exercises have been cleared for ground surface activity only. The following rules therefore generally apply.

7.3.5.2.1. Training activities will be limited to the ground surface only. There will be no digging, trenching or other subsurface disturbances.

7.3.5.2.2. All vehicle traffic will be confined to existing roads.

7.3.5.2.3. Any deviation from these requirements must be cleared in advance by contacting Eglin CR (882-8459, 883-5201).

7.3.6. Securing Clearance for Mission Activity from Eglin CR.

7.3.6.1. All missions involving a use of land that has not been previously cleared by Eglin CR for that same type of activity must be cleared through Eglin CR via the Environmental Impact Assessment Process (EIAP). This will usually entail the completion of Form AF 813. The EIAP

office (882-0044) is the standard point of contact for information on how to fulfill this requirement.

7.3.7. Policy of Avoidance

7.3.7.1. Even on active ranges cleared for mission activity, all historic properties (defined as historic buildings, historic or prehistoric structures, and/or archaeological sites) will be avoided whenever possible in the course of any testing and training activity.

7.3.7.2. Coordinates of areas to be avoided and the level of avoidance should be obtained in advance of any operation through the Central Scheduling Enterprise (CSE).

7.3.7.3. Under some circumstances, Eglin CR can also provide current maps of buildings, structures, and areas to be avoided along with description of the avoidance measures to be employed and any boundary markers deployed to range management and range users upon request.

7.3.7.4. Given due notification by range management, Eglin CR will ensure that visual markers are in place in the area of concern to communicate the boundaries of off-limits areas. These markers will include one or more of the following.

7.3.7.4.1. Signage posted at close intervals at eye level.

7.3.7.4.2. Painted trees and vegetation.

7.3.7.4.3. Flagging tape.

7.3.7.4.4. Permanent fencing.

7.3.7.4.5. Other removable barriers.

7.3.8. Tentative and Sensitive Nature of Cultural Resources Information.

7.3.8.1. It should be understood that the surveying of cultural resources is an ongoing process at Eglin and the inventory is constantly evolving. Not only are new archaeological sites discovered but older buildings and structures are established as historic properties on a regular basis. In addition, some buildings, structures and sites are occasionally removed from protection.

7.3.8.1.1. Additional surveys are scheduled for many Closed Training Areas and Bombing and Test Ranges. Areas deemed high probability for containing cultural resources that have not yet been surveyed are NOT cleared by Eglin CR and therefore presently off-limits to all weapons testing and ground maneuvers.

7.3.8.1.2. Archaeological sites deemed not eligible for the National Register of Historic Places are considered insignificant and may be subsequently removed from protection through subsurface testing procedures. Many sites on active ranges have yet to be tested and may be scheduled for such by Eglin CR if they lie within the area of potential effect of upcoming mission activity.

7.3.8.2. For these reasons, it is not possible for Eglin CR to simply provide clients with a single definitive static map of cultural resources for purposes of making their own determinations of available terrain. Moreover, there is a need to limit access to cultural resources data due to the inherent vulnerability of many historic and prehistoric sites and structures.

7.3.8.2.1. Range managers must therefore maintain regular dialog with Eglin CR, access the CSE, and employ the EIAP process in order to ensure required avoidance of protected cultural resources.

7.3.9. Planning Tools.

7.3.9.1. Eglin CR and proponents will consult during the planning stages of each new project to ensure that project planners are aware of the locations of historic properties and areas of concern.

7.3.9.2. Eglin CR can provide information on the relative abundance and/or general location of cultural resource concerns in the form of maps, coordinates in CSE, or quantified lists by subcompartment that present the following.

7.3.9.2.1. Low Probability Areas. Areas of the range that are not known to contain eligible or potentially eligible historic properties, and are considered unlikely to contain such properties.

7.3.9.2.2. High Probability Areas (HPA's). Areas likely to contain eligible or potentially eligible historic properties and need to be surveyed.

7.3.9.2.3. Buffer Zones. Areas that contain known eligible and/or potentially eligible historic properties that require avoidance.

7.3.9.3. The areas outlined above entail the following restrictions.

7.3.9.3.1. All HPA's and Buffer Zones should be considered no vehicle/no digging areas. Disturbance of the soil in these areas has the potential to adversely effect known or as yet undiscovered historic properties. Existing roadbeds are excluded from this restriction.

7.3.9.3.2. All Buffer Zones are off limits to foot traffic and troop movements. They contain archaeological resources that are on or near the surface that are potentially disturbed by such activity. Existing roadbeds are excluded from this restriction.

7.3.9.3.3. Low Probability Areas entail no cultural resource restrictions, though inadvertent discovery protocol described in paragraph 7.3.10. remains in effect.

7.3.9.4. Any project that entails deviation from these restrictions is likely to involve further cultural resources survey, testing, and/or consultation with the State Historic Preservation Office and possibly Native American Tribal organizations.

7.3.10. Inadvertent discoveries.

7.3.10.1. Archaeological Deposits. If archaeological 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, the following actions are to be taken:

7.3.10.1.1. All disturbance of the ground surface shall cease and the discovery will be secured from further harm.

7.3.10.1.2. Eglin CR (882-8459 or 883-5201) shall be immediately informed of the discovery.

7.3.10.2. Human Remains. 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.

7.3.10.2.1. All disturbance of the ground surface in the area shall cease and the discovery will be secured from further harm until further notice.

7.3.10.2.2. Eglin CR shall be immediately informed of the discovery.

7.3.10.2.3. An Eglin CR archaeologist will investigate and consult with Eglin law enforcement in determining whether the remains are of forensic significance.

7.3.10.2.4. Activities may be cleared to proceed in between 3 and 30 days from notification, depending upon whether the remains are determined to be forensically significant, of Native American descent, or neither.

7.4. Waste Management.

7.4.1. General.

7.4.1.1. The goal of the Environmental Compliance Pollution Prevention Branch (CEVCP) is to help reduce production of waste materials and toxic pollutants through promotion of innovative new technologies, alternative raw materials, effective management practices, relevant training and efficient inventory control. Management guidance is provided for the Solid Waste, Recycling, and Hazardous Materials Management (HazMat Cell) programs. Pollution prevention philosophy is to be infused to all environmental programs to ensure efficient and cost-effective means of environmental stewardship and compliance.

ATTACHMENT G-3
SHPO CORRESPONDENCE AND CONCURRENCE

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 96TH TEST WING (AFMC)
EGLIN AIR FORCE BASE FLORIDA

Maria D. Rodriguez
Chief, Environmental Stewardship Branch
96 CEG/CEVS
501 Deleon Street, Suite 101
Eglin AFB FL 32542-5105

19 MAR 2013

Robert F. Bendus, Director
Division of Historical Resources
R.A. Gray Building
500 South Bronough Street
Tallahassee FL 32399-0250

Re: *Air and Ground Gunnery: Test Areas A-73, A-77, A-78, A-79, B-7, and B-75* Environmental Assessment (RCS 12-001)

Dear Mr. Bendus

An undertaking is currently planned at Eglin AFB that is subject to review under Section 106 of the *National Historic Preservation Act*. The undertaking can be described as follows:

The Air Force proposes to establish an authorized level of activity for Test Areas A-73, A-77, A-78, A-79, B-7 and B-75, based on an anticipated maximum usage (Attachment 1). By demonstrating that the individual and cumulative effects of this usage level would not result in significant environmental impact, the Air Force would adopt this level of activity as the maximum threshold baseline. This is the Environmental Impact Analysis Process (EIAP) baseline. The environmental analysis is accomplished by evaluating the effect that the military air-mission activities (e.g., dispensing munitions such as bombs, missiles and small arms, as well as countermeasures such as chaff and flares) and ground training mission (e.g., crossing terrain on foot, with all-terrain vehicles {ATVs}, military vehicles, ground combat simulation, and live small arms use) have on Eglin's natural, physical and cultural environment.

The Air Force desires to authorize the projected activity for Test Areas A-73, A-77, A-78, A-79, B-7 and B-75, replacing the current authorized level of activity, which was analyzed over seven years ago. Since that time activities have increased and changed significantly due to the tempo of the wars that the United States is engaged in and the new technologies employed.

A decision is to be made on the level of activity to be authorized, which includes changes in mission types, the combination of missions, and the level of intensity of missions. By authorizing a new level of activity and analyzing the effects of that level of activity, future similar actions may be categorically excluded from further environmental analysis. This will save both time and money in the review of proposed actions and will enable users to access the studied ranges more quickly and efficiently. Authorization of a new level of activity will streamline the environmental process, enhancing the Air Forces ability to quickly respond to high-priority or crisis requirements.

The Area of Potential Effects (APE) for the proposed activities includes 23 archaeological sites, one historic district, 1 historic cemetery and 8 historic structures (Attachment 2).

- A-73: Five archaeology sites: 8OK170,8OK171, 8OK1733, 8OK1734, 8OK1831,
- A-77: Two archaeology sites: 8SR2150, 8SR2151,
- A-78: One archaeology site: 8OK2671
- A-79: Nine archaeological sites: 8SR1333, 8SR1515, 8SR1531, 8SR1532, 8SR1541, 8SR1562, 8SR1559, 8SR1673,8SR1674
- B-7: No known sites
- B-75:
  - Protective Aircraft Shelters Historic District (8SR1895) consisting of 11 Cold War targets (8 dummy aircraft shelters 1-4,6,7,9 & 10 and 3 replica shelters 5,8 & 11).
  - Six Archaeology sites: 8Ok276, 8OK277, 8OK1053, 8OK2242, 8OK2841 & 8OK2872
  - Metts Cemetery
  - Eight structures: 1070 (8OK1344), 9400 (8OK1935), 9403 (8OK1937), 9405 (8OK1938), 9406 (8OK1664), 9408 (8OK1939), 9410 (8OK1941), 9411 (8OK1942)

Potential adverse effects from the proposed activities include the destruction or disturbance of cultural resources by increased and modified training activities and troop movement through the area. The following procedures have been proposed to avoid or mitigate these adverse impacts:

- the potentially eligible and eligible NRHP sites will be protected through avoidance by fencing or boundary marking,
- the location of the historic cemetery will be avoided,
- the inadvertent discovery of cultural resources will result in the cessation of all activities in the area, and the immediate notification of the Base Historic Preservation Officer and the Cultural Resources Management Office (CEVSH),
- continued maintenance and upkeep of the historic structures is required, and
- troop movement between the specified ranges will be addressed by a separate EA.

Given the protective measures outlined above Eglin believes that the proposed undertaking is unlikely to have any adverse effect on any of the nearby archaeology sites, historic structures, historic cemetery or the historic district.

Eglin is again pleased to work with you in protecting the cultural resources of the Base ard the state of Florida. Should you have any questions regarding the report please contact my representative, Lynn Shreve at 850-883-5201.

Sincerely

MARIA D. RODRIGUEZ, GS-14
Chief, Environmental Stewardship Branch

2 Attachments:
1. Training and Test Areas Map
2. Area of Potential Effects Map

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

April 17, 2013

Ms. Maria D. Rodriguez
Chief, Environmental Stewardship Branch
Department of the Air Force
96 CEG/CEVS
501 Deleon Street, Suite 101
Eglin Air Force Base, Florida 32542-5105

RE: DHR Project File Number: 2013-1508
RCS 12-001
Air and Ground Gunnery: Test Areas A-73, A-7, A-78, A-79, B-7, and B-75 Environmental Assessment
Eglin Air Force Base, Santa Rosa and Okaloosa Counties

Dear Ms. Rodriguez:

This office reviewed the referenced project for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*. The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*.

We note there are a number of historic resources located within and adjacent to the referenced teat areas. Based on the protective measures outlined in your letter, it is the opinion of this office that the above-referenced undertakings will have no adverse effect on historic resources conditioned that the protective measures are followed.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail *scott.edwards@dos.myflorida.com*, or at 850.245.6333 or 800.847.7278.

Sincerely,

Timothy A. Parsons, DSHPO for

Robert F. Bendus, Director
Division of Historical Resources
and State Historic Preservation Officer

PC: Lynn Shreve, Eglin AFB
Sandy Nelson, Eglin AFB

VIVA FLORIDA 500

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Commemorating 500 years of Florida history www.fla500.com

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APPENDIX H

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION (BIOLOGICAL ASSESSMENT)

EGLIN AIR FORCE BASE
Florida

U.S. FISH AND WILDLIFE SERVICE

FINAL

FORMAL ENDANGERED SPECIES ACT SECTION SEVEN CONSULTATION FOR AIR AND GROUND GUNNERY: TRAINING AND TEST AREAS A-73, A-77, A-78, A-79, B-7, AND B-75 AT EGLIN AFB, FL

JULY 2012

PRINTED ON RECYCLED PAPER

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ACRONYMS, ABBREVIATIONS, AND SYMBOLS

>	Greater than
<	Less than
46 TW	46th Test Wing
AFB	Air Force Base
BA	Biological Assessment
CCA	Core Conservation Area
dB	Decibel
dbh	Diameter at Breast Height
dB	Decibel
dBP	Decibels of Unweighted Peak Sound Pressure Level
ESA	Endangered Species Act
ETTC	Eglin Test and Training Complex
ft²	Square Feet
in	Inch
lb	Pound
NEW	Net Explosive Weight
NRS	Natural Resources Section
PBG	Potential Breeding Group
RCW	Red-cockaded Woodpecker
REA	Range Environmental Assessment
T&E	Threatened and Endangered
TA	Test Area
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance

1. INTRODUCTION

This Biological Assessment (BA) is being submitted to fulfill requirements under Section 7 of the Endangered Species Act (ESA). This report addresses potential impacts to all federally listed threatened and endangered (T&E) species and other sensitive species associated with the Preferred Alternative of the *Air and Ground Gunnery: Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75 Range Environmental Assessment* (REA) at Eglin Air Force Base (AFB), Florida (U.S. Air Force, 2012) (Figure 1-1). This BA, conducted by Eglin's Natural Resources Section (NRS), is meant to initiate the formal consultation process with the United States Fish and Wildlife Service (USFWS) pursuant to Section 7 of the ESA. The objectives of this BA are to:

- Document all federally listed T&E species and associated habitat that occur, or may potentially occur, on Eglin AFB near the Proposed Action.
- Identify the activities that have the potential to impact, either beneficially or adversely, those documented species.
- Determine and quantify to the extent possible what effects these activities will most likely have on federally listed species.

This consultation is programmatic and addresses current and future activities, and the related management practices, on all affected test areas.

Introduction

Figure 1-1. Location of Eglin AFB

2. DESCRIPTION OF PROPOSED ACTION

2.1 INTRODUCTION

Range operations at Eglin AFB are accomplished through the 46th Test Wing (46 TW). The 46 Test Wing Commander is responsible for day-to-day scheduling and managing the maintenance of this national asset. Test Areas (TAs) A-73, A-77, A-78, A-79, B-7, and B-75 make up a portion of the Eglin Test and Training Complex (ETTC) and support a variety of test and training missions such as ground combat training, air weapons deployment, and aircraft gun fire. Continued utilization of the ETTC requires flexible and unencumbered access to land ranges and airspace, which support Eglin AFB's operations. The ranges included in this BA are used for similar activities and are located in the same geographic area (ETTC west). This grouping of ranges allows the Air Force to address use, recovery and clean up more effectively. In addition, the availability of multiple similar ranges for combat live fire will increase scheduling flexibility to accommodate large-safety-footprint weapons with the least amount of interference with ground combat operations.

Aircraft operations over the ETTC include live fire, either for training or testing. Live fire may include any and all conventional arms and munitions, as allowed on the specific range and as outlined in Eglin Air Force Base Instruction (EAFBI) 13-212, *Range Planning and Operations* (U.S. Air Force, 2010a). Warheads may be live or inert depending on mission/training need and allowable range capacity. Live rounds contain explosives and are the same types used in warfare. Inert munitions contain less or no explosives.

Air and ground operations consist of air and ground forces exercising live fire together (gunships, fighters, bombers, remotely piloted vehicles, and rotary aircraft). This is a high-risk activity to the ground troops and is performed only at select ranges with capacity to safely accommodate this type of training. This capability is part of what makes the ETTC so critical to the Eglin military mission.

2.2 PROPOSED ACTION

The Proposed Action identified in the Air and Ground Gunnery REA is for the Air Force to establish an authorized level of activity for TAs A-73, A-77, A-78, A-79, B-7, and B-75, based on an anticipated maximum usage. Eglin AFB previously performed environmental analysis on mission activities in the 2004 *Air-To-Ground Gunnery: A-77, A-78, A-79, and B-7 Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 2004a) and on TA B-75 in the 2010 *Test Area (TA) B-75 Final Range Environmental Assessment (REA), Revision 1* (U.S. Air Force, 2010b). The ranges are already cleared for live and simulated fire, missile impact, aerial bombardment, and aerial strafing, though all activities are not authorized at all ranges. The Proposed Action provides for an additional surge capability in the test and/or training mission (including an overall increase in munitions use), addition of weapons systems (e.g., F-35, CV-22, remotely piloted vehicles, new armored vehicles), and additional live small arms test and training at TA A-73. During wartime, and at other times, a surge in mission activity may be necessary in order to maintain operational readiness.

Table 2-1 summarizes the approved uses of each range, as determined in EAFBI 13-212.

Table 2-1. Summary of Currently Approved Capabilities and Uses at Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Area	Capabilities and Uses	General Description	Authorized Munitions
A-73	Primarily used for mobile electronic systems for ground and flight tests such as a centralized bore sight tower facility and electronic systems test facility. Ground forces use the extreme western portion of A-73 for tactical training at a small arms firing range.	A-73 is a cleared area of about 1,290 acres and is located approximately 12 miles west of Eglin Main. This area is used for basing mobile air defense systems at test sites A-30 and A-31 located on the eastern side of A-73. Test sites A-30 and A-31 are improved fenced compounds with permanent concrete pads for locating multiple radar systems, gravel parking areas, several instrumentation and workbench trailers, four 120-foot test towers, and several bore sight and calibration towers.	Military-issue rifles, sniper rifles, submachine guns and pistols, all calibers and jacketed "ball" or "frangible ball" type ammunition up to 7.62 mm. Pyrotechnics, simulators, simunitions, and blank ammunition.
A-77	A-77 is used for tactical air-to-ground training in gunnery, bombing, and rocketry delivery. Dud-producing munitions can be employed in the designated ¾-mile-square dedicated impact area. Ground forces use this site as a tactical maneuver and live fire range. AFSOC has constructed an Urban Close Air Support Training Facility on the north side of A-77, and organizations wanting to schedule this facility must get approval from AFSOC prior to execution.	A-77 is an unscored, tactical air-to-ground target area located approximately 20 miles west of Eglin Main. This target area is ¾-mile square and contains various tactical targets such as vehicle convoys, bivouac areas, and gun emplacement. A Close Quarter Battle Site, Urban Close Air Support Training Facility, and improved HLZ (two spot) is located in the northwest corner of this test area.	Ground personnel: .38-cal, .45-cal, 7.62-mm, 9-mm, 5.56-mm, .50-cal, 40-mm TP grenades, smoke pots, signal and illumination flares, pyrotechnics, up to 5 pounds of TNT or C4, TOW-2, 66-mm LAW, and 84-mm AT-4s. Aerial: 7.62-mm, .50-cal, 20-mm, 25-mm, 30-mm, 40-mm, 40-mm TP grenades, 105-mm, 2.75-and 5.00-inch unguided rockets (TP/HE/WP), TOW-2, illumination flares and markers. Inert general purpose bombs: MK-82, MK-83, MK-84, MK76, MK-106, MK-117, BDU-33, BDU-45, BDU-48, BDU-50, BDU-56.
A-78	A-78 is used for tactical air-to-ground training in gunnery, bombing, and rocketry. Ground forces use this area as a tactical maneuver and live fire range. Dud producing munitions can be employed in the designated target area.	A-78 is an unscored tactical air-to-ground target area located approximately 6 miles northwest of Hurlburt Field. This target area is an approximately ¾-mile-square dudded impact area and contains various tactical targets such as vehicle convoys, bivouac area, missile site, and gun emplacement. Ground forces use this site as a tactical maneuver and live fire range.	Ground personnel: .38-cal, .45-cal, 7.62-mm, 9-mm, 5.56-mm, .50-cal, 40-mm TP grenades, smoke pots, signal and illumination flares, pyrotechnics, M18A1 Claymore anti-personnel mines, quarter stick of TNT or C-4, and M72A1 LAW. Aerial: 7.62-mm, .50-cal, 20-mm, 25-mm, 30-mm, 40-mm, 40-mm TP grenades, and 105-mm. DU is not authorized on this range. Also approved are 2.75-and 5.00-inch TP/HE/WP rockets and illumination flares and markers. Inert general purpose bombs consist of: MK-82, MK-83, MK-84, MK-76, MK-106, MK-117, BDU-33, BDU-45, BDU-48, BDU-50, and BDU-56.

Table 2-1. Summary of Currently Approved Capabilities and Uses at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75, Cont'd

Area	Capabilities and Uses	General Description	Authorized Munitions
A-79	A-79 has been used for a tactical air-to-ground test and training area with capability for air-to-water when the pond is filled.	A-79 is an unmanned, unscored tactical air-to-water target area located approximately 7 miles northwest of Hurlburt Field. In the past it included a water target area when the pond was filled.	9 mm, 5.56 mm, 7.62 mm, and .50 cal. The size of munitions that can be expended on A-79 is set by Range Safety on a case-by-case basis.
B-7	B-7 is used for side-firing weapon systems tactical air-to-ground training. Dud-producing munitions are authorized in the designated target area.	B-7 is a sparsely wooded area approximately 1 mile long by ½ mile wide adjacent to the northwest corner of B-75. This area is located approximately 18 miles northwest of Eglin Main.	25 mm, 30 mm, 40 mm,105 mm, illumination flares and markers. The size of munitions that can be expended on B-7 is set by Range Safety on a case-by-case basis.
B-75	B-75 is a multipurpose range used for air-to-ground, ground-to-air, air-to-air, and ground-to-ground tests. Air-to-ground tests include bombing, rocketry, and missiles. Targets may be of the stationary type, or remote-controlled moving vehicles may be used. Ground-to-air and air-to-air tests include missiles against remotely piloted vehicles. Ground-to-ground tests include guns and missiles against stationary and remote controlled moving targets. Munitions can be scored post-mission by survey or Contraves cinetheodolites located on or adjacent to the test area. Three of these cinetheodolites can track items to the ground over most of the test area. A target complex including stationary, moving, and pop-up targets operated and maintained by the Alabama Army National Guard is located on the range. B-75 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. Items tested on B-75 range from small munitions to stacks of numerous 500-pound bombs.	B-75 is a cleared rectangular area 3½ by 1½ miles located approximately 15 miles northwest of Eglin Main. The primary entry to B-75 is from RR 213.	Ground personnel: 5.56 mm, 7.62, 9 mm, .50 cal, 40 mm grenades (inert), LAW (inert), C-4 and TNT bare charges Aerial: 7.62 mm and .50 cal Range Safety sets the size of munitions on a case-by-case basis. The maximum NEW used on B-75 to date is 12,800 pounds.

Several future foreseeable activities are included in the Proposed Action. The first is additional Army ground operations on existing roads. These operations will be of similar size and scope to existing vehicle convoy training missions. Army ground operations would include use of the joint light tactical vehicle (JLTV) and mine-resistant ambush-protected (MRAP) vehicle which are four wheel drive armored vehicles weighing over 25,000 pounds (up-armored and loaded gross weight is estimated at 40,000 pounds). It also includes traditional vehicles historically and currently used on these ranges (tow/recovery vehicles, lowboy vehicles, water purification system vehicles, conventional trucks, high mobility multipurpose wheeled vehicle (HMMWV), suburban utility vehicles [SUVs] and all-terrain vehicles [ATVs]).

The Air Force Special Operations Command (AFSOC) anticipates phasing out some of their HH-60 helicopter based operations in favor of a CV-22 platform. This will include small arms, chaff, and flare use on TA A-77 and A-78 similar to what is approved already and conducted currently by the HH-60.

Small arms test and training capability would be added to TA A-73. In August 2010, a rubber chunk-style ballistic containment system (i.e., a bullet trap) was installed on the western portion of TA A-73, though no operations were reportedly conducted on this range. This system will be used for all live fire test/training. Further, it is anticipated that breach wall training operations may be incorporated in this area. Breach wall training would consist of approximately eight classes annually, composed of ten military personnel, detonating a maximum of 4 pounds of plastic explosive, twice per month. Small arms live fire capability is also added at TA A-79.

A training event may last two weeks or more and include multiple training objectives, including air components as well as ground components. Aircraft-dependant operations include airdrop of personnel and equipment on approved drop zones, assault landings on approved landing zones, infiltration/exfiltration of troops via land or air to include fast rope/hoist operations, electronic countermeasure training, and urban escort, as well as other in-air operations that are beyond the scope of the 2012 REA.

Ground training will involve troop infiltration/ exfiltration; airdrops of personnel and equipment; call-for-fire; personnel recovery; terminal attack control; survival, evasion, resistance, escape; and sniper/survey reconnaissance. All of these activities are currently scheduled daily on the ranges by 1 SOW, 720 STG, 7SFG(A), and the HAVE ACE Program LNO (USSOCOM) residing at Hurlburt Field. Ground activity insertions/extraction would typically involve teams of up to 12 in approved areas. Other ground training events would consist primarily of single scheduled events for marksmanship training, combat marksmanship movement drills, dismounted movement drills, direct control close air support, close quarter battle, breaching (explosive, mechanical, and ballistic); light arms training, light demolition training, mounted maneuver training, and advanced urban combat training.

Table 2-2 shows the quantity of expendables associated with the Proposed Action. These quantities are derived from all current and foreseeable future mission activities that are expected to occur, and provide capacity for a test or training surge. The quantities therefore represent the maximum level of potential activity.

Table 2-2. Summary of Expendables Potentially Used at Training and Test Areas A-73, A-77, A-78, A-79, B-7, and B-75

Test Area	Ordnance	Expendable Use	Expendable Net Explosive Weight (lb)
A-73	Small Arms – live	1,000,000	
3,791.00	Explosives	192	174.72
	Total	**1,000,192**	**3,965.72**
A-77	Bomb – inert	1,120	0.14
	Flare	31,596	23.44
	Gun – inert	288,376	577.76
	Gun – live	908,544	160,175.24
	Missile – live	8	9.10
	Small Arms – inert	63,444	53.29
	Small Arms – live	7,598,268	28,805.03
	Smoke	1,780	0.94
	Miscellaneous Expendables	159,068	10.02
	Total	**9,052,204**	**189,654.98**
A-78	Bomb – inert	224	0.03
	Flare	31,596	23.44
	Gun – inert	200,244	401.19
	Gun – live	909,036	160,282.65
	Missile – live	24	27.31
	Small Arms – live	5,676,760	21,520.60
	Small Arms – inert	15,860	13.32
	Smokes	788	0.42
	Miscellaneous Expendables	146,424	9.23
	Total	**6,980,956**	**182,278.19**
A-79	Bomb – live	16	2,457.60
	Miscellaneous Expendables	71,068	4.48
	Small Arms - live	1,775,370	6,730.43
	Total	**1,846,454**	**9,192.51**
B-7	Flare	13,378	9.93
	Gun – inert	129,860	260.17
	Gun – live	320,542	56,511.18
	Small Arms - live	4,950	18.76
	Miscellaneous Expendables	96,652	6.09
	Total	**565,382**	3,791.00
B-75	Bombs	4,112	1,935
	Smokes	1,000	0.53
	Flares	78,601	58.32
	Explosives	519,676	472,905.16
	Missiles	1,228	1,397.46
	Rockets	1,928	1.10
	Small Arms - live	16,710,123	63,348.08
	Miscellaneous Expendables	148	0.01
	Total	**17,316,816**	**537,711**

Source: U.S. Air Force, 2012
lb = pounds; NEW = net explosive weight

2.3 CONSERVATION MEASURES

This BA was prepared with the expectation that the following conservation measures will be implemented for all activities on the TAs. Generally, action proponents are responsible for ensuring these measures are adhered to. Exceptions include measures to minimize RCW cavity tree mortality, which would be implemented by the Eglin NRS.

Noise

Firing activities should occur at regular intervals, when possible. Haphazardly timed and variable noise creates higher levels of disturbance to wildlife.

Wildfire Prevention

The largest potential agent for habitat alteration on and around the test areas is wildfire. The following measures would minimize the potential for wildfires:

- Follow Eglin Wildfire Specific Action Guide Restrictions for pyrotechnics use by class day; specifically, do not conduct hot missions under class D or E levels as determined by the Wildland Fire Management Program at Eglin Natural Resources Section.
- Through Eglin Natural Resources Section, have sufficient resources (i.e., fire management personnel and equipment) available to respond to fire emergencies.
- Maintain graded road grid around Preferred Alternative TAs to facilitate suppression in the event of a wildfire ignition.
- Prioritize prescribed fire in the vicinity of these test areas, so that an approximately two-year burn interval is maintained to reduce hazardous fuel accumulations.
- Per the Eglin Wildfire Specific Action Guide, establish post-mission fire watch of 20 to 30 minutes to search for smoke/fire from mission activities, unless otherwise directed by Eglin Natural Resources Section.
- Immediately notify Eglin Fire Dispatch of any wildfire.

Red-cockaded Woodpecker

Wildfire impact to cavity trees is the biggest threat to RCW recovery on Eglin. In addition to the wildfire prevention measures listed above, implementation by the Eglin Natural Resources Section of the following would minimize RCW cavity tree mortality:

- Prep RCW cavity trees before prescribed burns by removing fuels from around the trees.
- When monitoring RCW cavity trees adjacent to these ranges, record cause of mortality.
- Eglin Natural Resources Section would replace any cavity tree damaged by fire to the point it is unsuitable for nesting or roosting within 72 hours with a box insert. Roost checks would not be conducted since it would be uncertain as to which bird would have been using the tree. Eglin Natural Resources Section would conduct a roost check and visually inspect the cavity tree if the fire burned up the bole of the tree past the cavity.

Adherence to the *Management Guidelines for the Red-cockaded Woodpecker on Army Installations* (U.S. Army, 2007) would minimize potential noise and disturbance to RCWs from ground movement activities. An important component is the recognition of a 200 foot buffer zone around individual RCW cavity trees where certain activities are restricted. The USFWS has agreed with the U.S. Army that transient foot traffic within 200 feet of cavity trees would have no effect on RCWs, nor would transient vehicle traffic that stayed on existing roads. Transient activities are defined as those that involve maneuver-type training, have low-intensity human activity, and a short-term (less than two-hour) human presence. Activities that are not allowed within the 200-ft buffer zone include bivouacking and establishing command posts and excavating/digging.

Active and inactive RCW trees are marked with one band of white paint. The proponent may be required to utilize a 200 foot buffer zones around active RCW cavity trees potentially impacted by ground movements and follow Air Force Instruction 13-212 training restrictions within buffer the buffer zone. Monitoring of RCWs would continue under the Eglin Integrated Natural Resources Management Plan (INRMP). A complete list of allowed and restricted activities is provided in Table 2-3.

Table 2-3. Restricted and Permitted Training Activities within RCW Buffer Zone

Maneuver and Bivouac	Allowed
Hasty defense, light infantry, hands and tool digging only, no deeper than 2 feet, 2 hours maximum	Yes
Hasty defense, mechanized infantry/armor	No
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; hardwood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than 2 hours	Yes
Weapons Firing	**Allowed**
7.62 mm and below blank firing	Yes
.50-caliber blank firing	Yes
Artillery firing point/position	No
MLRS firing position	No
All others	No
Noise	**Allowed**
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman type devices	Yes
Pyrotechnics/Smoke	**Allowed**
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil and/or graphite flakes[3]	Yes
Smoke grenades	Yes

Table 2-3. Training Activities within RCW Buffer Zones, Cont'd

Maneuver and Bivouac	Allowed
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
HC smoke of any type	No
Digging	**Allowed**
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

Additional RCW management requirements are as follows:

- Targets should be oriented so weapons are fired away from active RCW cavity trees.
- Helicopter landing zones used for recurring activities must not be located within 500 feet of active RCW trees.
- Cutting of RCW cavity trees (marked with one band of white paint) is prohibited.
- Cutting of any longleaf pine tree is prohibited without prior authorization.

Flatwoods Salamander Habitat

- No off-road vehicle traffic, digging, or vegetation cutting is allowed with a 1,500 foot buffer of confirmed and potential flatwoods salamander habitat.
- Vehicles must remain on existing roads when moving through or near the 1,500 foot buffer.
- Do not release toxic aerosols within 1,500 feet of salamander ponds.
- For training that will occur repeatedly in areas with flatwoods salamander habitat, field maps must include these locations so troops can appropriately apply the above requirements.

Eastern Indigo Snake

- If an eastern indigo snake is sighted, stop activities until the snake is out of harm's way.
- Notify Eglin Natural Resources Section of the sighting.

Gopher Tortoise

- If a gopher tortoise is sighted, stop activities until the tortoise is out of harm's way.
- Notify Eglin Natural Resources Section of the sighting.
- Do not drive over, step in, fill, or in any way cause a tortoise burrow to collapse.
- Avoid gopher tortoise burrows by at least 25 feet.

- Prior to any land clearing, coordinate with Eglin Natural Resources Section regarding required gopher tortoise surveys.

Florida Bog Frog

- No off-road vehicle traffic, digging, vegetation, or pyrotechnics/munitions use is allowed within 100 feet of bog frog streams.
- Remain on established roads when crossing bog frog streams.

Burrowing Owl

- For missions involving off-road vehicle use or other ground-disturbing activities near burrowing owl burrows, contact Eglin Natural Resources Section as it may be necessary to install markers near the burrows for avoidance.
- Stay at least 25 feet away from marked and unmarked burrows.

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3. BIOLOGICAL INFORMATION

Of the 12 federally listed threatened and endangered species that occur on Eglin AFB, 3 are found on or in the vicinity of the affected TAs. In addition, one federal candidate species and multiple state listed species also occur on or near the action area. Sensitive species and habitats with known or potential occurrence are listed in Table 3-1. Species and habitat locations are shown on Figure 3-1 and Figure 3-2.

Table 3-1. Sensitive Species with Known or Potential Occurrence on the Test Areas

Common Name	Scientific Name	Status	Test Areas
Amphibians			
Reticulated flatwoods salamander	*Ambystoma bishopi*	FE, SE	A-77, A-78, A-79, B-75
Florida bog frog	*Rana okaloosae*	SSC	A-78, A-79
Gopher Frog	*Lithobates capito*	SSC	A-79,B-75
Pine barrens treefrog	*Hyla andersonii*	SSC	A-79,B-75
Reptiles			
Eastern indigo snake	*Drymarchon couperi*	FT, ST	All test areas
Gopher tortoise	*Gopherus polyphemus*	FC, ST	All test areas
Florida pine snake	*Pituophis melanoleucus*	SSC	All test areas
Birds			
Red-cockaded woodpecker	*Picoides borealis*	FE, SE	All test areas
Southeastern American kestrel	*Falco sparverius paulus*	ST	All test areas
Florida burrowing owl	*Athene cunicularia floridana*	SSC	All test areas

FC = Federal candidate species
FT = Federally threatened
SSC = State species of special concern
FE = Federally endangered
SE = State endangered
ST = State threatened

3.1 FEDERALLY LISTED SPECIES

3.1.1 Red-cockaded Woodpecker

The red-cockaded woodpecker (RCW) (*Picoides borealis*) is listed as a state and federal endangered bird species. 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, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, the USFWS identified Eglin AFB as 1 of 13 primary core populations for the RCW (U.S. Air Force, 2006).

In 2009, the RCW population on Eglin reached the designated recovery goal of 350 Potential Breeding Groups (PBGs) and reconsultation was completed for future management of the species. In addition to the goal of 350 PBGs, NRS personnel have developed a long-term goal of 450 PBGs in order to allow for more mission flexibility. The area required to reach the long-term population goal of 450 PBGs is included within the Core Conservation Area (CCA) (Figure 3-3). The CCA is a delineated area on Eglin in which endangered species habitat management actions are focused. As of 2011, the population size was 443 active clusters and 401 PBGs (Figure 3-4).

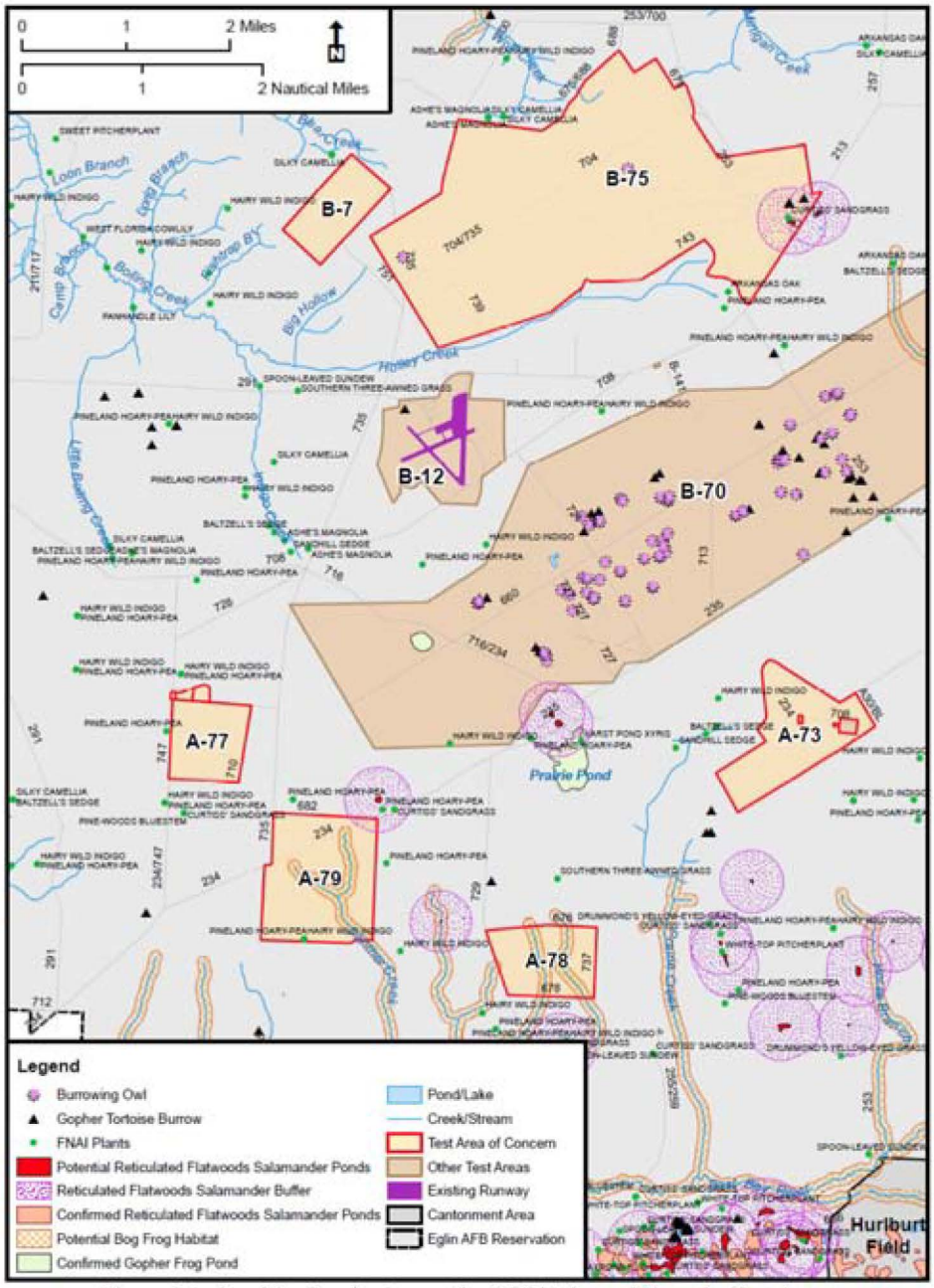

Figure 3-1. Sensitive Species (except for RCWs) On and Near the Test Areas

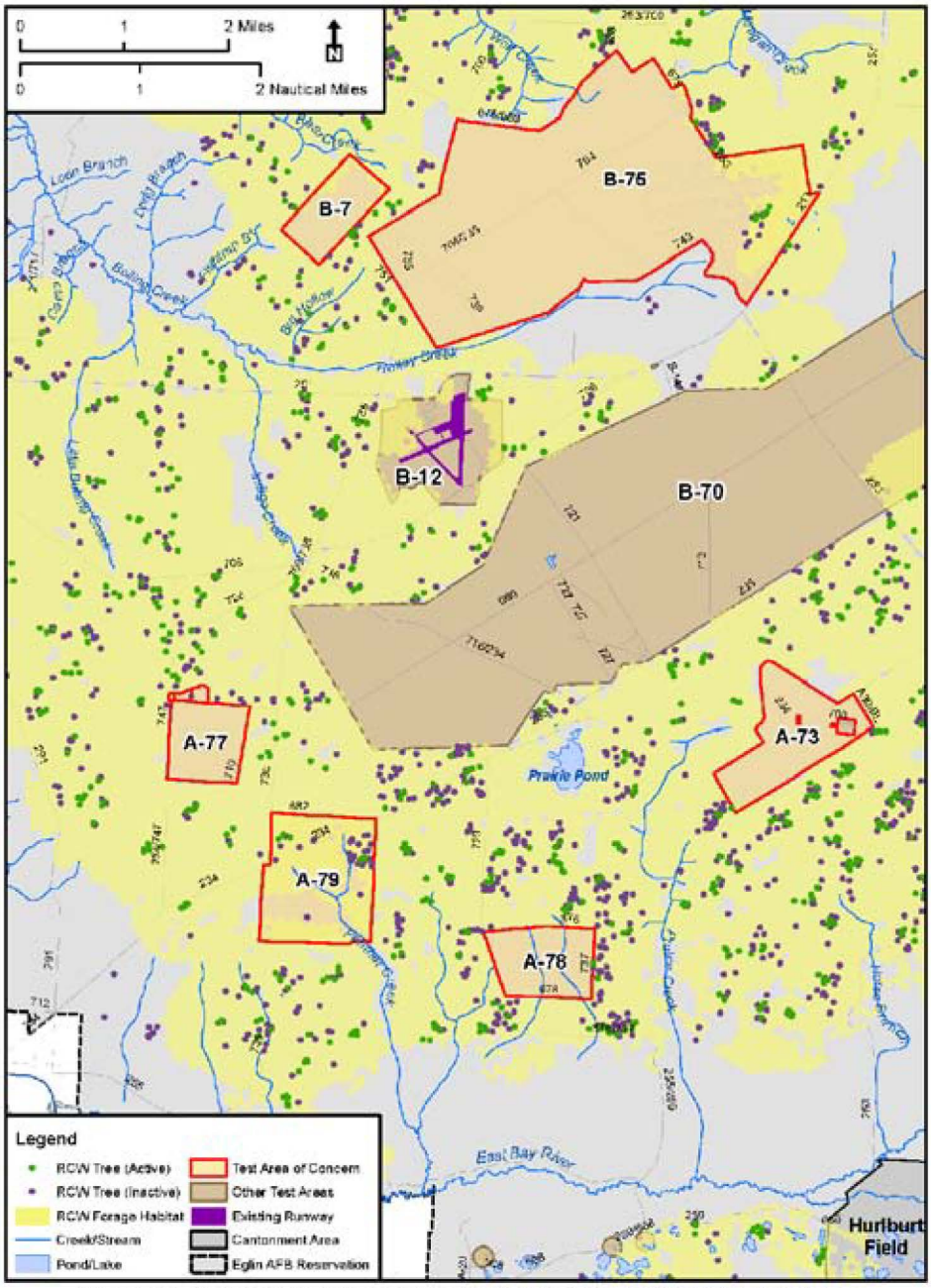

Figure 3-2. Red-cockaded Woodpecker Cavity Trees On and Near the Test Areas

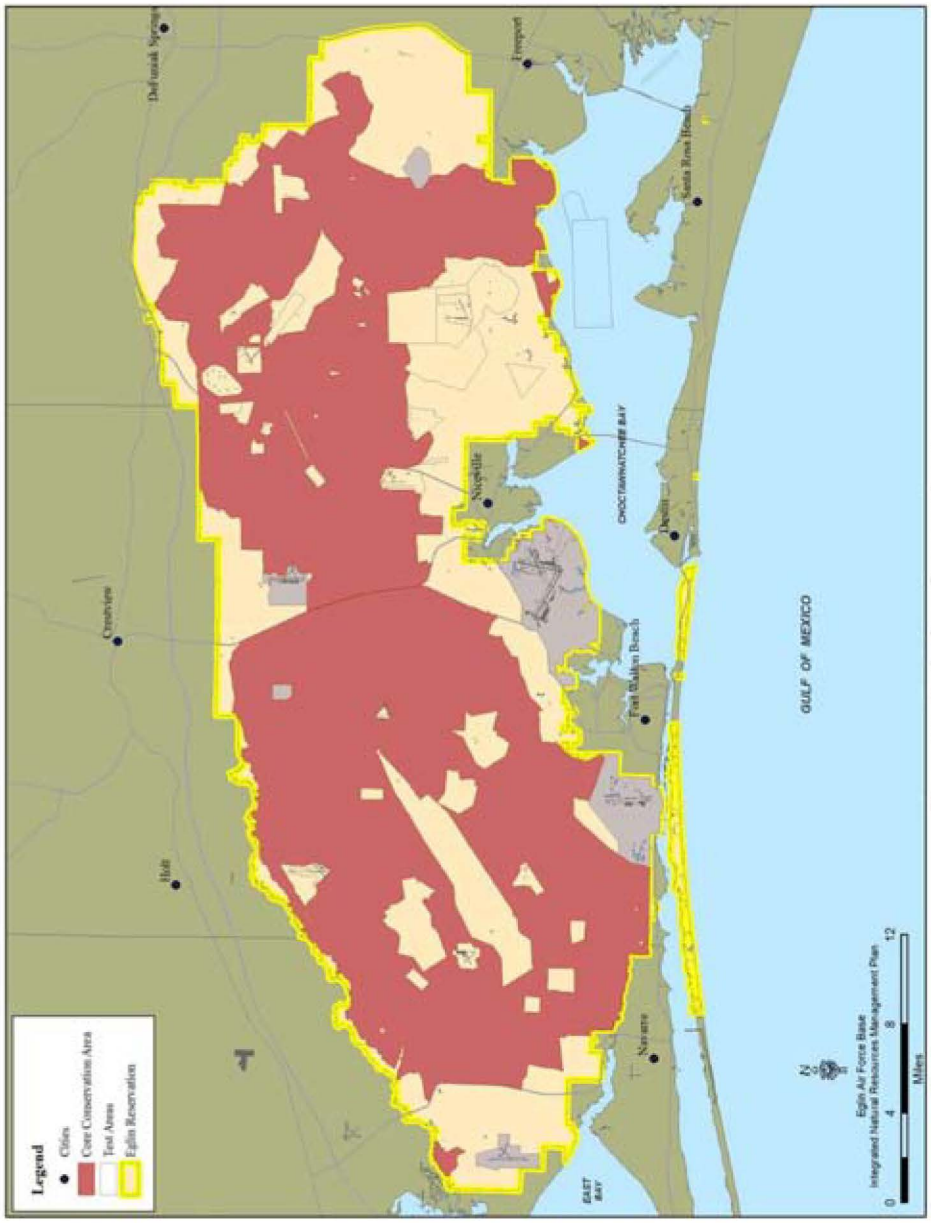

Figure 3-3. Eglin Core Conservation Area

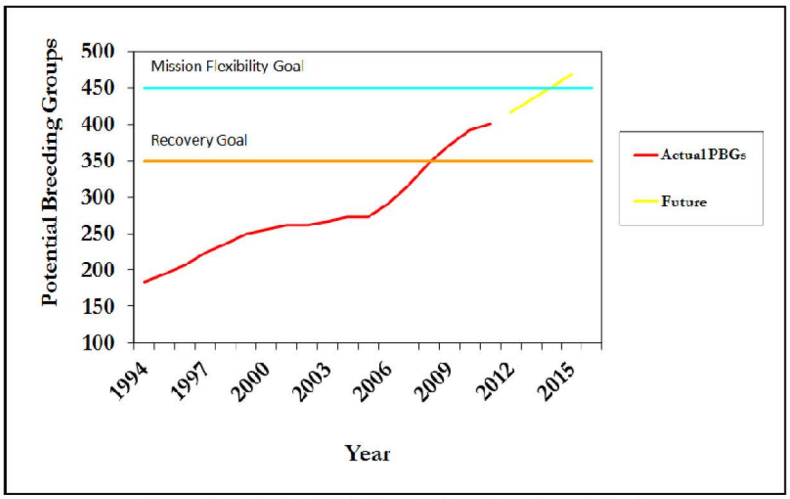

Figure 3-4. Eglin RCW Population Trends and Goals

Eglin maintains GIS location information for active RCW cavities, which are defined as any tree containing one or more cavities that are utilized by the RCW, and RCW foraging habitat around active clusters of RCW cavities (Figure 3-2). The Eglin RCW population is divided into the eastern subpopulation, which comprises all clusters east of Highway 85, and the western subpopulation, which is comprised of all clusters west of Highway 85. The western subpopulation is large and increasing (327 PBGs in 2011). The eastern subpopulation is smaller and is slowly increasing (74 PBGs in 2011). The TAs included in this BA are located in areas associated with the western subpopulation.

RCW Habitat

These birds primarily feed on spiders, ants, cockroaches, centipedes, and insect eggs and larvae that are excavated from trees. Dead, dying, and lightning-damaged trees that are infested with insects are a preferred feeding source. High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height (dbh) averaging 10 inches and larger. 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 et al., 1979). Depending on site productivity, different amounts of foraging habitat are required. In systems with medium to high productivity, only 120 acres may be needed, whereas sites with low productivity may need 200 to 300 acres of foraging habitat (USFWS, 2003). The NRS has determined that Eglin RCW groups utilize large areas for foraging habitat, thus Eglin generally manages for 300 acres per cluster with the allowance of 30 percent overlap with surrounding clusters.

General population recommendations for good quality foraging habitat include 18 or more stems per acre that are greater than 60 years in age and greater than 14 in dbh. Site conditions at Eglin are generally poor; the result is that longleaf pine tends to have smaller dbhs and lower densities than much of the rest of the RCW's range. Good quality foraging habitat on Eglin is defined as habitat that contains between 19 and 33 stems per acre of pines that are greater than 10 in dbh.

Another requirement for good quality habitat is that it contains forbs and bunchgrasses in the understory, and has sparse or no hardwood midstory.

Eglin has developed an independent Oracle-based GIS tool (model) that creates foraging habitat assessments, allowing Eglin to consistently and accurately estimate the available foraging resources without sampling the entire Reservation (U.S. Air Force, 2006). The USFWS completed ESA Section 7 consultation on the model in June 2003, and concurred with Eglin NRS findings of "not likely to adversely affect." Research has demonstrated that foraging analyses such as Eglin's model accurately portray the actual territories of RCW groups (Convery and Walters, 2004).

The greatest threat to the RCW population is loss and fragmentation of its habitat. If timber is to be removed within 0.5 miles of active cavity trees, then a forage habitat analysis must be completed to determine potential impacts. Consultation is required if resulting resources fall below USFWS guidelines (USFWS, 2003).

Eglin NRS has consulted with the USFWS on the guidelines for the habitat conditions and foraging requirements for RCWs on Eglin. Eglin NRS personnel use the guidelines identified in the *Threatened and Endangered Species Component Plan* (U.S. Air Force, 2006) when determining whether consultation with the USFWS is required. Table 3-2 is a comparison of the current Recovery Plan foraging standards and Eglin specific standards.

Table 3-2. Foraging Habitat Variable Standards for Red-cockaded Woodpeckers

Measure	USFWS Recovery Standard	USFWS Managed Stability Standard	Eglin Recovery Standard	Eglin Managed Stability Standard
Acres	200–300	75	300	150
Density (stems per acre)	18 > 14 in dbh	None	20 > 10 in dbh	None
Density total (stems per foraging area)	None	None	6,000 > 10 in dbh	3,000 > 10 in dbh
Basal area (ft^2 per acre)	20 >14 in dbh	40-70 > 10 in dbh	20 > 10 in dbh	None
Basal area total (ft^2)	None	3,000 > 10 in dbh	6,000 > 10 in dbh	4,000 > 10 in dbh
Distance from cluster	0.5 mile	0.25 mile	0.5 mile	0.3 mile
Midstory height	7 feet	7 feet	7 feet	7 feet
Ground cover	>40% herb	None	> 40% herb	None

> = greater than; < = less than; dbh = diameter at breast height; ft^2 = square feet; in = inch

The first column contains the values defined in the Recovery Plan as the recovery standard for public lands. The second column contains the values defined in the Recovery Plan as the Managed Stability Standard for private lands in order to protect existing groups (USFWS, 2003). The last two columns are recommendations for Eglin's Recovery Standard and Managed Stability Standard. A "no effect" determination would be made if a cluster's foraging resources exceed Eglin's Recovery Standard after the completion of a proposed action. A "not likely to adversely affect" determination would be made if a cluster's foraging resources fall between Eglin's Recovery Standard and Eglin's Managed Stability Standard after the completion of a proposed action. A "likely to adversely affect" determination would be made if a cluster's foraging resources fall below Eglin's Managed Stability Standard after the completion of a

proposed action. Also, if the proposed action affects less than 1 percent of the foraging resources, and the foraging resources are above Eglin's Managed Stability Standard, then no consultation would be required.

3.1.2 Reticulated Flatwoods Salamander

The reticulated flatwoods salamander (*Ambystoma bishopi*) is state and federally listed as endangered. Based on molecular and morphological analyses, Pauly et al. (2007) proposed the separation of the flatwoods salamander into two species. The division lies along the Apalachicola-Flint Rivers with reticulated flatwoods salamanders (*Ambystoma bishopi*) inhabiting areas to the west and frosted flatwoods salamanders (*A. cingulatum*, federally threatened) ranging to the east of the rivers. There are 20 known breeding ponds for the flatwoods salamander on the Eglin Range, along with numerous potential breeding ponds; 14 of the potential ponds occur in the vicinity of the action area (Figure 3-1). Additionally, the Eglin Range supports habitat around the known and potential breeding ponds (Figure 3-1). On 10 February 2009 the USFWS issued a notification in the *Federal Register* that no critical habitat would be designated for the reticulated flatwoods salamander on Eglin AFB (*Federal Register*, 2009).

Optimal habitat for this small mole salamander is open, mesic (moderately wet) woodlands of longleaf or slash pine flatwoods maintained by frequent fires and that contain shallow, ephemeral wetland ponds. Males and females migrate to these ephemeral ponds during the cool, rainy months of October through December. 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 (U.S. Air Force, 2006).

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. Flatwoods salamander habitat is also threatened by the introduction of invasive, non-native species. Flatwoods salamanders and their active breeding wetlands both appear to have declined in number since the original Eglin surveys in 1993 and 1994. This is possibly due in part to several years of drought in the late 1990s and early 2000s. Wetlands may not have remained wet long enough for larvae to complete metamorphosis if rainfall amounts were not sufficient. This has resulted in little population recruitment over the last decade at Eglin's wetlands (U.S. Air Force, 2006).

The USFWS guidelines in the Federal Register, dated 1 April 1999, establish a 450-meter (1,476-foot) buffer area from the wetland edge of confirmed breeding ponds. Within the buffer area, the guidelines restrict ground-disturbing activities in order to minimize the potential for direct impacts to salamanders, the introduction and spread of invasive non-native plant species, and alterations to hydrology and water quality.

3.1.3 Eastern Indigo Snake

The eastern indigo snake (*Drymarchon couperi*) is listed as a federal and state threatened species, and 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 gopher tortoise burrows and the burrows of others species for over-wintering. The snake frequents 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 (U.S. Air Force, 2006).

The species is extremely uncommon on the Eglin Range with the sighting of only 29 indigo snakes from 1956 to 1999, and no reported sightings since 1999 (Gault, 2009). Most of these snakes were seen crossing roads or after being killed by vehicles. It is difficult to determine a precise number or even an estimate of the number of these snakes due to the secretive nature of this species.

3.2 OTHER SPECIES CONSIDERED

3.2.1 Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is a federal candidate and state threatened species. In December 2008, all Department of Defense entities, including the Air Force, as well as state agencies and other non-governmental organizations, signed a Candidate Conservation Agreement with the USFWS. This agreement defines what each agency will voluntarily do to conserve the gopher tortoise and its habitat. The *Federal Register* Vol. 76, No. 144 / Wednesday, July 27, 2011 documented the 12-month finding on a petition to list the gopher tortoise as threatened in the eastern portion of its range. The review found that the listing of the gopher tortoise is warranted; however, listing is precluded by higher priority actions. The *Federal Register* notice also states that the species will be added to the federal candidate list and a proposed rule to list the gopher tortoise will be developed as priorities allow.

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 climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September. Gopher tortoise burrows serve as important habitat for many species, including the federally listed eastern indigo snake.

3.2.2 Florida Bog Frog

The Florida bog frog (*Rana okaloosae*), listed as a species of special concern by the state, can only be found within Walton, Okaloosa, and Santa Rosa Counties and is known from fewer than 100 sites (FWC, 2011). The bog frog has been found in several aquatic habitats including spring seeps, boggy overflows of larger seepage streams, sluggish bends in streams, and pond edges. They are frequently associated with sphagnum moss (*Sphagnum* spp.). Most of the habitat for the frog lies on Eglin AFB property with all known locations of the frog in small tributary streams of the Yellow, Shoal, and East Bay Rivers. Potential bog frog habitat occurs in association with several small streams on and near the TAs (Figure 3-1).

3.2.3 Florida Pine Snake

The Florida pine snake (*Pituophis melanoleucus*) is a state species of special concern. The species is able to dig in loose sand and also enters rodent burrows and occasionally gopher tortoise burrows. The pine snake prefers sandhills, sand pine scrub, and pastures with dry, sandy soils and open canopies. Florida pine snake habitat is best managed by maintaining gopher tortoise populations and by keeping soil and ground disturbance to a minimum.

3.2.4 Florida Burrowing Owl

The Florida burrowing owl (*Athene cunicularia floridana*) is a state species of special concern. This species inhabits open, treeless areas with short groundcover (FWC, 2012). The owl creates burrows, similar to gopher tortoise burrows, in which to hide from predators, although they may use the burrows of other species. They are typically found in open habitats with short grasses and few trees. They spend most of their time on the ground and use burros year-round. These small owls have been documented on B-70 (Figure 3-1) but have also been seen on many TAs across the Eglin Range.

3.2.5 Southeastern American Kestrel

The southeastern American kestrel (*Falco sparverius paulus*) is state-listed as threatened. Kestrels prefer open or partly open sandhills habitat. Kestrels are relatively common on Eglin AFB, frequently utilizing the cleared test areas as foraging areas and nesting in cavities (most often in longleaf pine trees). Cavity trees may be dead or alive. Kestrels frequently nest in old growth longleaf pines that contain cavities originally excavated by RCWs. These cavities are usually enlarged by fox squirrels, pileated woodpeckers, or fire, making them large enough for kestrel use. Kestrels will readily use nest-boxes; however, Eglin appears to contain an abundance of suitable nesting habitat. Kestrels feed on insects (e.g., grasshoppers and crickets) and small vertebrates (e.g., snakes, lizards, birds, mice, and sometimes bats). They often utilize the tree line or utility poles adjacent to and within cleared test areas.

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4. EFFECTS DETERMINATION

This section discusses the potential impacts to protected species located within and adjacent to the action area. Analysis focuses on assessing the potential for impacts from Air and Ground Gunnery activities and on identifying methods to reduce the potential for negative impacts to protected species from these activities. Impact categories may include (depending on the species) direct physical impacts, noise, and habitat alteration. Direct physical impact refers to physical harm to listed species or associated habitat as a result of human activities. Possible examples include crushing, trampling, vehicle strikes, and munitions strikes. Noise impacts pertain to noise caused by gunnery activities and personnel/vehicle movements; aircraft noise is not within the scope of the Air and Ground Gunnery REA or this BA. A habitat refers to the ecological and geomorphological components, such as vegetation, soil, topography, and water, that support wildlife species. Habitat alteration in this analysis includes burrow collapse and wildfire.

Potential issues omitted from consideration include chemical material deposition, water quality alteration, erosion, debris, and electromagnetic radiation effects. Possible indirect effects resulting from migration of explosive material residue and metal contaminants into soil and water resources are discussed in the Air and Ground Gunnery REA and are not considered significant to biological resources. Impacts to wetlands and streams and the associated aquatic species due to erosion potential would be minimized by implementing the soils-related management requirements outlined in the REA. In addition, ground activities would be avoided in wetlands. Other debris (litter and refuse) should generally be removed by the user group and is not anticipated to affect biological resources. Radar use on TA A-73, which produces electromagnetic radiation, is conducted in compliance with human safety guidelines and is not expected to affect biological resources.

4.1 FEDERALLY LISTED SPECIES

4.1.1 Red-cockaded Woodpecker

Direct Physical Impacts

RCWs spend little time on the ground and are therefore unlikely to be physically impacted by troop or vehicle movements. Bombs, missiles, rockets, and bullets expended on the TAs are in many cases directed toward specific targets and are not expected to substantially impact trees where birds may be foraging. Random munitions strikes are possible but would be considered infrequent and would not likely result in population-level effects. There would be NO EFFECT to the RCW due to direct physical impacts.

Noise

Noise and other aspects of human presence may disturb wildlife, including RCWs. Noise is associated with airborne gunnery and ground-based activities. Airborne gunnery noise is produced from the propellant blast of gunnery munitions fired at altitude. Ground-based noise may result from detonations, small arms fire, the impact of gunnery rounds at ground targets, and personnel/vehicle movement. Noise can cause numerous responses in wildlife species. Effects can range from behavioral reactions such as startle/flushing response, cessation of normal activities,

and avoidance of an area, to long-term effects on reproduction such as decreased nesting success. Biochemical reactions can include the production of stress hormones. Human presence and general activities may deter animals from an area on a short-term or long-term basis.

Potential noise impacts to RCWs resulting from similar actions were analyzed previously in the *Air-to-Ground Gunnery: A-77, A-78, A-79, and B-7 Final Programmatic Environmental Assessment* (USAF, 2004). The maximum safe noise exposure level for humans without ear protection is 140 decibels (dB) of unweighted peak sound pressure level (dBP); due to the absence of a specific threshold for RCWs, this threshold is considered reasonable and possibly even conservative for estimating potential noise impacts to the species.

The largest munition used on each test area was analyzed relative to this metric. Overall, noise impacts to RCWs would not be considered significant. The largest ordnance currently used on TA A-79 is a 40-pound C-4 charge (in the past, live Mk-82 bombs were used and had a substantially greater impact area; this ordnance is no longer used and consultation with the USFWS would be necessary before reinitiating use). Provided C-4 detonations are conducted near the same location as analyzed in 2004, few to no active RCW trees would be impacted by noise levels of 140 dBP, although some foraging habitat could be affected. For TAs A-77 and A-78, the worst-case scenario of 25-pound rockets fired at targets close to RCW trees was analyzed. Over 20 RCW cavity trees could be impacted by the 140 dBP noise level. Rocket use was infrequent at these test areas (six events in four years). At TA B-7, 7-pound gunnery charges were the largest ordnance used, and again were conservatively assumed to be used at targets nearest RCW trees. Five RCW cavity trees could be exposed to 140 dBP noise levels. Use of 7-pound gunnery is frequent on the test area and the noise it produces is repetitious. Continuous noise at this level injures human ears; conservatively assuming injury level is similar in RCWs (damaged sensory hairs in the ear actually recover more readily in birds than in humans), impacts from the use of this ammunition would be of more concern than the infrequent rocket use on TAs A-77 and A-78. TA B-75 was not included in the 2004 analysis. Potential impacts associated with the largest munitions used on TA B-75 (C-4, TNT Bare Charges, and .50 cal) are expected to be similar or less than those described for the other TAs.

Gunnery noise may temporarily disturb RCW individuals or populations, and foraging individuals may avoid areas where disturbance is occurring. Pioneering RCWs may be affected by noise from daily operations and not colonize or immigrate to new areas within the test site or access roads. This could affect the growth of the RCW population adjacent to the proposed activity area. However, as reported in USAF (2004a and 2004b), no difference in group size or behavior of RCWs has been observed across Eglin near TAs supporting gunnery operations versus areas without such operations. RCWs on Eglin have demonstrated a degree of adaptability to noise and probably have become habituated to the noise of munitions at least to some extent, and continue to nest successfully in close proximity to the affected TAs. Suitable habitat appears to outweigh any negative influences associated with noise. The areas in proximity to TAs A-77 and A-78 are frequently burned due to mission-related wildfires and prescribed fire; this produces very good habitat for the RCW. Figure 4-1 shows that these areas around ranges that have many wildfires harbor the largest populations of RCWs on Eglin AFB. RCWs exposed to noise may exhibit reactions such as a startle reflex or temporary nest flushing, but significant population-level effects are not anticipated. Consultation with the USFWS regarding air-to-ground gunnery on TAs A-77, A-78, A-79, and B-7 (USAF, 2004b) concluded

that noise associated with munitions use was not likely to adversely affect RCW individuals or populations. However, it may be necessary to consult for noise impacts if detonations are repetitively conducted at locations near the same RCW trees, thereby potentially exposing the same individuals to frequent disturbance. Such a determination would be made through Eglin NRS review of specific activities.

In addition to gunnery noise, RCWs could be disturbed by human presence and associated disturbance, including vehicle use. Potential exists for noise impacts resulting from troop and vehicle movements; however, ground movement is minimal in these test areas due to unexploded ordnance (UXO) contamination. Troops generally stay within the confines of the TAs in permitted times and places, and RCW cavity trees are present only on A-77, A-78, and B-75. Movement between TAs is infrequent and involves low to moderate personnel movements. Therefore, no impacts to RCWs located near the sites are anticipated. Ground movements may disturb RCWs on the TAs on an intermittent, temporary basis. Startle or flushing reactions may occur, and individuals may avoid areas of frequent use. However, no significant population-level impacts are anticipated from these transient activities. In addition, the NRS will employ the conservation measures in Section 2.3, including observation of the *U.S. Army Management Guidelines for RCWs*, to minimize the negative effects of air and ground gunnery activities.

Therefore, noise and other human disturbances are NOT LIKELY TO ADVERSELY AFFECT the RCW.

Habitat Alteration

The use of munitions and pyrotechnics increases the risk of wildfires. In general, fire is beneficial to the longleaf, open grassland, and flatwood communities found on Eglin, including the affected TAs. Fire maintains the native groundcover that supports RCW prey items, and also hinders predator access to cavities by decreasing midstory encroachment. To maintain high quality RCW foraging habitat, prescribed fire is periodically implemented in active RCW clusters. In planned burn blocks, fire crews prepare all active RCW cavity trees by removing fuels from the immediate vicinity of the tree to reduce the potential for fire damage.

Wildfires, while beneficial in some cases, may in others have negative effects on habitats and species, particularly under dry or windy conditions. Wildfires can cause damage to sensitive habitats if they burn too hot, smolder, or if fire suppression activities are necessary. Wildfires have the potential to damage or kill active RCW cavity trees and trees in foraging habitat if the trees ignite, and may affect individual birds if they are present in the cavity at the time the tree is burning. Wildfires started by missions on these TAs have the potential to affect cavity trees both on the TAs and those trees present in the vicinity of the TAs. The majority of wildfire starts on Eglin AFB are located on and adjacent to A&GG ranges due to the frequent use of live ammunition and incendiary devices (Figure 4-1). RCWs are prevalent in most of these same areas that are frequently burned by wildfires (Figure 4-1).

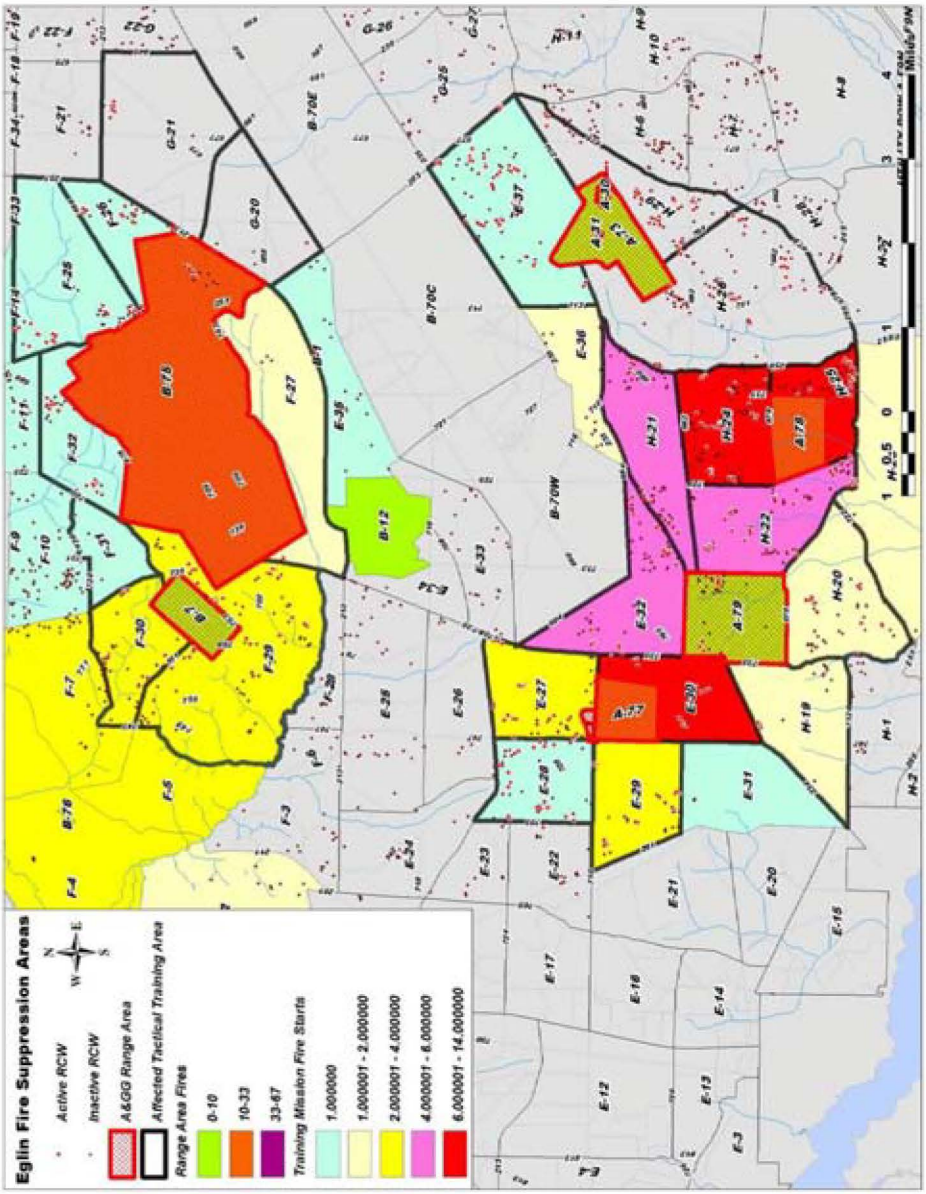

Figure 4-1. Mission Caused Wildfires on A&GG Ranges and Adjacent Interstitial TTAs.

Although RCWs thrive in fire dependent habitats and fire is a primary requirement for the species survival, there is a risk that fires can burn too hot and impact the cavity tree and/or its habitat. Mission caused wildfires are sometimes unpredictable and difficult to suppress. A recent change in firefighter safety policy has restricted NRS personnel from being present within certain portions of Eglin with high UXO possibility while fire is on the ground. The risk of UXO potentially in or on the ground in these "no suppression" and "restricted suppression" areas was deemed sufficient to require modified burning and suppression tactics to lower UXO explosion potential to protect personnel fighting fires. Traditional direct fire suppression methods, such as plowing firebreaks, are not an option and wildfires in these areas may be very difficult to control. Typically, wildland fire fighting in these areas is confined to block and burn techniques, where suppression teams set counter fires on the network of roads surrounding the ranges. This restriction increases the likelihood that, under adverse conditions, wildfires escaping from the ranges will grow large in size and potentially impact numerous active RCW cavity trees since access restrictions limit the ability of firefighters to protect RCW cavity trees within these areas. To minimize damaging wildfires in no suppression and restricted suppression areas with high wildfire potential, Eglin NRS prioritizes most of these areas for annual burning. Many of the no suppression and restricted suppression areas are on and near TAs A-77, A-78, A-79, and B-7 (Figure 4-2).

The following variables make it difficult to estimate how many RCWs and how much RCW habitat are potentially impacted by mission caused wildfires: weather, mission surges, herbicide application, proximity to test areas, limited and no suppression areas, prescribed fire frequency, and previous wildfires. Although many of the A&GG wildfires are contained within the TA boundaries, some move into the adjacent interstitial tactical training areas (TTAs). Using data from the Eglin Fire Decision Support System, activities on these A&GG TAs have been responsible for starting approximately 186 wildfire from 2007 to 2011 (37 per year) both on the test areas and in adjacent interstitial TTAs (Figure 4-1).

The following assumptions were made as part of the impact analysis:

- Eglin NRS conservatively estimates a 40% increase in wildfires over the next 10 years due to increased AFSOC and 7SFG(A) usage and other future mission surges.
- There would be no effect to RCW trees within the "no suppression burn annually areas."
- The potential for impacts to RCW trees from each individual wildfire was considered the same, regardless of fire frequency. In reality, the potential for negative impacts typically decreases as fire frequency increases due to a reduction in fuels, but this is difficult to quantify.
- Assumed two percent cavity tree mortality due to wildfire. Over the last 6 years, for active trees, mortality rate is 2% for all causes of mortality combined (Gault, 2012).

Approximately 426 active RCW trees are present within the area affected by wildfires, with 139 falling within the "no suppression burn annually" areas. Eglin NRS believes that there is NO EFFECT to RCWs within the "no suppression burn annually areas" due to fuel reduction, thus these trees were removed from impact analyses. To determine the number of active trees potentially killed annually, the remaining 287 trees outside of the "no suppression burn annually areas" were multiplied by the annual average number of wildfires for each respective TTA, then multiplied by two percent mortality, for estimated mortality of up to six active RCW trees annually (Table 4-1).

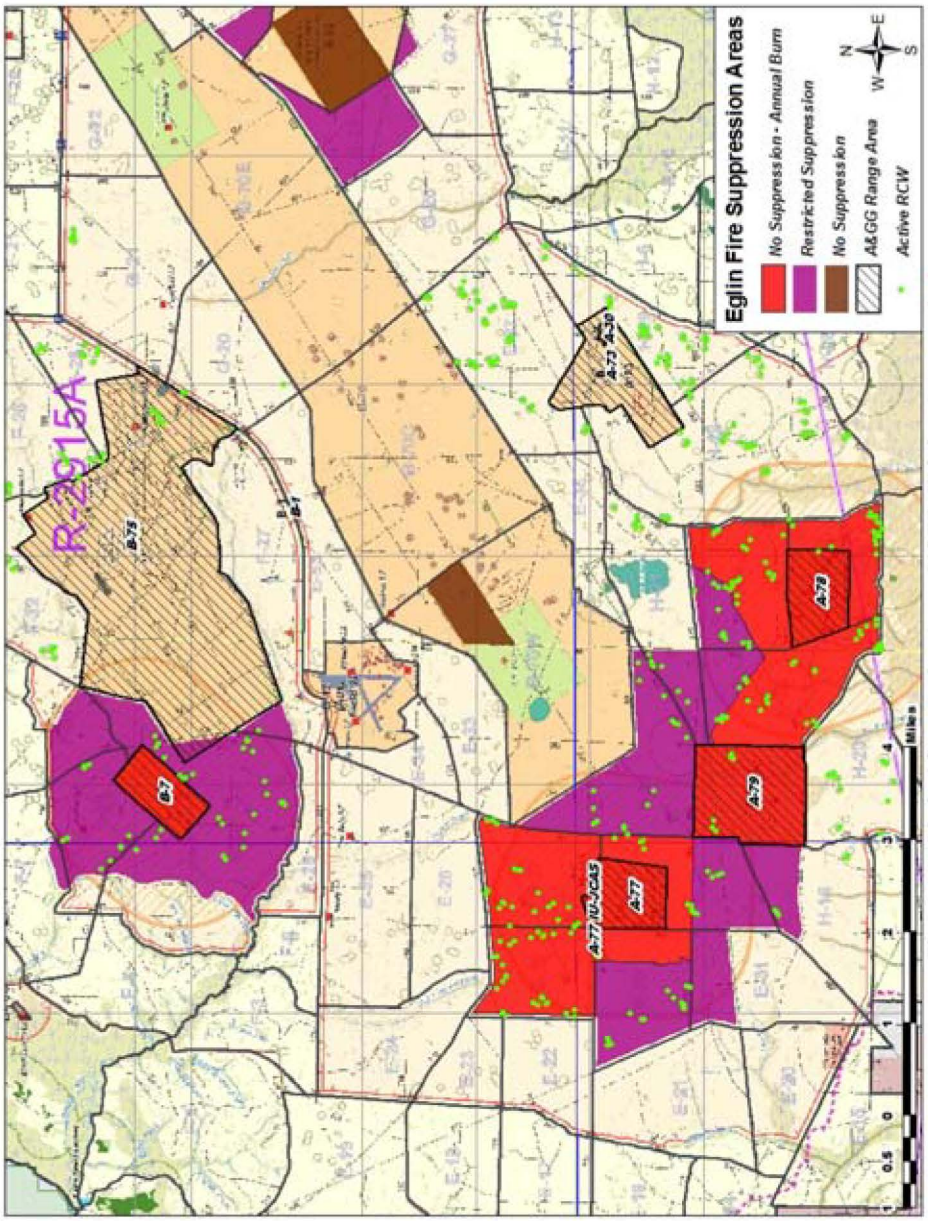

Figure 4-2. Limited Suppression Areas (NOTE: This is a data snapshot)

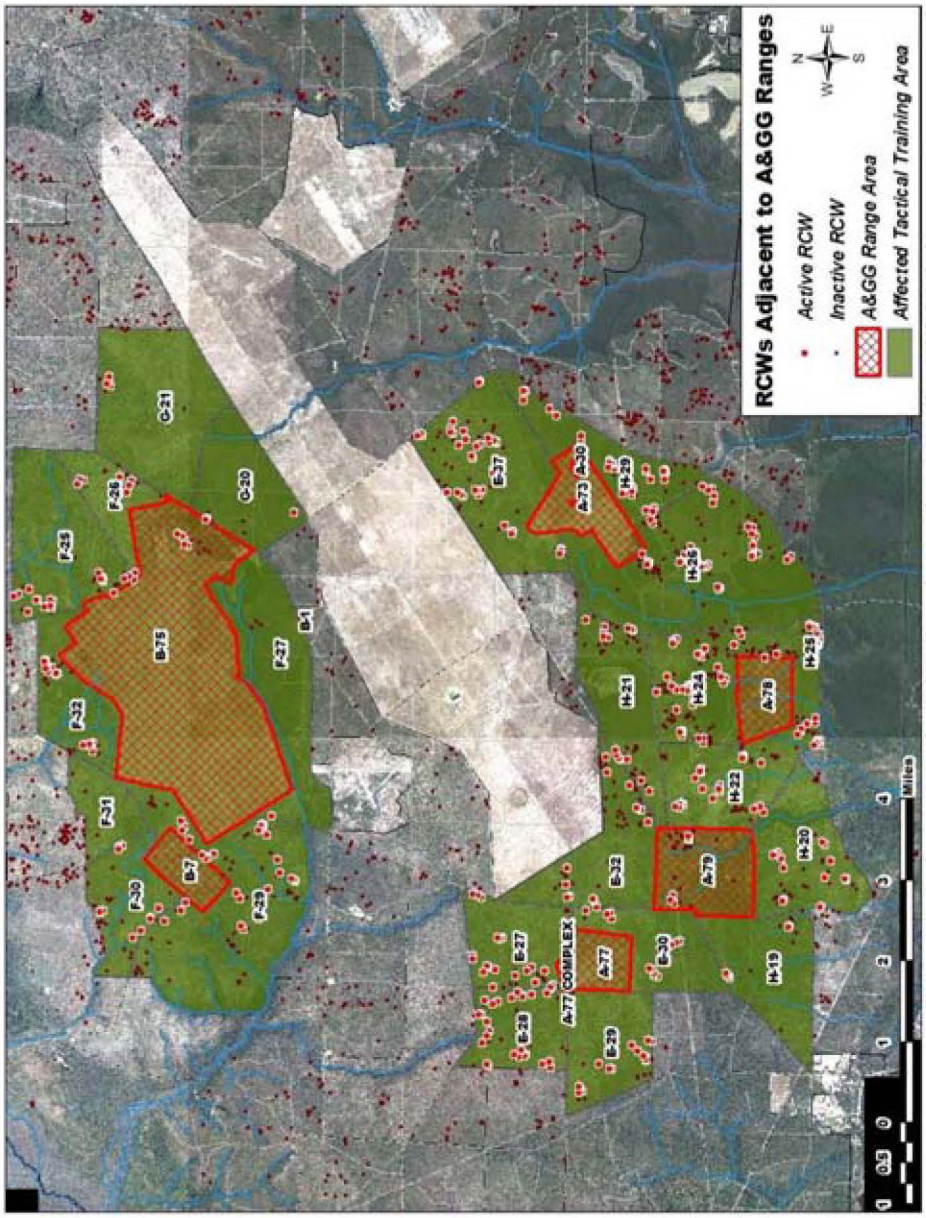

Figure 4-3. Active and Inactive RCW Trees in Localized TTAs for A&GG Missions

Table 4-1. Number of Wildfires, Active RCW Trees, and Predicted Cavity Tree Mortality

TTA	Annual Average # of Wildfires	# of Active RCW Trees *Outside* of "No Suppression Burn Annually Areas	# of active RCW Trees Potentially Impacted	# of Active RCW Trees Potentially Killed Annually
B-1	0.42	0	0	0.0
E-28	0.42	1	0	0.0
E-37	0.42	41	17	0.3
F-25	0.42	20	8	0.2
F-26	0.42	10	4	0.1
F-27	0.42	1	0	0.0
F-31	0.42	0	0	0.0
F-32	0.42	15	6	0.1
H-19	0.42	6	3	0.1
A-30	0.42	0	0	0.0
A-31	0.42	0	0	0.0
A-73	0.42	0	0	0.0
*A-79**	0.42	0	0	0.0
G-20	0.42	3	1	0.0
G-21	0.42	4	2	0.0
H-26	0.42	37	16	0.3
H-29	0.42	33	14	0.3
E-27	0.98	0	0	0.0
E-29	0.98	16	16	0.3
F-29	0.98	28	27	0.5
F-30	0.98	11	11	0.2
E-32	1.54	17	26	0.5
H-21	1.54	13	20	0.4
H-22	1.54	7	11	0.2
E-30	2.94	6	18	0.4
H-24	2.94	13	38	0.8
H-25	2.94	0	0	0.0
*B-7**	4.48	0	0	0.0
*A-78**	7.7	0	0	0.0
*B-75**	7.7	5	39	0.8
A-77*	7.7	0	0	0.0
TOTAL	**52.08**	**287**	**277**	**5.5**

* Indicates a Test Area;

NOTE: The annual average # of wildfires were obtained from Eglin NRS GIS database for years 2007-2011; the number of Active RCW Trees *Outside* of "No Suppression Burn Annually Areas were obtained from Eglin NRS GIS database on 7-13-12; the number of active RCW trees potentially impacted was obtained by multiplying annual average number of wildfire by number of Active RCW Trees *Outside* of "No Suppression Burn Annually Areas; the number of Active RCW Trees Potentially Killed Annually was obtained by assuming 2% mortality.

Per the INRMP, Eglin will follow these measures to minimize potential impacts to RCWs:

- Annually burn the "no suppression annually burn" areas.
- Prepare RCW cavity trees prior to prescribed burning operations
- All cavity trees in these areas will be checked immediately following any prescribed fire to assess damage and to determine the need for replacement cavities.
- Eglin NRS would replace any cavity tree damaged by prescribed fire to the point it is unsuitable for nesting or roosting within 72 hours with a box insert. Roost checks would not be conducted since it would be undetermined which bird would have been using the tree anyway.
- Eglin NRS would conduct a roost check and visually inspect the cavity if during a night prescribed burn the fire burned up through the cavity.

Additionally, Eglin will follow these conservation measures to minimize potential impacts to RCWs:

- Maintain at least a two-year burn return interval around A-77, A-78, A-79, and B-7 to decrease fire intensity.
- Per AFI 32-7064, Eglin must ensure adequate personnel and resources are available for addressing mission started wildfires. Four BRAC fire positions are being hired to help address this requirement.
- All cavity trees in these areas will be checked immediately following a wildfire to assess damage and to determine the need for replacement cavities.

Eglin concluded in 2004 that habitat alteration due to wildfire was not likely to adversely affect RCW individuals or populations, with certain conservation measures in place. However, since that time, the risk of impacts to RCWs and cavity trees has increased due to the policy change that does not allow fire fighters within the restricted and no suppression areas during fires, so they cannot actively protect the RCW trees in the areas around many of the A&GG TAs. Additionally, it is anticipated that future surges in mission activities could increase the number of wildfires on the TAs and the corresponding number of fires moving off the ranges and into interstitial areas.

Multiple factors would likely reduce the number of trees killed, including a two-year prescribed fire return interval for the "restricted suppression areas," and the RCW cavity tree preparation associated with frequent prescribed burning in the A&GG area. However, even with implementation of conservation measures, the potential exists for harassment of individuals and potential loss of active and inactive RCW cavity trees and foraging habitat. Eglin NRS believes that A&GG activities may affect, and are LIKELY TO ADVERSELY AFFECT the RCW. Eglin will implement the conservation measures listed in Section 2.3 in order to minimize the negative effects of air and ground gunnery activities.

4.1.2 Reticulated Flatwoods Salamander

Direct Physical Impacts

Potential direct physical impacts to the reticulated flatwoods salamander include trampling or crushing during troop and vehicle movement, wildfire, and munitions strikes during air and/or ground live fire exercises. Ground activities as well as air-to-ground and ground-to-ground live fire would generally avoid surface waters, thereby decreasing the potential to impact salamander ponds. In addition, adult salamanders spend the great majority of time underground, decreasing the potential for contact with troops and vehicles. Munitions strikes and troop/vehicle interactions are possible but would be considered infrequent and would not likely result in population-level effects. USFWS guidelines establish a 450-meter (1,476-foot) buffer area from the wetland edge of confirmed breeding ponds (see Section 2.3, Conservation Measures), and ground-disturbing activities are restricted within this area. If salamander breeding activity becomes confirmed at additional ponds on or near the TAs, these restrictions would be applied to that pond as well. There would be NO EFFECT on the reticulated flatwoods salamander due to direct physical impacts.

Noise

Noise due to munitions use and human presence could disturb reticulated flatwoods salamanders and cause behavioral reactions including avoidance of an area and disruption of activities. The potential for noise impacts may be somewhat less than that of most other species included in this BA due to differing hearing ability and mechanisms. Salamanders lack an external ear and have a poorly developed middle ear, although an inner ear is present and hearing occurs through other means such as detection of ground vibrations. In addition, salamanders spend a large majority of time underground, where aboveground noise would be attenuated. Although some disturbance would occasionally occur, impacts would probably be infrequent and would not likely result in population-level effects. There would be NO EFFECT on the reticulated flatwoods salamander due to noise and other human disturbance.

Habitat Alteration

Wildfires originating on the TAs could move off the ranges and impact potential flatwoods salamander habitat. In general, fire can benefit salamander habitat by keeping woody vegetation at appropriate levels. However, prescribed burning under more controlled and monitored conditions is preferred for habitat maintenance, and prescribed fire conducted in accordance with recommended timber management practices is an action that is not likely to adversely affect flatwoods salamanders. Conversely, wildfire suppression activities and the associated use of heavy equipment in wetland areas may negatively affect the flatwoods salamander through modification of hydrology and vegetative damage. As a protective measure, flatwoods salamander ponds and buffers are included as part of the biologically sensitive areas shown on the limited suppression map (Figure 4-2); thus, plows are not used off of range roads for fire suppression except in extreme conditions within these sensitive areas. The likelihood is low that off-road fire suppression techniques would be necessary because none of these TAs is near the urban interface and there are a limited number of assets requiring fire protection near the salamander habitat. Additionally, the majority of the potential salamander habitat within the vicinity of these TAs is also RCW foraging habitat, so it is burned relatively frequently, thus

reducing the likelihood of catastrophic wildfires that would require damaging suppression methods. Fire crews are briefed on protection of flatwoods salamander habitat prior to and during the fire season. Habitat alteration is NOT LIKELY TO ADVERSELT AFFECT the reticulated flatwoods salamander.

4.1.3 Eastern Indigo Snake

Direct Physical Impacts

Individual eastern indigo snakes could be struck by bombs, missiles, rockets, and bullets expended on the TAs. However, given that munitions are expended during discreet, non-continuous events and are in many cases directed at specific targets, the likelihood of direct physical impacts is considered low. Troop and vehicle movement associated with tactical training and small arms use, although comparatively infrequent, presents the possibility of trampling or driving over indigo snakes. Most records of eastern indigo snake occurrence on Eglin are associated with vehicle strikes. Ground activities are typically conducted on established roads (paved or unpaved), and vehicles must remain on roads unless prior approval is obtained. This would decrease the potential for vehicle strikes, as indigo snakes would be more easily sighted and avoided on roads than in vegetated areas. Off-road troop movement on foot is generally not considered intensive. In addition, encounters with indigo snakes would be extremely rare given the scarcity of this species on Eglin, combined with the snake's ability to escape from potentially injurious situations. Also, if an indigo snake was encountered during activities, personnel would stop and allow the snake to move to safety before proceeding (see Section 2.3, Conservation Measures). Wildlife biologists would be notified immediately to document the individual. There would be NO EFFECT to the eastern indigo snake due to direct physical impacts.

Noise

Although snakes lack external ears, they are generally capable of conducting sounds via mechanoreceptors in the skin and possibly other parts of the body. Sound detection appears to be more sensitive in the lower frequencies. The behavioral response of eastern indigo snakes to gunnery-type noises is unknown. However, the rarity of indigo snakes on Eglin and the intermittent occurrence of gunnery missions suggest that impacts would be minimal. Although the snakes could occur anywhere on or near the TAs, they are strongly associated with underground gopher tortoise burrows. Occurrence in burrows would attenuate above-ground noise. Therefore, there would be NO EFFECT to the eastern indigo snake due to noise.

Habitat Alteration

Habitat alteration could occur due to wildfires or burrow collapse/damage. Potential eastern indigo snake habitat could be affected by wildfires started on the TAs. However, wildfires may result in a benefit to such habitat. Prescribed fire in Eglin's sandhills helps to maintain suitable habitat conditions for multiple species, including the indigo snake.

Indigo snakes are strongly associated with gopher tortoise burrows. Burrows could be crushed or otherwise damaged by air-to-ground and ground-to-ground ordnance, and troop and vehicle

movement. The probability of ordnance striking close enough to a burrow to cause damage or collapse is not quantified, but is considered low because projectiles are typically directed toward specific targets as opposed to random distribution on the TAs. Therefore, only burrows near targets would typically have significant potential to be affected. Vehicles have the potential to collapse burrows. However, because vehicles are primarily kept on established roads, the possibility of impacts is reduced and considered minimal. 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 incidental impacts would be less severe than those caused by ordnance and vehicles. In addition, troop movement off of established roads is relatively low in frequency and intensity.

Also, depending on the specific activity, a protected species survey may be conducted in the area prior to the event. Surveys would document the presence of sensitive species and would specify any mitigating actions. Gopher tortoise burrows would be marked for avoidance as necessary.

Therefore, habitat alteration is NOT LIKELY TO ADVERSELY AFFECT the eastern indigo snake.

4.2 OTHER SPECIES CONSIDERED

4.2.1 Gopher Tortoise

Gopher tortoise burrows could be crushed or otherwise damaged by air-to-ground and ground-to-ground ordnance, and troop and vehicle movement. Gopher tortoise burrows support other commensal species such as the federally listed eastern indigo snake. The probability of ordnance striking close enough to a burrow to cause damage or collapse is not quantified, but is considered low because projectiles are typically directed toward specific targets as opposed to random distribution on the TAs. Therefore, only burrows near targets would typically have the potential to be affected.

Vehicles have the potential to crush an individual tortoise or egg clutch and collapse burrows. However, because vehicles are primarily kept on established roads, the possibility of impacts is reduced and considered minimal. 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 incidental impacts would be less severe than those caused by ordnance and vehicles. In addition, troop movement off of established roads is relatively low in frequency and intensity. Also, depending on the specific activity, a gopher tortoise survey may be conducted in the area prior to the event. Surveys would document the presence of burrows as well as individual tortoises, and would specify any mitigating actions. Burrows would be marked for avoidance as necessary. Gopher tortoises found in affected areas may be relocated by Eglin NRS personnel as necessary in accordance with Florida Fish and Wildlife Conservation Commission guidelines.

Noise caused by ordnance use and vehicle/troop operations, as well as other factors associated with human presence, could disturb gopher tortoises on an intermittent, temporary basis. Startle reactions may occur, and individuals may avoid areas of frequent use. Noise impacts would be

decreased when tortoises are in their burrows, as above-ground sounds would be attenuated. No significant population-level impacts are anticipated from these activities.

The use of munitions and pyrotechnics increases the risk of wildfires. In general, fire is beneficial to gopher tortoise habitat, although prescribed fire under more controlled conditions is preferred. Mortality of individual tortoises due to fire is not considered an issue of concern by Eglin NRS. Wildfires are not likely to significantly impact gopher tortoises.

Overall impacts to the gopher tortoise resulting from air and ground gunnery activities would not be significant. Conservation Measures, described in Section 2.3, will further reduce the probability of negative impacts to the gopher tortoise.

4.2.2 Florida Bog Frog

Potential Florida bog frog habitat occurs primarily on and near A-78 and A-79 (Figure 3-1). Potential direct physical impacts to the bog frog include munitions strikes and trampling or crushing during troop and vehicle movement. Ground activities as well as air-to-ground and ground-to-ground fire would generally avoid surface waters, thereby decreasing the potential to impact streams supporting the bog frog. Munitions strikes and troop/vehicle interactions are possible but would be considered infrequent. As described in Section 2.3, Conservation Measures, ground-disturbing activities are restricted within 100 feet of bog frog streams (no off road driving, digging, vegetation cutting, or pyrotechnics/munitions use). Due to the relative infrequency of ground movement on the TAs and the protective measures in place, significant direct physical impacts to the Florida bog frog from air and ground gunnery activities are unlikely.

Generally, fire benefits bog frog habitat by controlling hardwood invasion of the boggy areas along stream habitats, although prescribed fire is preferred. Wildfires may be caused by munitions and pyrotechnics use. Wildfire suppression activities in riparian areas have the potential to negatively affect the Florida bog frog through modification of hydrology and vegetative damage. However, plows are not used off of range roads for fire line construction except in extreme conditions within riparian areas around bog frog streams. Any damage to streams and stream banks would be repaired.

Overall, air and ground gunnery activities would not significantly impact the Florida bog frog. Conservation Measures, described in Section 2.3, will further reduce the probability of negative impacts to the species.

4.2.3 Florida Pine Snake

The Florida pine snake could potentially occur on any of the TAs. Similar to the indigo snake, the pine snake may occupy gopher tortoise burrows, but may also be found in rodent burrows. Individual snakes could be struck by munitions expended on the TAs. However, given that munitions are expended during discreet, non-continuous events and are in many cases directed at specific targets, the likelihood of direct physical impacts is considered low. Pine snakes could

also be trampled or crushed during troop and vehicle movement associated with tactical training and small arms use. Ground activities are typically conducted on established roads (paved or unpaved), and vehicles must remain on roads unless prior approval is obtained. This could decrease the potential for vehicle strikes, as snakes would be more easily sighted and avoided on roads than in vegetated areas. Off-road troop movement on foot is generally not considered intensive. In addition, snakes may avoid or flee areas supporting human presence and activity.

Although snakes lack external ears, they are generally capable of conducting sounds via mechanoreceptors in the skin and possibly other parts of the body. Sound detection appears to be more sensitive in the lower frequencies. The behavioral response of the pine snake to gunnery-type noises is unknown. Although individual snakes may be disturbed by nose, and potentially important behaviors could be disrupted, significant population-level effects are not anticipated. Snakes inhabiting burrows during air and ground gunnery activities would be exposed to less intense noise levels due to attenuation.

In general, fire is beneficial to pine snake habitat, although prescribed fires under more controlled conditions are preferred. Fire in Eglin's sandhills helps to maintain suitable habitat conditions for multiple species, including the pine snake. Although individual Florida pine snakes have the potential to be crushed, trampled, or disturbed during air and ground gunnery activities, overall population-level impacts are not expected to be significant.

4.2.4 Florida Burrowing Owl

The Florida burrowing owl has a confirmed population on B-70 (not included in the Air and Ground Gunnery REA), but this species could occur anywhere suitable habitat is present and has been visually documented on multiple TAs across the Eglin Range. Owl burrows could be crushed or damaged by air-to-ground and ground-to-ground ordnance, and troop and vehicle movement. The probability of ordnance striking close enough to a burrow to cause damage or collapse is not quantified, but is considered low because projectiles are typically directed toward specific targets as opposed to random distribution on the TAs. Therefore, only burrows near targets would typically have the potential to be affected.

Vehicles have the potential to crush an individual owl and collapse burrows. However, because vehicles are primarily kept on established roads, the possibility of impacts is reduced and considered minimal. 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 incidental impacts would be less severe than those caused by ordnance and vehicles. In addition, troop movement off of established roads is relatively low in frequency and intensity. Also, depending on the specific activity, a burrowing owl survey may be conducted prior to the event. Surveys would document the presence of burrows and would specify any mitigating actions. Burrows would be marked for avoidance as necessary.

Gunnery noise may temporarily disturb burrowing owls, and nesting efforts could also be disrupted. In addition to gunnery noise, owls could be disturbed by human presence and activity, including vehicle use. Ground movements may disturb birds on the TAs on an intermittent,

temporary basis. Startle or flushing reactions may occur, and individuals may avoid areas of frequent use. However, ground movement is minimal in these test areas due to UXO contamination. Movement between TAs is infrequent and involves low to moderate personnel movements. Noise impacts would be decreased when owls are in their burrows, as above-ground sounds would be attenuated. Given the history of ongoing operations on the TAs, and the fact that burrowing owls continue to occur on the TAs, it appears that these birds have become habituated to noise at least to some extent. Suitable habitat appears to outweigh any negative influences associated with noise.

Wildfires caused by air and ground gunnery activities could be beneficial to burrowing owl habitat, although fires ignited under hot or dry conditions could result in negative effects. Wildfire suppression activities have the potential to impact individual burrowing owls and their burrows through temporary habitat disturbance and incidental contact with equipment. While it is possible that vehicles could crush an owlet, burrow or egg clutch, this risk is minimized by the fact that vehicle activity will be limited for the most part to established roads and trails. In the event that a burrow is spotted, personnel will avoid the burrow.

Overall, with the implementation of the Conservation Measures outlined in Section 2.3, air and ground gunnery activities would not significantly impact the Florida burrowing owl.

4.2.5 Southeastern American Kestrel

The southeastern American kestrel is relatively common on Eglin AFB, frequently utilizing the cleared TAs (tree line, utility poles, etc.) as foraging areas and nesting in longleaf pine cavities. These birds spend little time on the ground and are therefore unlikely to be physically impacted by troop or vehicle movements. Bombs, missiles, rockets, and bullets expended on the TAs are in many cases directed toward specific targets and are not expected to substantially impact foraging birds. Random munitions strikes are possible but would be considered infrequent and would not likely result in population-level effects.

Noise and other aspects of human presence may disturb kestrels. Noise is associated with airborne gunnery and ground-based activities. Noise can cause numerous responses in wildlife species such as the kestrel. Effects can range from behavioral reactions such as startle/flushing response, cessation of normal activities, and avoidance of an area, to long-term effects on reproduction such as decreased nesting success. Biochemical reactions can include the production of stress hormones. Human presence and general activities may deter birds from an area on a short- or long-term basis.

Gunnery noise may temporarily disturb individual kestrels, and foraging individuals may avoid areas where disturbance is occurring. Nesting efforts could also be disrupted. However, relatively large areas of similar habitat are available on and in proximity to Eglin. Given the history of ongoing military operations on the TAs, and the fact that kestrels continue to occupy habitats on the base, it appears that these birds have become habituated to noise at least to some extent.

In addition to gunnery noise, kestrels could be disturbed by human presence and associated disturbance, including vehicle use. Ground movements may disturb birds on the TAs on an intermittent, temporary basis. Startle or flushing reactions may occur, and individuals may avoid areas of frequent use. However, ground movement is minimal in these test areas due to UXO contamination. Troops generally stay within the confines of the TAs in permitted times and places. Movement between TAs is infrequent and involves low to moderate personnel movements.

Wildfires could impact kestrel habitat by damaging nesting cavity trees or foraging perches. The potential for impacts is increased by the limitation of fire suppression activities in areas with UXO concerns. Wildfire impacts will probably be somewhat similar to those described for the RCW, although the severity is less because kestrels are not as directly dependent upon the pine trees for prey items. Conservation measures related to the RCW (Section 2.3) would incidentally benefit kestrels as well.

Conclusion

5. CONCLUSION

Based on analysis of potential direct physical impacts, noise, and habitat impacts associated with the Proposed Action, the RCW is the only protected species that is likely to be adversely affected by air and ground gunnery activities. Even with the implementation of conservation measures, negative impacts are possible for the RCW.

The NRS will notify the USFWS immediately if any of the actions considered in this Biological Assessment are modified or if additional information on listed species becomes available, as a reinitiation of consultation may be required. If impacts to listed species occur beyond what has been considered in this assessment, all operations will cease, and the USFWS will be notified. Any modifications or conditions resulting from consultation with the USFWS will be implemented prior to commencement of activities.

Conclusion

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List of Preparers

6. LIST OF PREPARERS

Name/Title	Project Role	Experience
Nunley, J. Michael SAIC Marine Scientist Environmental Scientist M.S. Marine Ecology B.A. Biology	Author, Project Manager	14 years environmental science
Combs, Rick SAIC M.S. Biology B.S. Biology B.S. Business Administration	Author	10 years environmental science
Hiers, Stephanie SAIC Environmental Scientist M.S. Conservation Ecology B.S. Biology	Author	13 years environmental science
Knight, Kelly SAIC Environmental Scientist M.S. Biology/Coastal Zone B.S. Biology	Author, GIS	9 years environmental science

List of Preparers

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U.S. Air Force (USAF), 2004b. Informal U.S. Fish and Wildlife Service Endangered Species Act Section Seven Consultation for the Air-To-Ground Gunnery: A-77, A-78, A-79, and B-7 Programmatic Biological Assessment. August 2004.

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References

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IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Field Office
1601 Balboa Avenue
Panama City, FL 32405-3721
Tel: (850) 769-0552
Fax: (850) 763-2177

December 7, 2012

Mr. Thomas L. Chavers
Chief, Eglin Natural Resources Section
501 De Leon Street, Suite 101
Eglin AFB, FL 32542-5133

Attn: Mr. Bruce Hagedorn

Re: USFWS log #04EF3000-2012-I-0295
Date Started: August 1, 2012
Action Agency: Eglin Air Force Base
Project Title: Eglin-Air and Ground Gunnery (A&GG); Training and Test Areas A-73, 77, 78, 79, B-7, and 75.
Location: Eglin Air Force Base
Ecosystem: Northeast Gulf
Counties: Okaloosa, Walton, and Santa Rosa, Florida

Dear Mr. Chavers:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your letter dated August 1, 2012, and biological assessment (BA) dated July 2012, requesting initiation of formal consultation in accordance with Section 7 of the Endangered Species Action of 1973, as amended (16 U.S.C. 1531 et seq.) and the Sikes Act of 1960, as amended (16 U.S.C. 670a et seq.). We received your letter and BA on August 6, 2012 relative to impacts identified with Air and Ground Gunnery (A&GG) Range actions.

The Proposed Action is for the Air Force to establish an authorized level of activity for Test Areas (TAs) A-73, A-77, A-78, A-79, B-7, and B-75, based on an anticipated maximum usage. The ranges are already cleared for live and simulated fire, missile impact, aerial bombardment, and aerial strafing, though all activities are not authorized at all ranges. The Proposed Action provides for additional surge capability in the test and or training mission (including an overall increase in munitions use), addition of weapons systems (e.g. F-35, CV-22, remotely piloted vehicles, new armored vehicles), and additional live small arms test and training at TA A-73. The Air Force will periodically require a surge in mission activity in order to maintain operational readiness and this proposed action will accommodate that need.

Based on incorporation of Conservation Measures into the project plans, Eglin AFB's Natural Resource Section's (NRS) determinations of effect to the protected species and the Service's

responses per action are summarized within Table 1 below.

Species	Scientific Name	Action	NRS Effects Determination	FWS Response
Red-cockaded woodpecker (RCW)	*Picoides borealis*	Direct Physical Impact	No effect	Concur
		Noise Impacts	Not likely to adversely affect	Concur
		Habitat Alteration	**May affect, likely to adversely affect**	Concur
Reticulated flatwoods salamander	*Ambystoma bishop*	Direct Physical Impact	No effect	Concur
		Noise Impacts	No effect	Concur
		Habitat Alteration	Not likely to adversely affect	Concur
Eastern indigo snake	*Drymarchon couperi*	Direct Physical Impact	No effect	Concur
		Noise Impacts	No effect	Concur
		Habitat Alteration	Not likely to adversely affect	Concur

In summary, we concur with the BA's determination of no effect or not likely to adversely affect for all species except the red-cockaded woodpecker (*Picoides borealis*) (RCW). NRS has determined that impacts by A&GG wildfires may affect (MA) and are likely to adversely affect (LAA) the red-cockaded woodpecker (RCW) (*Picoides borealis*). The Service concurs with your determination of MA LAA for the RCW and its habitat. We have assigned log number FWS 04EF3000-2012-I-0295 to this formal consultation.

All the needed information to complete the consultation has been received by the Service. Therefore, all information required of you to initiate consultation has been provided and is adequate to prepare the biological opinion. Section 7 allows the Service up to 90 days to conclude formal consultation with your agency, and an additional 45 days to prepare our biological opinion (unless we mutually agree to an extension). In consult with Mr. Bruce Hagedorn, NRS staff, we jointly decided that it would be most efficient for both the Service and Eglin's NRS staff to develop a programmatic biological opinion (BO) for all actions within Eglin's NRS purview that MA LAA the RCW. A draft RCW programmatic biological opinion is expected to be finalized in early 2013.

The Endangered Species Act requires that after initiation of formal consultation, the federal action agency make no irreversible or irretrievable commitment of resources that limits future options. This practice ensures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

If you have any questions or concerns about this consultation, please contact Ms. Patty Kelly at ext. 228

Sincerely,

Dr. Jon Hemming
Deputy Project Leader
Ecological Services

Location: Panama City FO:Pkelly/LLehnhoff.lt:12-07-2012:850-769-0552x228:Server/Miltary/Eglin/AirGroundGunneryBA /20121207 Formal_PCFOFWS_to_NRS_ltr.doc.

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APPENDIX I

PUBLIC AND AGENCY OUTREACH

FLORIDA STATE CLEARINGHOUSE COMMENTS

Florida Fish and Wildlife Conservation Commission

Commissioners
Kenneth W. Wright
Chairman
Winter Park
Bo Rivard
Panama City
Ronald M. Bergeron
Fort Lauderdale
Richard A. Corbett
Tampa
Aliese P. "Liesa" Priddy
Immokalee
Charles W. Roberts III
Tallahassee
Brian S. Yablonski
Tallahassee

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Assistant Executive Director
Karen Ventimiglia
Chief of Staff

Office of the Executive Director
Nick Wiley
Executive Director

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(800) 955-8770 (V)

MyFWC.com

June 13, 2013

Ms. Lauren P. Milligan
Environmental Manager
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, MS 47
Tallahassee, FL 32399-3000
Lauren.Milligan@dep.state.fl.us

Re: SAI #FL201305136586C, Department of the Air Force, Draft Final Environmental Assessment, Air and Ground Gunnery: Test Areas A-73, A-77, A-78, A-79, B-7 and B-75, Eglin Air Force Base, Okaloosa and Santa Rosa Counties, Florida

Dear Ms. Milligan:

Florida Fish and Wildlife Conservation Commission (FWC) staff has reviewed the draft Final Environmental Assessment (DEA), and provides the following comments and recommendations for your consideration, in accordance with the Coastal Zone Management Act, Florida's Coastal Management Program.

The proposed action within the Air and Ground Gunnery Test Areas at Eglin AFB is to establish an authorized level of activity based on an anticipated maximum usage. The analysis of the increased mission activities include:

- air-mission activities (e.g., dispensing munitions such as bombs, missiles, and small arms, as well as countermeasures such as chaff and flares); and
- ground-training mission (e.g., crossing terrain on foot, with all-terrain vehicles [ATVs], military vehicles, ground combat simulations, and live small arms use).

Comments and Recommendations

Table 3-9, Section 3.4 of the DEA identifies both federal- and state-listed species that may occur within the proposed project areas. Section 5.2 contains proposed management actions to minimize impacts to many of the state- and federally listed species that could be affected by the proposed action. The following are specific comments and recommendations regarding state-listed species:

Gopher Tortoises

Gopher tortoises and their commensals are known to occur within the test areas, as indicated in Section 3.4 of the DEA and shown in Figure 3-5. FWC recommends the Final EA reference the FWC's Gopher Tortoise Permitting Guidelines (Revised April 2013) (http://myfwc.com/license/wildlife/gopher-tortoise-permits/) for survey methodology and specific permitting guidance prior to any development activity. Specific guidance in the permitting guidelines includes methods for avoiding permitting as well as options and state requirements for minimizing, mitigating, and permitting

potential impacts of the proposed activities. This website also provides the contact information for the gopher tortoise conservation biologist in the area.

Eglin has indicated in Section 5.2 the management actions for protection of the gopher tortoise and means to minimize impacts. These will be sufficient to address our concerns.

Burrowing Owls

Figure 3-5 indicates the locations of various species sensitive to disturbance, including burrowing owls. Test area B-70 appears to have significant numbers of burrowing owl observations and would have the greatest impact level from the proposed activities. Eglin has indicated in Section 5.2 the management actions for protection of the burrowing owl and means to minimize impacts during ground operations and ground disturbing missions. These should be sufficient to address our concerns.

Additional Species

Several additional state-listed species are known to occur in nearby portions of Eglin, and therefore may potentially occur within or occasionally use the test areas, including the Pine Barrens treefrog (*Hyla andersonii,* FL- Species of Special Concern (SSC)), Florida bog frog (*Lithobates okaloosae,* FL-SSC), gopher frog (*Lithobates capito,* FL-SSC), alligator snapping turtle (*Macrochelys temminckii,* CL-SSC), and Florida pine snake (*Pituophis melanoleucus,* FL-SSC). To lessen the potential or severity of adverse impacts to the treefrog, bog frog, and snapping turtle, the measures provided in Section 5.2 of the DEA should be followed. Regarding the gopher frog, FWC's Gopher Tortoise Permitting Guidelines (http://myfwc.com/license/wildlife/gopher-tortoise-permits/) should be followed. Lastly, Air Force personnel should be advised not to harm or molest any pine snakes that they may encounter while conducting operations on the test sites.

We concur that the proposed project is consistent with our authorities under Chapter 379 Florida Statutes. If you need any further assistance, please do not hesitate to contact Jane Chabre either by phone at (850) 410-5367 or at FWCConservationPlanningServices@MyFWC.com. If you have specific technical questions regarding the content of this letter, please contact Theodore Hoehn at (850) 488-8792 or by email at ted.hoehn@myfwc.com.

Sincerely,

Bonita Gorham
Land Use Planning Program Administrator
Office of Conservation Planning Services

bg/th
Eglin AFB Air and Ground Gunnery_17609_061313
ENV 1-3-2
cc: Mr. Brad Boykin, SAIC, boykinb@saic.com

RESPONSE TO COMMENTS FOR DRAFT-FINAL RANGE ENVIRONMENTAL ASSESSMENT FOR THE AIR AND GROUND GUNNERY: TEST AREAS A-73, A-77, A-78, A-79, B-7, AND B-75 AT EGLIN AIR FORCE BASE, FLORIDA

A public notice was published in the *Northwest Florida Daily News* on May 14, 2013 to disclose completion of the Draft-Final Range EA, and Draft FONSI, selection of the preferred alternative, and request for comments during the 15-day pre-decisional comment period.

The 15-day comment period ended on May 28th, with the comments required to this office not later than May 31st, 2013. No comments were received during this period.

//Signed//
Mike Spaits
Public Information Specialist

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