

**EGLIN AIR FORCE BASE
Florida**

SANTA ROSA ISLAND

**FINAL RANGE ENVIRONMENTAL
ASSESSMENT, REVISION 1**



MARCH 2012

Report Documentation Page

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FINAL FINDING OF NO SIGNIFICANT IMPACT
FOR
SANTA ROSA ISLAND RANGE ENVIRONMENTAL ASSESSMENT ON
EGLIN AIR FORCE BASE, FLORIDA
RCS 11-630 Revision 1, 2012

This finding, and the analysis upon 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 Title 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 989.

The Air Force has conducted a Range Environmental Assessment (REA) of the potential environmental consequences associated with testing and training activities at Santa Rosa Island (SRI) on Eglin Air Force Base (AFB), Florida. The March 2012 REA is hereby incorporated by reference into this finding.

PURPOSE AND NEED (Section 1.2, pages 1-3 to 1-4)

The purpose and need of the proposed action is twofold:

1. Purpose: to quickly and efficiently process new programs requesting access to SRI 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 re-evaluating 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 of mission activities on SRI in the 2005 *Santa Rosa Island Mission Utilization Plan Final Programmatic Environmental Assessment* (PEA) (U.S. Air Force, 2005). Some of Eglin AFB's mission activities have changed since the original environmental analysis was done, requiring new environmental analysis to be performed. Currently, when approval for a new mission is requested, it may be categorically excluded from additional environmental analysis if it is similar in action to a mission that has been previously assessed and the assessment resulted in a finding of no significant environmental impact. The categorical exclusion (CATEX) designation is in accordance with NEPA and Air Force regulations (CEQ 32 CFR 989.13 and Air Force Instruction [AFI] 32-7061).

Since some of these ongoing mission activities were originally assessed, and also since some of the mission activities used for CATEX purposes were assessed, changes have occurred at Eglin

AFB that could affect environmental analysis. The types of changes resulting in the need to reevaluate the NEPA analysis individually and cumulatively include the following:

- Additional species have been given federal and state protected status.
- Critical habitat for federally listed species has expanded.
- Species not previously known to exist at Eglin AFB have been discovered.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin AFB's borders has increased.
- Air Force regulations have changed.
- Military missions and weapons systems have evolved.

The analysis discussed in this report allows for a cumulative look at the impact on SRI receptors from all mission activities. By implementing an authorized level of activity, range management will be streamlined and cumulative environmental impacts will be more fully considered.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Proposed Action (REA Section 1.2, page 1-1)

The Proposed Action is for the 46th Test Wing to establish a new authorized level of activity for SRI that is based on an anticipated maximum usage. Demonstrating that the individual and cumulative effects of this usage level would not have significant environmental impacts is the method for establishing the maximum threshold baseline, identified as the Range Environmental Impact Analysis Process Baseline. The environmental analysis is accomplished by evaluating the effects that the military mission activities and expendables have on Eglin AFB's natural, physical, and cultural environment.

The No Action Alternative and Alternative 1 are not expected to be sufficient to account for the expected growth of testing and training activities at Eglin AFB over the next 10 years. Therefore, Alternative 2 was selected as the Preferred Alternative to adequately cover the environmental analysis needed to support potential increased testing and training requirements as they occur.

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

This alternative is defined as authorizing the activities approved in the 2005 *Santa Rosa Island Mission Utilization Plan Programmatic Environmental Assessment* (PEA). This alternative would authorize types of activities without quantification of expendables associated with the activities.

Alternative 1 (REA Section 2.2.2, page 2-3)

Alternative 1 would authorize the current level of activity, including the associated number of expendables, plus foreseeable future activities. The current level of activity is defined as the maximum annual expenditure for each type of expendable reported from fiscal year 1997

through 2008; this approach accounts for periods of low or no activity for a given mission. Thus, this alternative would establish a quantity of expendables associated with baseline activities described in the Preferred Alternative of the 2005 PEA. Additionally, Alternative 1 includes revisions to some mission locations and the number of areas to be used for particular activities. These revisions include a reduction in the number of Landing Craft Air Cushion (LCAC) crossover corridors, establishment of a Close Quarters Battle (CQB) training area, establishment of a dedicated training area, and increases in the number of boat landing sites and helicopter landing zones. These areas have been established through coordination with Eglin AFB Natural Resources Section (NRS) and Cultural Resources Section (CRS) to avoid or minimize, to the greatest extent possible, potential impacts to sensitive areas.

Alternative 2 (REA Section 2.2.3, page 2-6)

This alternative is defined as authorizing the level of activity as described under Alternative 1, plus an increase in mission activity (testing and training) to achieve an optimal usage level. The optimum usage level was chosen as a likely maximum surge increase in military testing and training during a national defense contingency. This alternative would be implemented using management actions identified in the REA.

Preferred Alternative (REA Section 2.4, page 2-10)

The Preferred Alternative is Alternative 2, which allows an increase in SRI operations over the current level of activity. Implementation of management actions will allow a surge in test and training activities while minimizing impacts to environmental and natural resources.

ENVIRONMENTAL IMPACTS

Analysis was conducted to determine the potential impacts to the human and natural environment resulting from the No Action Alternative, Alternative 1, and Alternative 2. No significant impacts to resources have been identified, provided the management actions summarized in Section 2.5 of the REA (pages 2-11 to 2-19) are implemented.

Chemical Materials/Debris (REA Section 4.1, pages 4-1 to 4-10) - Liquid, solid, and gaseous substances could be released to the environment as a result of mission activities. Transport, storage, use, and disposal of hazardous materials and waste would be coordinated with Eglin's Environmental Compliance Branch, Pollution Prevention Section (96 CEG/CEVCP) and disposed of appropriately according to regulations and AACI 32-7003, *Hazardous Waste Management Plan*. AFI 32-7086 Supplement I, *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, hazardous materials, or hazardous waste would be reported.

Quantities of non-hazardous chemicals, such as metals, combustion products, and dyes, released into the environment would increase under the Preferred Alternative. These types of materials would be released during munitions use, missile launches, ground maneuvers, air operations, surf zone testing, small boat obscurant testing, and pyrotechnics use. However, no significant impacts to soil, water, or biota are expected due to these activities under any of the alternatives.

Debris includes items such as cartridges, canisters, refuse, shrapnel, missile debris, and flare chutes. The quantity of such items could increase under the No Action Alternative compared to baseline activities. Much of the debris generated during troop movements and gunnery and other missions would be disposed of according to AACI 32-7003 and AFI 32-7086 Supplement I. The likelihood of humans or biota being struck by falling debris from early missile flight termination is considered remote. No significant impacts due to debris are expected under any of the alternatives.

Several closed Environmental Restoration Program sites, Areas of Concern, and Points of Interest (POI)s occur on SRI; however, there is an Internal Land Use Control (LUC) on POI-405. POI-405 consists of three separate areas located in the proposed testing and training area at A-15. The controls restrict any soil disturbance in the three areas. The southernmost area of POI-405 is partially covered by an asphalt pad. The uncovered part remains under a soil disturbance restriction for aerial or water crafts. The remaining two areas will be marked with sign in the near future. Adherence to LUCs and coordination with Eglin AFB's Environmental Restoration Section would be required for all testing and training exercises. Therefore, potentially hazardous materials would not come into contact with mission personnel or be introduced into wetlands or marine waters. If mission personnel should encounter soil that is discolored or has a chemical odor or unusual debris during any ground training operations, the personnel should immediately notify the Environmental Restoration Section.

Soils (REA Section 4.2, pages 4-11 to 4-15) - No significant impacts to soils are expected under any of the alternatives. Ground testing and training activities may impact dune vegetation, induce erosion, displace sand, cause temporary changes to beach contours, and cause compaction and rutting. However, avoidance of the primary dune line and dunes over five feet in height, use of landing zones, and monitoring/management practices would decrease such potential. Compaction, rutting, and changes in contours would be temporary. LCAC crossings would occur only at designated areas. Surf zone tests involving live detonations will require a separate environmental analysis and routing through the Air Force 813 process.

Water Resources (REA Section 4.3, pages 4-15 to 4-23) - No significant impacts to water resources are expected under any of the alternatives. Increased turbidity and introduction of graywater and metals to surface and subsurface waters and wetlands could occur due to ground training, gun, flare, and obscurant use, and amphibious assaults. However, the potential for impacts is decreased by appropriate graywater disposal, provision of portable latrines, avoidance of vehicle movement and digging in wetlands, and general confinement of vehicles to designated roads. Only limited foot traffic could potentially occur in wetlands. Metal residues are not expected to accumulate at concentrations that would significantly degrade water resources. Turbidity and other known effects associated with amphibious assaults would be temporary. Post-mission monitoring would be needed to assess turbidity changes caused by Amphibious Assault Vehicle (AAV) use. Surf zone testing and missions requiring use of vehicles in wetlands would require a separate analysis and approval through the Air Force 813 process. None of the proposed actions involves construction in the floodplain; therefore, there would be no impacts to floodplains.

Biological Resources (REA Section 4.4, pages 4-23 to 4-58) – Biological resources could be affected by noise, direct physical impacts, and habitat alteration. Noise produced by aircraft and

LCAC operations, gunnery and missile missions, amphibious craft operation, and surf zone missions may startle or temporarily displace wildlife. However, noise effects to nesting sea turtles or shorebirds, or the Santa Rosa beach mouse, would not be significant, particularly if nesting seasons are avoided. Management requirements identified in Section 2.5 would decrease the likelihood and severity of noise impacts to sensitive species.

Direct physical impacts could result from contact with wildlife or flora due to vehicle collision/foot trampling, boat collisions, beachfront activities, shrapnel or direct hits, and activities associated with amphibious assaults. However, mobile species would generally be able to avoid contact, and management requirements would decrease the potential for impacts to eggs, nests, vegetation, and smaller species such as the beach mouse.

Sensitive habitats on SRI include Coastal Protection Areas, dune communities, sea turtle nesting habitat, sea bird and shorebird nesting and foraging areas (including piping plover critical habitat), essential fish habitat, and Gulf sturgeon habitat. With the implementation of management requirements, impacts to these habitats would not be significant due to physical disturbance, fire, introduction of non-native species, or artificial lighting.

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 NRS has conducted an Endangered Species Act (ESA) Section 7 consultation with the U.S. Fish and Wildlife Service (REA Appendix F).

Cultural Resources (REA Section 4.5, pages 4-57 to 4-58) - No adverse effects to cultural resources would occur under any of the alternatives. The missions included in all alternatives have been coordinated with Eglin AFB CRS to avoid potential impacts. However, further coordination would be required prior to any activities outside of currently approved test and training areas or above levels currently approved.

Air Quality (REA Section 4.6, page 4-58 to 4-59) - Impacts to air quality are not expected to be adverse under any of the alternatives. Even with increased munitions use the emissions would not be substantial enough to cause levels to be greater than the National Ambient Air Quality Standards or greater than 10 percent of Santa Rosa or Okaloosa County's baseline levels.

Noise (REA Section 4.7, pages 4-59 to 4-65) – No adverse impacts are expected to residential areas or the public due to noise produced by aircraft, LCAC, detonations, gunnery, and missiles. Helicopter operations would not expose the public to noise greater than 95 dBA Sound Exposure Level (ASEL). Flights associated with the Open-Air Hardware-in-the-Loop (OA-HITL) would only potentially impact residential areas if conducted in a north-south orientation; operational constraints may be required in such a case. Maximum LCAC noise levels fall below ASEL at distances more than 400 feet. Test Area A-15 would be closed to the public during missile launches, so that civilians would not be exposed to harmful noise levels. Public property is well outside the noise-related safety boundary for detonations and gunnery activities.

Safety and Restricted Access (REA Section 4.8, pages 4-65 to 4-69) – There would be no adverse effects to safety under any of the alternatives. Standard safety procedures require every practical effort to keep designated areas clear of all nonparticipating vehicles and personnel.

Safety footprints are established using munitions system science, computer modeling, and best management practices, and typically include a buffer zone. Policies and procedures are also in place to ensure the safety of Eglin AFB personnel during missions. Procedures are in place to minimize the risk from unexploded ordnance to Eglin personnel and the public.

Land Use and Recreation (REA Section 4.9, pages 4-69 to 4-70) - There would be no adverse effects to land use and recreation under any of the alternatives. Land use would not change. Eglin property that is open to the public for recreation could be closed or have restricted access during testing and training missions. However, these closures would be temporary, lasting only for duration of the activity, and other similar areas would usually be available for recreational use.

Socioeconomic Resources (REA Section 4.10, pages 4-70 to 4-71) - There would be no adverse effects to socioeconomic resources under any of the alternatives. Effects to recreational fishing would not be significant. Neither Okaloosa nor Santa Rosa County exceeds the state of Florida or the community of comparison percentage of minority and low-income persons. There are no school or childcare facilities on SRI.

PUBLIC NOTICE

A public notice was published in the *Northwest Florida Daily News* inviting the public to review and comment upon the REA and Draft Finding of No Significant Impact. The public comment period closed on August 30, 2011.

PERMITS (REA Section 1.6, page 1-12)

Future testing and training activities will require an amendment letter to the U.S. Fish and Wildlife Service pertaining to the existing Biological Assessment and Biological Opinion under Section 7 of the Endangered Species Act. The amendment letter will describe potential impacts to federally listed species and establish appropriate avoidance and minimization measures, as well as terms and conditions, to minimize impacts to threatened and endangered species.

Some components of this action would take place within or otherwise may affect the jurisdictional concerns of the Florida Department of Environmental Protection and will, therefore, require a consistency determination with respect to Florida's Coastal Zone Management Plan under the federal Coastal Zone Management Act (**Error! Reference source not found.**).

MANAGEMENT ACTIONS (REA Section 2.5, pages 2-11 to 2-20)

This REA was prepared with consideration that the following management requirements would be employed for all SRI missions. The proponents are responsible for ensuring these management activities are implemented.

General

- A restriction of a maximum of 140-decibel noise level leaving the Eglin Reservation boundary. An approximate calculation is 600 times the cube root of the NEW equals the distance in feet to the reservation boundary.
- No detonation can produce a seismic shock of more than 1 inch/sec peak particle velocity when reaching any structure. An approximate calculation is 60 times the square root of the NEW equals distance in feet to the structure.
- All inert weapons, which include practice bombs with spotting charge, on or near the surface are recovered, removed, and destroyed.
- Use of inert or target practice (TP) rounds of ordnance should always be considered.
- Live fire is restricted to designated areas. Blank ammunition use and pyrotechnics are permitted in designated areas. All activities are prohibited within cultural areas, piping plover critical habitat, and *Cladonia* sites. If an activity needs to be conducted within these areas, a separate consultation would be required.
- Follow regulations on debris and hazardous materials for cleanup. Cleanup of the test site debris and hazardous materials should be conducted according to regulations. Cleanup of debris is mandatory (as described in individual test directives).
- Wheeled vehicles would keep to existing trails/roads (described in individual test directives), unless there is special authority to use nonexisting trails/roads.
- All trenches must be filled immediately after use.
- The use of all pyrotechnic devices would be under the supervision of qualified personnel (described in individual test directives).
- Pyrotechnic devices that fail to ignite would not be disturbed, but they would be flagged. Explosive ordnance disposal (EOD) personnel would be notified for dud disposal (described in individual test directives).
- Coordinate planned use of pyrotechnics, explosives, or powerful munitions in the vicinity of restoration areas (sea turtle nesting/relocation sites) with NRS.
- Areas in which small arms with blank ammunition are used would be policed for debris. Spent cartridges would be collected for recycling (described in individual test directives).
- Debris from air-dropped live ordnance would not occur in the marine portion of the Region of Influence, since all live ordnance dropped into the Eglin Gulf Test and Training Range would normally be dropped beyond the 100-fathom line (approximately 30 miles from shore).
- Low-pressure sodium lights would be used, and all lights would be shielded from the beach and directed landward.
- Vehicle use in wetlands is prohibited. Troop maneuvers through wetlands should be avoided when possible.

- Troop maneuvers would be avoided on established dunes higher than 5 feet as well as vegetated areas. Such dunes are identified by a clear change in elevation that would cause a modification in the way a person is moving (for example, switching from a walking motion to more of a climbing motion). These dunes are also typically vegetated. Established dunes and vegetated areas are to be avoided because they function as habitat for protected species, providing food and shelter. Damage to the vegetation may not only decrease its value as habitat, but can expose the underlying sand to wind and storms that eventually modify the entire dune by erosion. Vehicles and equipment would not be allowed in dune habitat due to the similar potential for vegetation damage and subsequent wind and storm erosion.
- Sea turtle nests would be avoided. Early-morning surveys are conducted daily during turtle nesting season (01 May through 31 October), and any nests observed are marked. Nesting habitat is considered to extend from the mean high water line to 200 feet inland. Depending on the nature of a mission, sea turtle nests may be either left in place and avoided or relocated.
- Several shorebird species occur on SRI at various locations and times of the year. During missions, critical habitat for piping plover would be avoided, as well as nests of other species, to ensure nesting birds are not disturbed. Shorebird surveys and monitoring is routinely conducted by 96 CEG/CEVSN personnel during the nesting season (15 March to 31 August), but these surveys are not comprehensive and all nests may not be located. Additional surveys may be required for specific missions (mission proponents would be responsible for costs of additional surveys and posting nest locations). Shorebird nests with the potential to be damaged or disturbed by mission activities must be marked and avoided.
- Areas restricted due to the presence of cultural resources are not uniform throughout SRI but vary based on the specific location. Mission-specific requirements for activities occurring in restricted areas would be determined through coordination with 96 CEG/CEVSH.
- Any Native American or historic artifacts of any kind (e.g., arrowheads, pottery, bones, or old wreckage) encountered in the course of mission activity (or otherwise) should be left in place and reported as soon as possible to 96 CEG/CEVSH.
- Any mission action that may result in damage or substantial alteration to an existing structure (building, platform, tower, or other) is subject to the Environmental Impact Analysis Process and requires submission of an Air Force 813 form.

Advanced Littoral Reconnaissance Technologies (ALRT) Project Area

- All general measures detailed above would apply to the ALRT Project Area. During sea turtle and shorebird nesting seasons, surveys would be conducted daily by 96 CEG/CEVSN personnel and any nests located within the ALRT Project Area would be either marked and avoided or relocated to other areas.

Surf Zone Detonations

The Air Force has no plans to conduct surf zone detonations, and this activity is not part of this Environmental Assessment. However, the Navy has evaluated underwater detonations, including surf zone detonations at SRI. Required mitigations, identified in the resulting consultation and Biological Opinion and Letter Of Authorization (LOA), are summarized below.

- No detonations over 34 kilograms (75 pounds) shall be conducted in territorial waters, except the line charge detonations, which is a series of 5-lb charges over 107 meters (350 feet), and totaling up to 1,750 lbs.
- Activities shall be coordinated through the Environmental Help Desk to allow potential concentrations of detonations in a particular area over a short time to be identified and avoided.
- Visual and aerial surveys will be carried out as specified. Any protected species sighted will be reported.
- Line charge tests shall not be conducted during the nighttime.
- Additional mitigation measures shall be determined through the Naval Surface Warfare Center Panama City Division's environmental review process. Clearance zones must be determined based on the upper limit of different ranges of Net Explosive Weight (NEW).
- Monitoring and reporting measures shall be conducted according to requirements of the Navy's 2010 LOA.

Live Fire

Marine Mammals

- Live fire activities may require a separate Marine Mammal Protection Act consultation with National Oceanic and Atmospheric Administration (NOAA) Fisheries for impacts to marine mammals.
- Navy personnel would conduct LCAC live fire testing only under conditions of suitable visibility and sea state of 3 or less.
- Pre- and post-detonation monitoring would be conducted to survey the study area for marine mammals. If a marine mammal is sighted within the target or closely adjacent areas, the mission would be suspended until the area is clear.

Sea State Scale for Marine Mammal Observation

Scale Number	Sea Conditions
0	Flat, calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0 to 33% of surface; 0.3- to 0.6-m (1- to 2-foot) waves
3	Whitecaps on 33 to 50% of surface; 0.6- to 0.9-m (2- to 3-foot) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9-m (3-foot) waves

m = meters

Sea Turtles

- Live fire activities may require a separate Endangered Species Act (ESA) consultation with NOAA Fisheries for impacts to sea turtles.

- During the period from 01 May through 31 October, nighttime live fire missions would be minimized whenever possible.
- During the period from 01 May through 31 October, an observer must be present to identify signs of sea turtle activity.
- During the period from 01 May through 31 October, if a sea turtle or hatchling were observed on the beach during live fire activities, all firing would cease and troops would remain quiet, allowing the turtle to continue activities.
- During the period from 01 May through 31 October, live fire activities would preferentially occur at areas from which nests had been relocated or where no nests occur.
- During the period from 01 May through 31 October, live fire testing would be conducted only under conditions of suitable visibility and sea state.
- Frangible or nonlead munitions would be used when possible.

Shorebirds

- Live fire activities may require a separate ESA consultation with NOAA Fisheries for impacts to threatened or endangered shorebirds.
- Eglin NRS would conduct a pre-mission survey for nesting shorebirds. If any nests or colonies of shorebirds are found within the project area, the nest would be clearly marked and avoided. A reasonable buffer around the nest would be established to protect the nest from disturbance.
- If the buffer area around the nest is encroaching on the mission area and cannot be avoided, Eglin NRS would determine if the buffer can be reduced while ensuring no impacts to the nest would occur.
- During the period from mid-July to mid-May, live fire would be minimized near piping plover critical habitat.
- During the period from mid-July to mid-May (the winter foraging period), live fire buffer zones would be established around known piping plover critical habitat (e.g., 150 meters for frangible munitions, 2,000 meters for standard munitions).
- During the period from mid-July to mid-May (the winter foraging period), live fire would be directed toward the Gulf.

Surface-To-Air Missile Testing

- No nighttime test events would occur during sea turtle season (01 May through 31 October).
- Active nests would be marked, and any hatchlings disoriented by setup activities would be redirected toward the shoreline by Eglin NRS personnel or designee(s). Only persons on Eglin's sea turtle permit would be allowed to interact with sea turtle adults or hatchlings. Persons not included on the permit who encounter a sea turtle would contact Eglin NRS.
- Missile launches requiring nighttime setup would avoid sea turtle season if possible.

- During sea turtle season, low-pressure sodium vapor lighting and light shields would be used, and all unnecessary non-mission or safety lights would be turned off.

OA-HITL Tower Testing

- OA-HITL Tower night operations would be minimized during sea turtle nesting season (31 May through 31 August) when possible, especially during the peak nesting season for each sea turtle species (June and July).
- All lights on the tower, except aviation safety lights, will be turned off during sea turtle season (01 May through 31 October).

Personnel/Equipment Drops and Extractions

Sea Turtles

- Night personnel/equipment drops and extractions would be minimized during sea turtle season (from 01 May through 31 October), especially during the peak nesting season for each sea turtle species (June and July).
- From 01 May to 31 October, if surveys indicated a sea turtle nest within 200 feet of the primary extraction zone (PZ), another PZ would be used for that mission.

Shorebirds

- Eglin NRS would conduct a pre-mission survey for nesting shorebirds. If any nests or colonies of shorebirds are found within the project area, the nest would be clearly marked and avoided. A reasonable buffer around the nest would be established to protect the nest from disturbance.
- If the buffer area around the nest is encroaching on the mission area and cannot be avoided, Eglin NRS would determine if the buffer can be reduced while ensuring no impacts to the nest would occur.
- During the period from mid-July through mid-May, personnel/equipment drops and extractions would avoid known piping plover feeding areas.

Amphibious and Land-Based Activities

Sea Turtles

- During the period from 01 May through 31 August, if a sea turtle was observed on the beach during activities, personnel would remain quiet, allowing the turtle to continue her activities. All effort would be made not to obscure the turtle crawl or the nest area.
- During the period from 01 July through 31 October, if hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination. All effort would be made not to obscure the turtle crawls or the nest from where they emerged. Following completion of the activity, Eglin NRS would be contacted to verify the nest hatching.
- Nighttime amphibious and land-based activities on the beachfront would be minimized when possible during sea turtle season.

- Between 01 May and 31 October, when activities would be conducted on the beach during the night, one participant would be designated as an observer to be responsible for identifying signs of nesting or hatchling sea turtles. The observer would be responsible for ensuring that the training participants do not interfere with nesting sea turtles, impede hatchling sea turtles from emerging from the nest and crawling to the Gulf of Mexico, or obscure signs of sea turtle activity.
- No daytime (sunrise to sunset) mission-related beachfront activities would begin before completion of daily sea turtle nest survey and protection measures (nest marking or relocation) from 01 May to 31 October, unless approved through a Section 7 consultation.
- All known sea turtle nests would be marked and protected in accordance with established Eglin NRS protocol so that they could be easily identified by vehicle operators and troops. An additional 10-foot boundary would be marked around all nests occurring within the action area using reflective tape.
- During nighttime activities on the beach, an Eglin NRS observer would be stationed at each nest that was at or past incubation day 60. In the event that the nest hatched, the observer would be required to coordinate with the training/testing participants to ensure that the hatchling has unimpeded access to the water.
- For nighttime activities conducted on the beach between 01 May and 31 October, a one-time nesting survey would be conducted 2 hours prior to the start of the activity on the portion of the beach where the activity would occur. All nests located during surveys at night would be marked and protected (or relocated where approved) before the nighttime activity begins.
- Vehicle operators would remain alert at all times to the potential presence of sea turtles on the beach.
- Vehicle operators and troops would avoid marked sea turtle nests by at least 50 feet.
- Vehicles would traverse the beachfront as close to the waterline as possible and below the waterline when possible.
- Vehicular movement would remain at least 50 feet below the primary dune line.
- Fighting holes, trench systems, vehicle or equipment traps, artillery bunkers, etc., would be refilled and leveled after the activity is finished.
- To the extent practicable, vehicles and watercraft would be staged at water's edge. Whenever it is necessary to stage vehicles, watercraft, or set up equipment on the beachfront, silt screens would be installed around the base of the vehicles/craft/equipment and removed immediately following the operation. If a vehicle is left on the beach for more than one night, then a surveyor would be present to ensure that no turtles become entrapped.
- Eglin military and civilian personnel would be notified that, upon locating a sea turtle adult, hatchling, or egg that has been harmed or destroyed, contact must be made with the Eglin NRS.

- Daily morning sea turtle nest surveys would continue to be conducted between 1 May and 1 September in accordance with established index nesting beach survey and Eglin NRS protocol. Frequency of hatching and emerging success monitoring after 1 September would have to involve checking nests daily until the last nest has either hatched or reached 80 days incubation, at which time the nest would be evaluated per state protocol.
- All ruts deeper than 2 inches would be removed prior to sunset during sea turtle hatching season. All such ruts created during night operations would be removed immediately following operation completion.
- All holes or disturbed areas 2 feet or larger in diameter created as a result of vehicle or watercraft movement would be refilled immediately after the exercise is over.
- To the extent practicable, lighting associated with mission activities would be minimized through reduction, shielding, lowering, and appropriate placement of lights to prevent the glowing portion of any luminaries (including lamp, globe, or reflector) from being directly visible from anywhere on the beach.
- Personnel conducting work, including driving and/or operating equipment on or adjacent to the beach, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights and lighting on equipment at night.
- The size of vehicular movement corridors would be limited to the minimum necessary for the mission.
- *Sargassum* mats (weed lines) in the water would be avoided.
- Landing and movement corridors would be marked so as to be easily distinguished by the operators of amphibious landing vehicles/craft and other vehicles.
- Vehicles would remain on existing roads whenever possible.
- Sand dunes greater than 5 feet high and large sea oat clumps would be avoided by troop and vehicular traffic.
- LCACs would avoid vegetated areas to the greatest extent practical and would vary their paths within the designated crossover corridor.
- AAV and LCAC use within maneuver areas would be restricted to daylight hours during sea turtle season.
- LCAC and AAV maneuver/training activities would preferentially occur at areas from which nests have been relocated or where no nests occur. Coordination with Eglin NRS would be necessary to ensure that no nests are located within the maneuver area prior to AAV/LCAC use.
- A sea turtle nest relocation program would be implemented in areas where amphibious landings would be conducted between 01 May and 31 October. Eglin NRS must be notified at least 80 days prior to the action.

Shorebirds

- Eglin NRS would conduct a pre-mission survey for nesting shorebirds. If any nests or colonies of shorebirds are found within the project area, the nest would be clearly marked

and avoided. A reasonable buffer around the nest would be established to protect the nest from disturbance.

- If the buffer area around the nest is encroaching on the mission area and cannot be avoided, Eglin NRS would determine if the buffer can be reduced while ensuring no impacts to the nest would occur.
- Amphibious and land-based activities would be minimized during the winter foraging period near piping plover critical habitat.
- Amphibious and land-based activities would be restricted in piping plover critical habitat.

Perforate Lichen

- Troop and vehicle maneuvers through locations of the perforate lichen would be prohibited.
- Ground testing would be restricted near lichen populations.

Invasive Species

- Vehicle/equipment access in untreated areas with known invasive plant problems would be restricted.
- When possible, vehicles/equipment would be washed before transport onto the island.
- Vehicles would be kept on established roads when possible to avoid spread of invasive plants.
- Access corridors from roads to beach would be designated and periodically monitored for invasive species.
- Selection of native species for any new plantings on the island would be coordinated with the Eglin NRS.
- Sources of construction material and fill dirt would be screened to ensure that no invasive plants were present.
- Only certified weed-free vegetative material (e.g., hay bales, pine straw) would be used if brought in from off the island.

Small Boat Obscurant Testing

Marine Mammals

- Overflight of area by aircraft prior to testing to ascertain that marine mammals, large fish, and turtles are not in a critical area.

Sea Turtles

- Use of small boats at night would be minimized when possible during sea turtle nesting season, especially during the peak nesting season for each sea turtle species (June and July).
- *Sargassum* mats would be avoided.

- Testing would not be performed during turtle nesting season (01 May through 31 October). Nesting shorebirds would also benefit from this mitigation.
- Operational activities would only occur on concrete or asphalt hardstand areas.

Personnel

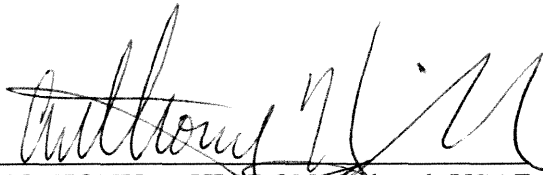
- No personnel would be allowed in safety exclusionary zone during testing.

Watercraft Traffic

- Shipwreck offshore of A-11 would be avoided.
- Shipwreck east of A-15A would be avoided.

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 decisions 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 989.



ANTHONY A. HIGDON, Colonel, USAF
Commander, 96th Civil Engineer Group

MAR 29 2012

Date

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SANTA ROSA ISLAND

**FINAL RANGE ENVIRONMENTAL
ASSESSMENT, REVISION 1**

Submitted to:

**96 CEG/CEVSP
Environmental Analysis Section
Eglin Air Force Base, Florida**

MARCH 2012



PRINTED ON RECYCLED PAPER

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

40 FTS	40th Flight Test Squadron
46 RANSS	46th Range Support Squadron
46 TS	46th Test Squadron
46 TW	46th Test Wing
46 TW/XPX	46th Test Wing, Plans Office
6 RTB	6th Ranger Training Battalion
780 TS	780th Test Squadron
96 CEG	96th Civil Engineer Group
96 CEG/CEVR	Eglin AFB Environmental Restoration Branch
96 CEG/CEVSH	Eglin AFB Cultural Resource Section
96 CEG/CEVSN	Eglin AFB Natural Resources Section
96 CEG/CEVSP	Eglin AFB Environmental Analysis Section
A/S	Air-to-Surface
AAC	Air Armament Center
AAC/SE	Safety Office
AADS	Advanced Air Dropped Sensors
AAV	Amphibious Assault Vehicle
AFB	Air Force Base
AFDTC	Air Force Development Test Center
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFPAM	Air Force Pamphlet
AGL	Above Ground Level
AGM	Air-to-Ground Missile
ALRT	Advanced Littoral Reconnaissance Technologies
ARG/MEU	Amphibious Ready Group/Marine Expeditionary Unit
Avg	Average
BHPO	Base Historic Preservation Office
BLS	Boat Landing Site
BRAC	Base Realignment and Closure
C4ISR	Command, Control, Communications, Computers, Intelligence, and Surveillance/Reconnaissance
CATEX	Categorical Exclusion
CDNL	C-weighted Day-Night Sound Level
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CHABA	National Academy of Sciences Committee on Hearing, Bioacoustics, and Biomechanics
CO	Carbon Monoxide
CQB	Close Quarters Battle
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	Decibels
dBA	A-weighted Decibels
dBC	C-weighted Decibels
dBP	P-weighted Decibels
DNL	Day-Night Average Sound Level
DNL_{mr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
DoD	Department of Defense
DODIC	Department of Defense Identification Code
DPI	Direct Physical Impact
EA	Environmental Assessment
EBD	Environmental Baseline Document
ECM	Electronic Countermeasures
EFH	Essential Fish Habitat

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

EGTTR	Eglin Gulf Test and Training Range
EIAP	Environmental Impact Analysis Process
EIS/OEIS	Environmental Impact Statement/Overseas Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
FY	Fiscal Year
GBU	Guided Bomb Unit
GIS	Geographic Information System
GOM	Gulf of Mexico
GPS	Global Positioning System
HE	High Explosive
HLZ	Helicopter Landing Zone
Hr	Hour
Hz	Hertz
INRMP	Integrated Natural Resources Management Plan
INS	Invasive Nonnative Species
IWR	Impaired Waters Rule
km	Kilometers
LCAC	Landing Craft Air Cushion
LDP	Legacy Debris Pit
L_{max}	Maximum Sound Level
LOA	Letter of Authorization
LUC	Land Use Control
LZ	Landing Zone
µg/m³	Micrograms per Cubic Meter
mg/kg	Milligrams per Kilogram
mm	Millimeter
MMRP	Military Munitions Response Program
MOA	Military Operating Area
MOAB	Massive Ordnance Air Blast
MSL	Mean Sea Level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEODS	Naval Explosive Ordnance Disposal School
NEPA	National Environmental Policy Act
NEW	Net Explosive Weight
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_x	Nitrogen Oxides
NRHP	National Register of Historic Places
NRS	Natural Resources Section
NSWC PCD	Naval Surface Warfare Center – Panama City Division

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

OA-HITL	Open-Air Hardware-in-the-Loop
ORM	Operational Risk Management
PBT	Persistent Bioaccumulative Toxic
PEA	Programmatic Environmental Assessment
PK₁₅(met)	Peak Noise Exceeded by 15 Percent of Firing Events
PM	Particulate Matter
POI	Point of Interest
ppm	Parts per Million
psf	Pounds per Square Foot
PZ	Primary Extraction Zone
RBC	Risk-based Criteria
RCRA	Resource Conservation and Recovery Act
RCW	Red-cockaded Woodpecker
RDT&E	Research, Development, Test, and Evaluation
REA	Range Environmental Assessment
ROI	Region of Influence
RUR	Range Utilization Report
SABRE	Shallow Water Assault Breaching
SDZ	Surface Danger Zone
SEL	Sound Exposure Level
SESOIL	Seasonal Soil Compartment Model
SHPO	State Historic Preservation Officer
SO₂	Sulfur Dioxide
SOF	Special Operations Forces
SO_x	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasures
SRI	Santa Rosa Island
SWMCM	Shallow Water Mine Countermeasures
TA	Test Area
TCP	Traditional Cultural Property
TP	Training Practice
TRI	Toxic Release Inventory
TRI-DDS	Toxic Release Inventory-Data Delivery System
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The Eglin Military Complex, located in the northwest Florida panhandle (Figure 1-1), is one of 19 component installations categorized as a Department of Defense (DoD) Major Range Test Facility Base. Eglin Air Force Base (AFB) is situated among three counties: Santa Rosa, Okaloosa, and Walton. Eglin AFB's primary function is to support research, development, test, and evaluation (RDT&E) of conventional weapons and electronic systems. It also provides support for individual and joint training of operational units. The Eglin Military Complex currently comprises four components (U.S. Air Force, 2001), which do not include the cantonment or main base areas:

1. Test areas/sites
2. Interstitial areas (areas beyond and between the test areas)
3. The Eglin Gulf Test and Training Range
4. Airspace (overland and water)

The U.S. Air Force Air Armament Center (AAC) is responsible for the Eglin Military Complex and all its users, which include DoD, other government agencies, foreign countries, and private companies. For Range operations, AAC provides environmental analyses and necessary National Environmental Policy Act (NEPA) documentation to ensure compliance with U.S. Air Force policy and applicable federal, state, and local environmental laws and regulations.

AAC includes two wings and four directorates that collectively operate, manage, and support all activities on the Eglin Military Complex. AAC accomplishes its Range operations through the 46th Test Wing (46 TW) with support from the 96th Air Base Wing. The 46 TW Commander is responsible for the day-to-day scheduling, executing, and maintaining of this national asset. Santa Rosa Island (SRI) makes up a portion of the Eglin Military Complex and supports a variety of testing and training missions. The continued DoD utilization of the Eglin Military Complex requires flexible and unencumbered access to land ranges and airspace, which support all of Eglin AFB's operations.

1.2 PROPOSED ACTION

The Proposed Action is for the 46 TW to establish a new authorized level of activity for SRI that is based on an anticipated maximum usage. Demonstrating that the individual and cumulative effects of this usage level would not have significant environmental impacts is the method for establishing the maximum threshold baseline, identified as the Range Environmental Impact Analysis Process (EIAP) Baseline. The environmental analysis is accomplished by evaluating the effects that the military mission activities and expendables have on Eglin AFB's natural, physical, and cultural environment.



Figure 1-1. Land and Water Ranges of the Eglin Military Complex

The military mission has been broadly identified as the effector 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 detailed in this report.

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

1. Purpose: to quickly and efficiently process new programs requesting access to SRI 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 re-evaluating 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 of mission activities on SRI in the 2005 *Santa Rosa Island Mission Utilization Plan Final Programmatic Environmental Assessment* (PEA) (U.S. Air Force, 2005). Some of Eglin AFB's mission activities have changed since the original environmental analysis was done, requiring new environmental analysis to be performed. Currently, when approval for a new mission is requested, it may be categorically excluded from additional environmental analysis if it is similar in action to a mission that has been previously assessed and the assessment resulted in a finding of no significant environmental impact. The categorical exclusion (CATEX) designation is in accordance with NEPA and Air Force regulations (Council on Environmental Quality 32 Code of Federal Regulations 989.13 and Air Force Instruction [AFI] 32-7061).

Since some of these ongoing mission activities were originally assessed, and also since some of the mission activities used for CATEX purposes were assessed, changes have occurred at Eglin AFB that could affect environmental analysis. The types of changes resulting in the need to reevaluate the NEPA analysis individually and cumulatively include the following:

- Additional species have been given federal and state protected status.
- Critical habitat for federally listed species has expanded.
- Species not previously known to exist at Eglin AFB have been discovered.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin AFB's borders has increased.
- Air Force regulations have changed.
- Military missions and weapons systems have evolved.

The analysis discussed in this report allows for a cumulative look at the impact on SRI receptors from all mission activities. By implementing an authorized level of activity, Range management will be streamlined and cumulative environmental impacts will be more fully considered.

1.3 SCOPE OF THE PROPOSED ACTION

The region of influence (ROI) for this analysis is the landmass of SRI plus the Gulf side shoreline to a depth of 30 feet (referred to as the “SRI surf zone”) (Figure 1-2). This document addresses only those activities occurring within the referenced ROI and is meant to tier off the Estuarine/Riverine and Eglin Gulf Test and Training Range (EGTTR) PEAs. As a result, activities and resources in Santa Rosa Sound and bays are addressed in the *Estuarine and Riverine Areas Final Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 2004), while activities and resources of the Gulf of Mexico beyond the surf zone are addressed in the *Eglin Gulf Test and Training Range Final Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 2002). Additionally, the air operations that occur in the airspace overlying SRI are not included in the scope of this Proposed Action. An exception to this is the air operations involving Open Air Hardware in the Loop (OA-HITL) Tower testing, described later in this document. All other air operations are analyzed cumulatively in the *Overland Air Operations Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 1998a).

SRI is a narrow barrier island approximately 50 miles long and less than 0.5 miles wide, separated from mainland northwest Florida by Santa Rosa Sound, a shallow lagoon varying in width from 400 to nearly 5,000 feet, and Choctawhatchee Bay. SRI is bordered on the south shore by the Gulf of Mexico and on the north shore by Santa Rosa Sound and Choctawhatchee Bay. Eglin AFB controls 4,760 acres of SRI: a 4-mile strip eastward of Fort Walton Beach and a restricted access 13-mile section extending west to Navarre Beach, Florida. There are 2.5 miles of Okaloosa County property between the two parcels of Eglin property. Eglin also controls a small test site (A-5) within this portion of SRI. Each of the three sections of SRI has unique characteristics (developed versus undeveloped land), and 15 Eglin AFB test sites are located on SRI (U.S. Air Force, 1997).

SRI provides a unique environment for military operations, including access to littoral areas. The variety of environments on SRI and Eglin AFB afford opportunities to train in diverse conditions. The opportunity to train within these types of areas was a key factor in selecting Eglin AFB as a suitable and desirable location for 7 Special Forces Group (Airborne) (7SFG(A)) related to Base Realignment and Closure actions. Local units that routinely utilize SRI include, but are not limited to, 7 SFG(A), HAVE ACE, 1 Special Operations Wing (1 SOW), 720 Special Tactics Group (STG), STTG, 6 Ranger Training Battalion (6RTB), 23 Special Tactics Squadron (STS), 14 Weapons Instructor Course (WIC), and 342 Training Squadron Detachment (TRS). Other units deployed temporarily to Eglin or Hurlburt also conduct missions at SRI. These units include US Army SF and Rangers, US Navy Special Boat Team (SBT) and Sea-Air-Land Teams (SEAL), US Air Force Combat Control Team (CCT) and Tactical Air Control Party (TACP), U.S. Marine Corps Special Operations Forces (MARSOFF), and allied foreign Special Operations Forces (SOF).

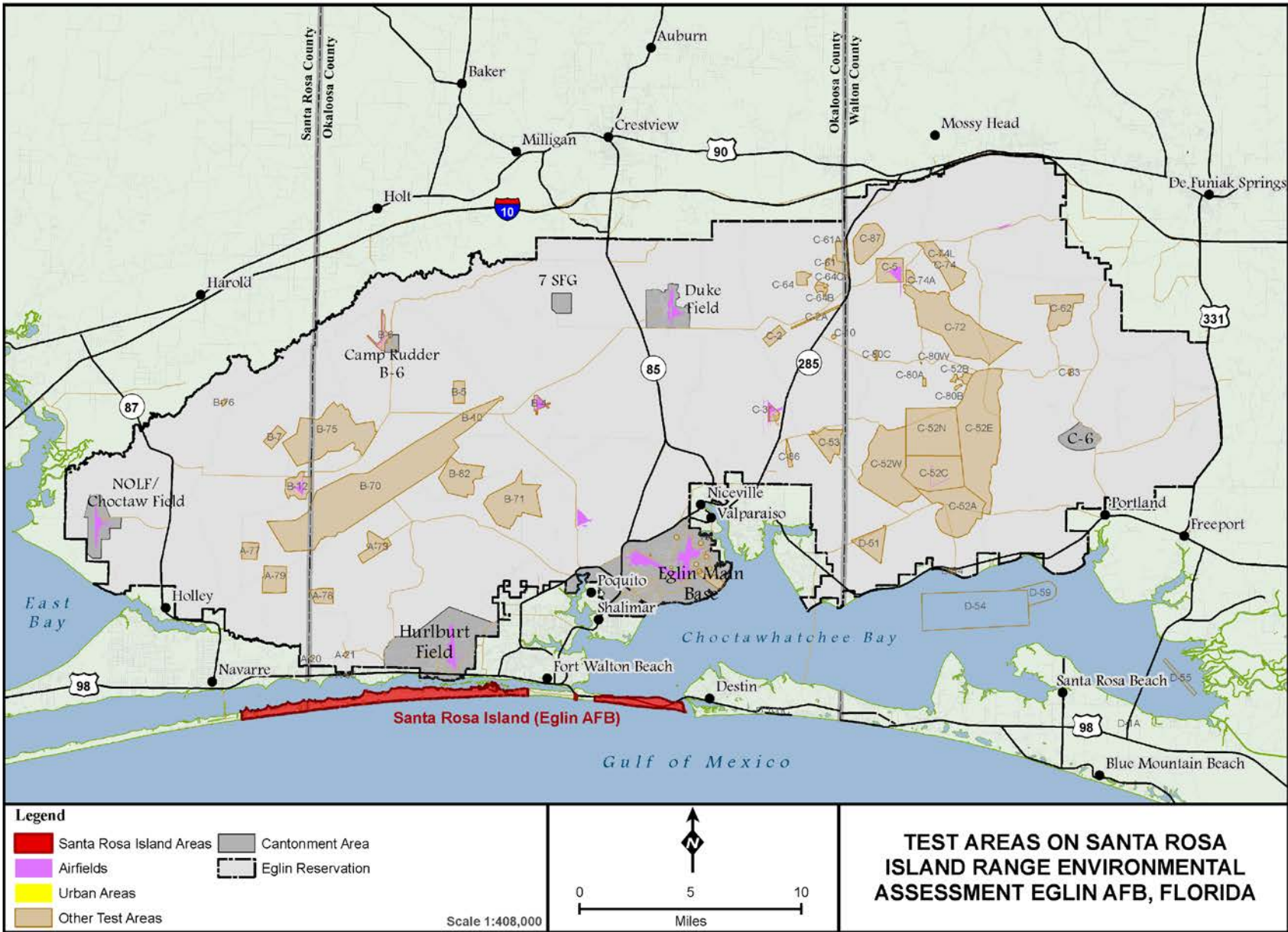


Figure 1-2. Santa Rosa Island Range of Influence

In addition to the SRI landmass, this document also addresses the SRI surf zone. The surf zone is a shallow area covering the continental shelf seaward of SRI to a depth of approximately 30 feet. The distance from the SRI shoreline that corresponds to this depth varies from approximately 0.5 miles at the western side of the Air Force property to 1.5 miles at the eastern side, extending out into the inner continental shelf. Relict sand ridges form in an approximately northwestern orientation at depths of about 18.3 meters (60 feet) and deeper. The DeSoto Canyon, at the edge of the shelf, is approximately 100 kilometers (62 miles) south of SRI (U.S. Air Force, 1997).

Current land use within the SRI ROI consists of military mission activities, natural and cultural resource management, and public use. Historical land use activities and locations typically used for these activities (as evidenced by past usage) are reflected in Figure 1-3. Military mission activity occurs across the length of Eglin-owned property and may generally be categorized as testing or training activities. The purpose of test missions is to verify, validate, or demonstrate operational capabilities of new or upgraded hardware, software, aircraft, or weapons systems or the effectiveness of tactics. Training missions or activities are designed to teach, maintain, or increase operational proficiency. Major types of testing and training missions are described below. Detailed mission and land use descriptions are provided in Appendix A.

- Surface-to-air missile testing. These activities involve missile launches from SRI or surface vessels, targeting aircraft in the EGTTR. Typical missiles include PATRIOT, AMRAAM, and AIM.
- Electronic countermeasures and electronic systems testing. Electronic countermeasures (ECM) testing evaluates an aircraft system's ability to defeat threats and includes training on combating electronic signals. Training is mostly conducted over water ranges. Electronic systems testing include any electronic systems other than ECM, such as radar and radio. These missions are flown at low-to-moderate altitudes and usually involve SRI test facilities.
- Open air hardware in the loop testing. The OA-HITL Tower at Test Area (TA) A-13B, as well as additional focus sites, is used to support these activities. The tower links to other facilities to provide advanced simulations in lieu of actual flight testing. The tower is also used to test and evaluate Command, Control, Communications, Computers, Intelligence, and Surveillance/Reconnaissance (C4ISR) systems.
- Ground testing and training. Some groups conduct ground testing and training exercises within the SRI ROI. Ground testing typically supports littoral warfare programs and may involve testing of equipment, obscurants, and biological aerosol simulants. Ground training activities may be categorized as maneuvers or static training. Maneuvers involve a variety of activities, such as the 6th Army Ranger Training Battalion's Los Banos Training, Advanced Skills Training, and HAVE ACE Special Operations. These activities may involve the use of small-arms blank ammunitions, live fire (using live rounds instead of blanks), smokes, or other expendables. Live fire events on SRI, though rare, may include use of small arms munitions (e.g., 5.56 mm rounds) as well as larger caliber rounds, such as the 30 mm. Live fire may occur only in designated areas with safety measures in place. Maneuvers may occur during the day or night. Static ground operations involve stationary exercises such as communication system training.

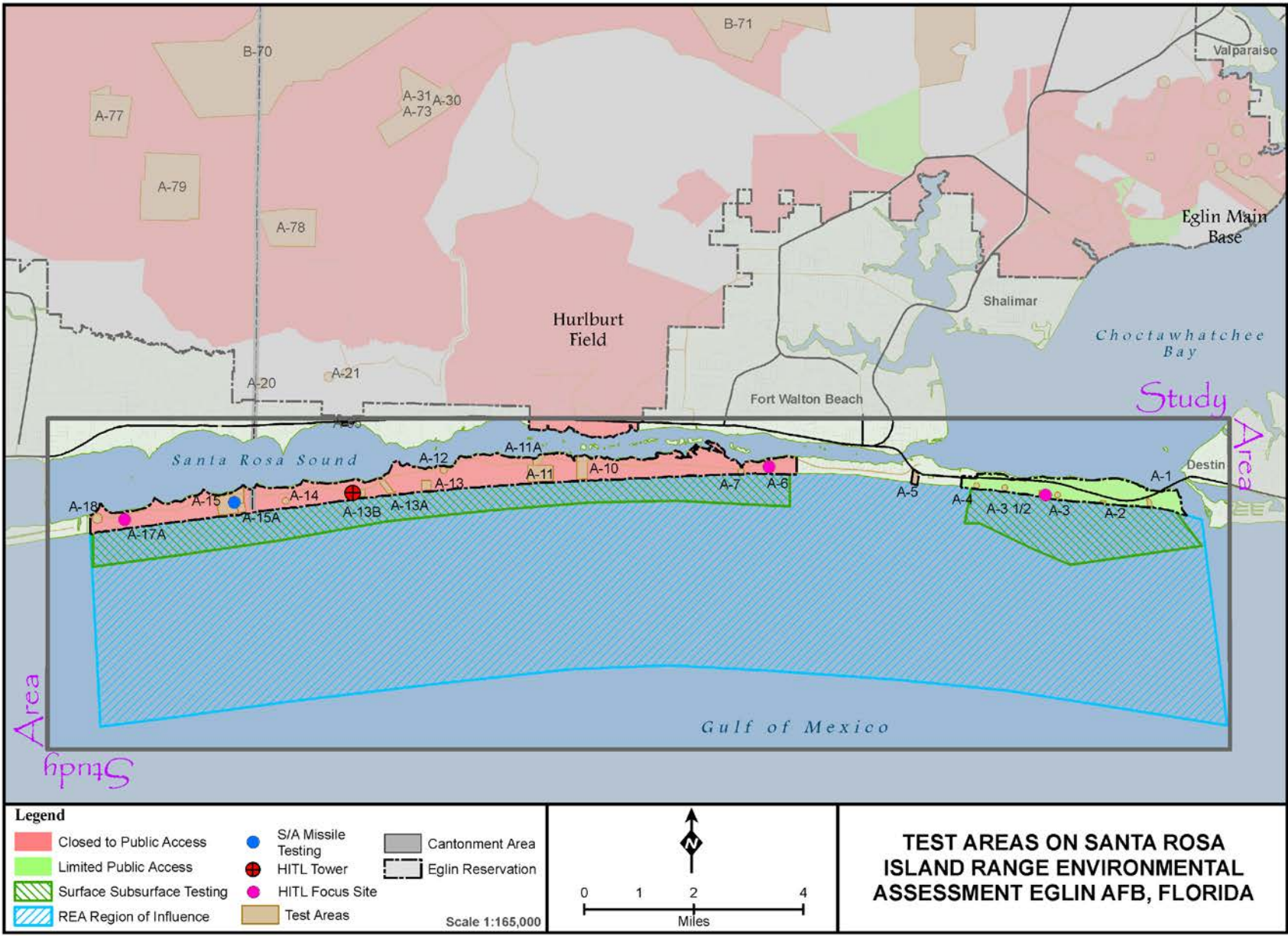


Figure 1-3. Mission and Land Use Areas Within the Santa Rosa Island Region of Influence

- Surf zone testing and training. Surf zone testing and training activities occur within the Gulf-side shallow water (30-foot maximum depth) environment of SRI. Such activities include mine- and obstacle-clearing training and landing craft air cushion (LCAC) operations. Some of these actions are currently authorized for the Naval Surface Warfare Center, Panama City (NSWC PCD) through other NEPA documents and regulatory consultations. Limited numbers of live detonations of less than 75 pounds (lbs) and line charges consisting of a series of 5-lb charges totaling up to 1,750 lbs for use during mine and obstacle clearing have been approved (refer to the NSWC PCD Environmental Impact Statement/Overseas Environmental Impact Statement [EIS/OEIS] [U.S. Navy, 2009] and the consultations for that action, the NOAA Fisheries Biological Opinion Incidental Take Statement [NOAA, 2011] and NOAA Fisheries Marine Mammal Protection Act Letter of Authorization [LOA] [NOAA 2010] for a description of surf zone detonations). Thus, that action for the NSWC is incorporated into this Environmental Assessment (EA) by reference. This EA does not propose nor analyze additional live surf zone detonations. Any such actions, other than that addressed in the NSWC PCD EIS (U.S. Navy, 2009) and consultations (NOAA, 2011; 2010) would be required to undergo evaluation on a case-by-case basis through the Air Force 813 process. During LCAC training, 30-mm ammunition may be used at specific locations and specific targets. Deviations from specific test and location parameters for LCAC training in this EA would constitute a new activity, requiring separate environmental impacts analysis through the Air Force 813 process. Other training missions involve shoreward and seaward movement of small craft and personnel through the surf zone. Scuba training is associated with some of the training, such as Advanced Skills Training.
- Laser use. A number of missions on SRI involve laser use. Lasers are used to detect obstacles, aircraft, and biological aerosol simulants.

Natural and cultural resource management on SRI consists of managing protected species, habitats, and cultural/archaeological sites. These activities are conducted under separate programs and are not considered part of baseline missions in this document. These activities have been evaluated under separate regulatory and environmental documentation, including the Eglin AFB *Integrated Natural Resources Management Plan (INRMP)* (U.S. Air Force, 2002b), the *INRMP Environmental Assessment* and *INRMP Biological Assessment* (U.S. Air Force, 2002c), and the Eglin AFB *Integrated Cultural Resources Management Plan* (U.S. Air Force, 2006b). Authorized public use of SRI occurs only on county-owned property, the limited access portion of the island east of Fort Walton Beach, and within the waters of the Gulf of Mexico, Santa Rosa Sound, and Choctawhatchee Bay.

1.4 DECISION DESCRIPTION

The 46 TW desires to authorize a new level of activity for SRI, replacing the current authorized level, as discussed in Chapter 2. 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 SRI more quickly and efficiently. Authorization of a new level of activity will

streamline the environmental process, enhancing Eglin AFB'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 environment 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 SRI resource areas were identified through preliminary investigation. Resource areas identified for detailed analysis are described below, with narratives summarizing preliminary screening for potential impacts.

Chemical Materials/Debris

Chemical materials encompass liquid, solid, or gaseous substances released to the environment as a result of mission activities. For the SRI ROI, these materials would potentially include munitions and pyrotechnic combustion byproducts and residual fuel leaks or spills. Combusted byproducts of munitions and smoke dyes may potentially affect air quality, water quality, and sediments. The environmental analysis of chemical materials describes the amounts, extent, and estimated concentrations of chemical materials produced by these mission activities with regard to potential impacts to vegetation, wildlife species, and surface water and sediment quality. The potential influences of the sediment and water environment and food chain on the availability and translocation of chemical contaminants are also evaluated. Chemical analysis will also evaluate testing and training activities in relation to the Environmental Restoration Program sites located on SRI.

Debris includes the physical materials deposited on the surface of terrestrial or aquatic environments during mission activities, analogous to litter. This category differs from chemical materials by focusing on the physical disturbance rather than the chemical alterations that could result from the residual materials. Examples of debris include shrapnel deposited from bombs and missiles, chaff and flare cartridges, and intact inert bombs. There are no major debris issues for the SRI ROI because most user groups adhere to post-mission cleanup policies, so that debris left behind is likely unintentional, accidental, or the result of an item simply being irretrievable or lost. The potential for debris to strike an object or organism is covered under the appropriate resource area.

Soils

SRI is a barrier island complex, with the typical landforms of beaches, coastal dunes, interior dunes, and low-lying soundside beaches and marshes. Soils occurring in the SRI ROI consist primarily of sandy materials. Soils have the potential to be impacted by test and training activities. Analysis addresses the potential for dune alteration, impacts due to digging, soil quality impacts due to munitions residue, and off-road vehicle use.

Water Resources

Water resources within the SRI ROI include surface waters (ponds) and subsurface waters (the water table), wetlands, floodplains, and the coastal zone. The Proposed Action has the potential to impact water resources within and around the ROI. Water resource analysis addresses the potential for impacts due to sedimentation and/or contamination related to testing and training activities and associated expendables. All of the SRI ROI is designated as a Special Flood Hazard Area and also as a FEMA Zone V, which corresponds to coastal floodplains subject to hazards from storm waves. Floodplain analysis addresses potential impacts due to topographic alterations associated with test and training activities. Coastal zone analysis addresses consistency of the proposed testing and training activities with the 23 statutes composing Florida's Coastal Zone Management Plan.

Biological Resources

Biological resources may be affected by the Proposed Action. Issues to be examined include potential impacts on wildlife and vulnerable species and habitats from direct physical impact, habitat alteration, and noise. "Direct physical impact" is the physical harm that can occur to an organism (plant or animal) or habitat as a result of mission or land use activities. Examples include aircraft collisions with birds, vessel collisions with animals, vehicle-animal road collisions, crushing an organism by vehicle or foot traffic, and ordnance shrapnel or debris striking an organism. Such impacts can lead to other effects, such as loss of vegetation and erosion. Terrestrial and marine species potentially impacted by testing and training in the SRI ROI include perforate reindeer lichen (*Cladonia perforate*), shorebirds, the Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*), sea turtles, bottlenose dolphins (*Tursiops truncates*), and the Gulf sturgeon (*Acipenser oxyrinchus desotoi*).

Habitat alterations are described as physical damage, stress, or disruptions that may adversely alter or degrade terrestrial or marine habitats. A habitat refers to the ecologic and geomorphologic components that support organisms such as vegetation, soil, topography, and water. Subsequent degradation of unique and diverse habitats may impact sensitive species. Examples of habitat alteration include soil erosion, sedimentation of aquatic habitats, physical changes in topography, and wildfires. Habitat alteration can contribute to physical stress, injury, or mortality to the biological components of habitats. Activities with potential consequences to habitats in the SRI ROI include vehicle and foot traffic.

Analysis of potential noise impacts in this section focuses on biological resources and consists of identifying sensitive species and habitats within the SRI ROI, 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 historic structures, archaeological sites, and/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.

Air Quality

Testing and training activities would release emissions into the air. The primary emissions sources are intermittent releases of combustive materials generated by vehicles and equipment, such as aircraft and LCACs, and the use of smokes and obscurants during some training activities. Analysis addresses the expected levels of emissions and compares these levels with what is currently permitted from all Eglin AFB sources and county emissions.

Noise

Noise is defined for the SRI ROI as the sound produced by mission testing or training activities that could potentially affect the community or protected species. Noise may directly inconvenience and/or stress humans and wildlife species, and may also cause hearing loss or 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. The impacts of noise to the public and on wildlife, particularly threatened and endangered species, are a primary concern. Noise may be produced within the SRI ROI by testing and/or training activities involving munitions and door-breaching detonations, the use of gunnery, and LCAC operations and from low-level aircraft. Scientific data correlating the effects of noise on humans are well documented, and accepted analysis techniques will be used to evaluate the potential effects of noise to the public.

Safety/Restricted Access

Safety involves hazards to military personnel and the public resulting from mission activities. Restricted access is typically the result of safety considerations. Restricted access is a decrease in the availability of Eglin resources to the public resulting from the temporary closure of test areas, interstitial/recreational areas, or public roads because of mission activities. Receptors potentially impacted include the military and the public desiring to use these areas. Mission activities of potential consequence to restricted access and safety within the SRI ROI involve the use of low-level aircraft, live munitions and firing, and the need for area closures to nonparticipating personnel due to large-scale training exercises.

A large part of SRI is closed to the public, but due to the accessibility to the island afforded by the Gulf of Mexico and Santa Rosa Sound, members of the public can and do enter closed areas. This unauthorized access can have effects on the mission as well as to natural and cultural resources that the Air Force strives to protect. The analysis will identify the areas where unauthorized access is occurring, evaluate the potential impacts that result, and present Air Force solutions for managing the issues associated with unauthorized access to restricted areas.

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. Land use on the landmass portion of the SRI ROI consists entirely of military training and testing activities. No change to this current use is expected. However, land use and recreational activities within the surf zone (e.g., recreational watercraft

use) and at the Okaloosa County property situated between the two Eglin SRI parcels may potentially be impacted by temporary access restrictions during certain testing and training activities.

Socioeconomics

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 SRI ROI. The socioeconomic receptors include nearby communities and property impacted by the noise from ordnance. Analysis focuses on the exposure of these communities to anticipated environmental effects and identifying whether potential concern areas are disproportionate to other communities in the region.

1.6 FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

Future SRI testing and training activities will require an amendment letter to the U.S. Fish and Wildlife Service pertaining to the existing Biological Assessment and Biological Opinion under Section 7 of the Endangered Species Act (ESA). The amendment letter will describe potential impacts to federally listed species and establish appropriate avoidance and minimization measures, as well as terms and conditions, to minimize impacts to threatened and endangered species.

Some components of this action would take place within or otherwise may affect the jurisdictional concerns of the Florida Department of Environmental Protection and will, therefore, require a consistency determination with respect to Florida's Coastal Zone Management Plan under the federal Coastal Zone Management Act (Appendix E).

2. ALTERNATIVES

2.1 INTRODUCTION

This chapter introduces the alternatives evaluated for potential environmental impacts in this Range Environmental Assessment (REA) for the SRI ROI. The proposed alternatives, which are detailed in this document, are:

- No Action Alternative: Baseline, as defined by the Preferred Alternative in the *Santa Rosa Island Mission Utilization Plan PEA* (U.S. Air Force, 2005).
- Alternative 1: Authorize current level of activity plus foreseeable future activities.
- Alternative 2 (Preferred Alternative): Alternative 1 with mission surge capacity.

The following section briefly describes each alternative, including quantification of the alternative-specific expendables when applicable.

2.2 ALTERNATIVES CONSIDERED

The alternatives considered for analysis were determined during an interdisciplinary meeting at Eglin AFB, which included, but was not limited to, representatives from the 46th Test Wing, Plans Office (46 TW/XP), 96th Civil Engineer Group (96 CEG)/Environmental Analysis Section (CEVSP) and the Natural Resources Section (96 CEG/CEVSN). The alternatives chosen resulted from discussions on how foreseeable future activities will expand Eglin AFB's testing and training requirements in upcoming years. No alternatives were eliminated from detailed analysis.

2.2.1 No Action Alternative

The No Action Alternative would authorize the baseline set of test and training activities within the SRI ROI, as described in the Preferred Alternative of the Santa Rosa Island Mission Utilization Plan PEA (U.S. Air Force, 2005). The 2005 PEA does not quantify activity levels in terms of the overall number of expendables, but it provides a description and qualitative discussion of each activity. Therefore, this alternative would authorize types of activities without quantification of expendables associated with the activities. Locations of mission use areas authorized by the Preferred Alternative of the 2005 PEA are shown in Figure 2-1. Specific activities evaluated in the 2005 PEA, along with the locations, are listed in Table 2-1.

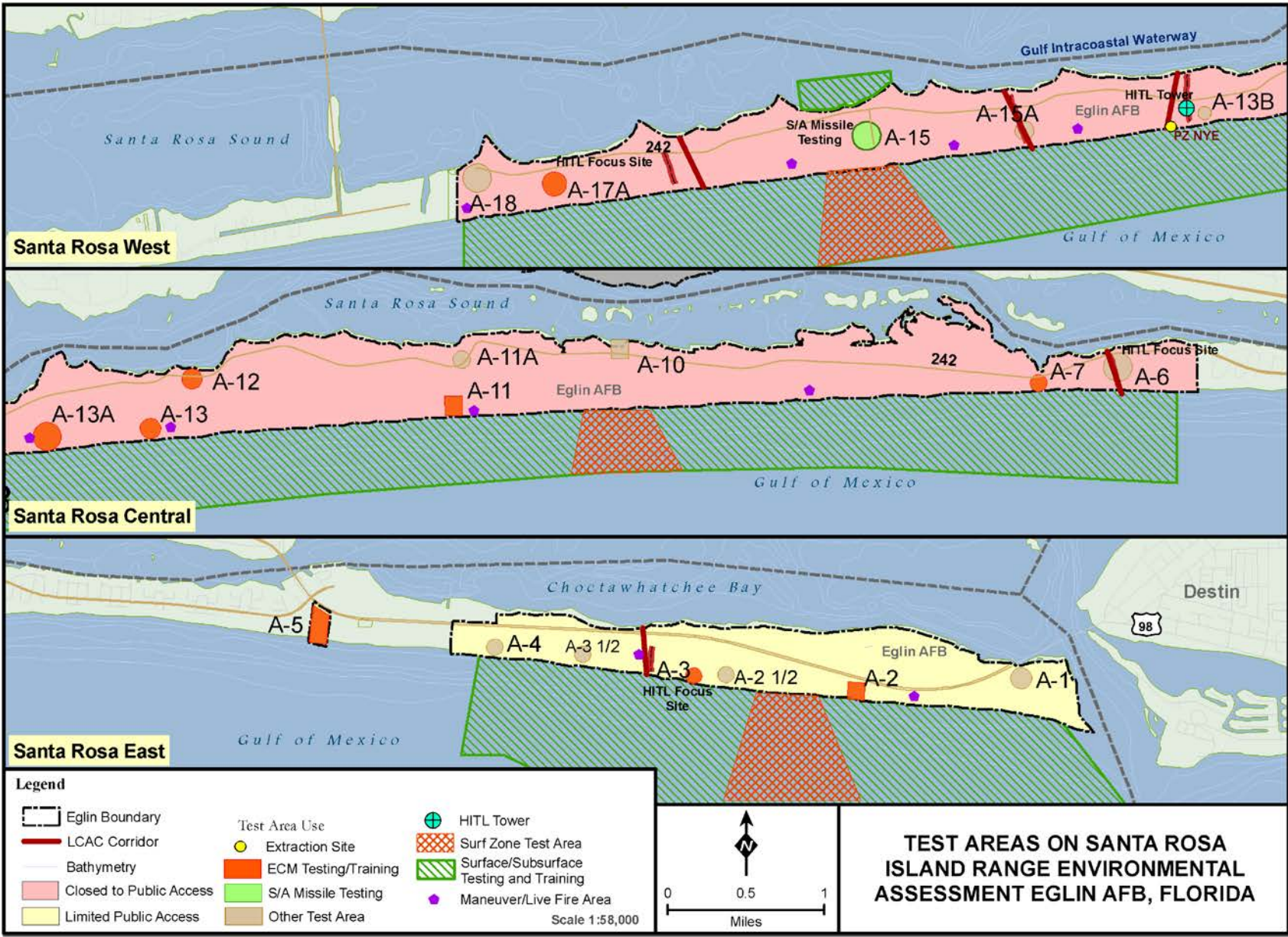


Figure 2-1. Santa Rosa Island Mission Use Areas, No Action Alternative

Table 2-1. Missions and Locations for Activities Evaluated in the SRI Mission Utilization Plan

Activity ¹	Location
Electronic systems/electronic countermeasures testing/training	TS A-2, A-3, A-5, A-7, A-11, A-12, A-13, A-13A
Surface-to-air missile training	TA A-15, A-10
Expanded OA-HITL testing	OA-HITL Tower (TS A-13B) and focus sites (TS A-3, A-6, A-17A)
Expanded surf zone testing/training in established test areas	TA A-15, A-10, A-2
Ground testing/training	Various locations across island
Personnel/equipment drops and extractions	Throughout surf zone; OPUS and NYE primary extraction zones
Expanded LCAC training/maneuvers	Various locations (Figure 2-1)
Expanded special operations training	Various locations across island
Amphibious assaults	Between TAs A-10 and A-15

LCAC = landing craft air cushion; TA = test area; TS = test site; OA-HITL = open air hardware in the loop

1. U.S. Air Force, 2005

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

Alternative 1 would authorize the current level of activity, including the associated number of expendables, plus foreseeable future activities. Thus, this alternative would establish a quantity of expendables associated with baseline activities described in the *Santa Rosa Island Mission Utilization Plan PEA Preferred Alternative* (U.S. Air Force, 2005). However, Alternative 1 includes revisions to some mission locations and the number of areas used for particular activities. These revisions are described in the following paragraphs. The current level of activity is defined as the maximum annual expenditure for each type of expendable reported from Fiscal Year (FY) 1997 through FY2008; this approach accounts for periods of low or no activity for a given mission. Information on the number of expendables by year within the SRI ROI was obtained from the Eglin AFB Range Utilization Report (RUR) database and represents the best available data (U.S. Air Force, 2008). However, expendables information was not reported specifically for SRI between FY2005 and FY2008; therefore, expenditures for these years are not available for inclusion in Alternative 1. This alternative would be implemented using management actions identified in Section 2.5, *Management Requirements*, and Chapter 4. The maximum annual number of expenditures for each munition under this alternative is presented in Table 2-2.

Revisions to the baseline set of test and training activities within the SRI ROI include reducing the number of LCAC crossover corridors, establishing a close quarters battle (CQB) training area and a dedicated training area (Advanced Littoral Reconnaissance Technologies [ALRT] Project Area), and increasing in the number of boat landing sites and helicopter landing zones. These areas are shown in Figure 2-2 and have been established through coordination with the Eglin Natural Resources and Cultural Resources Sections, to avoid or minimize, as much as extent possible, potential impacts to sensitive areas (Figure 2-3). LCAC missions have not been conducted on SRI since 2002, and none are currently planned. Most of the LCAC crossover corridors approved in the 2005 PEA would be eliminated under Alternative 1, with one corridor remaining near Test Site A-13B.

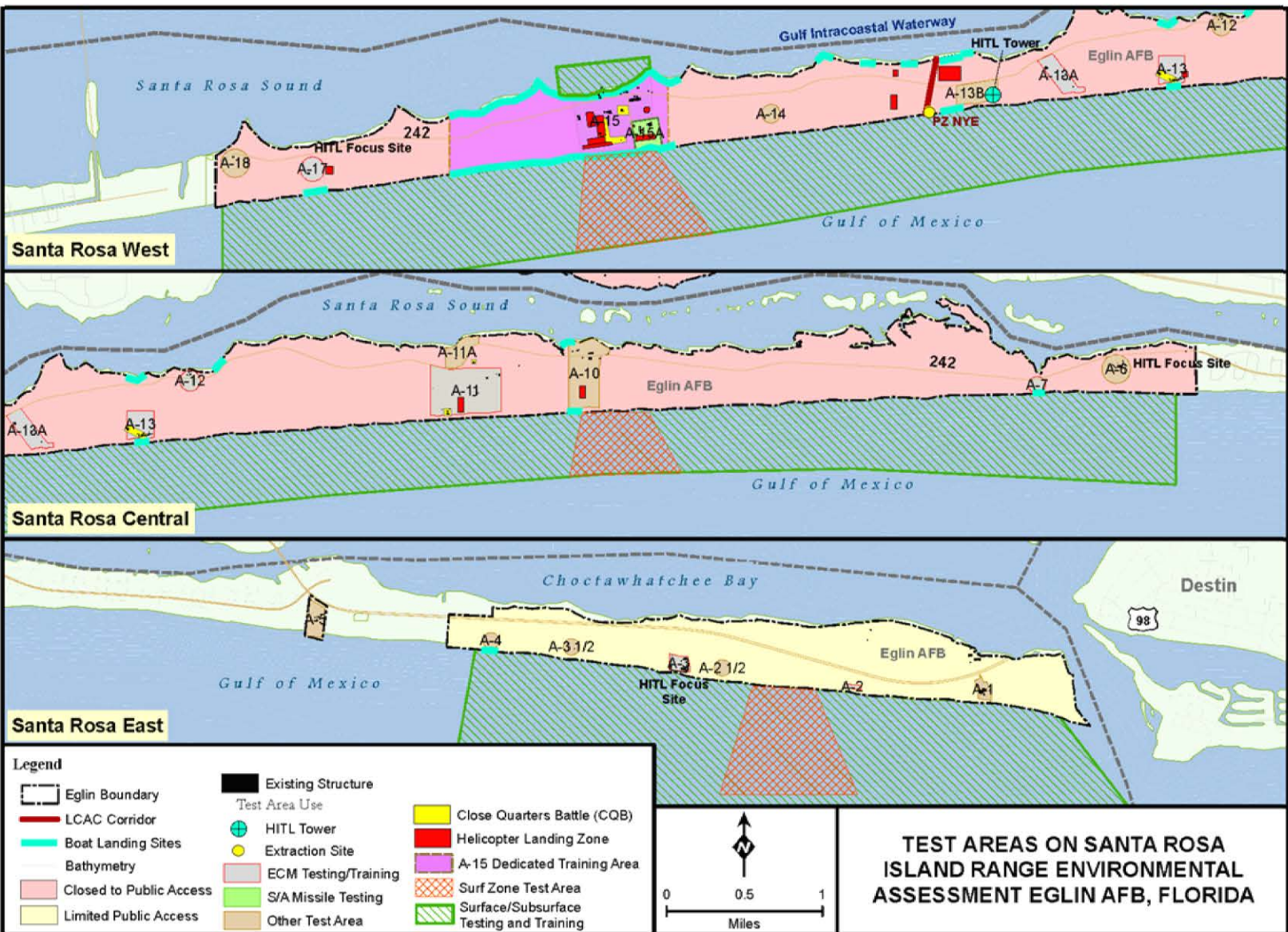


Figure 2-2. Santa Rosa Island Mission Use Areas, Alternative 1

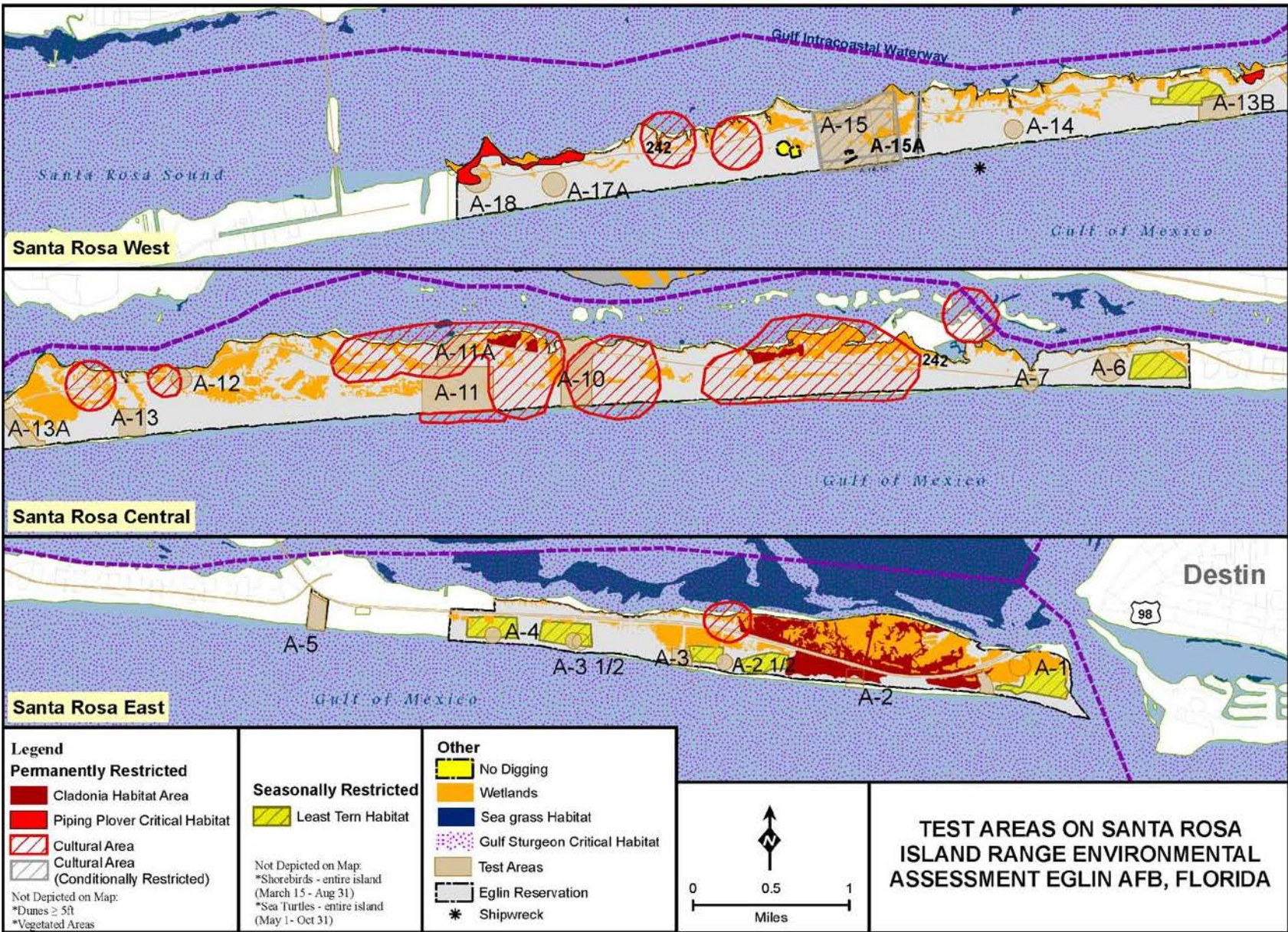


Figure 2-3. Santa Rosa Island Environmental Resource Areas

Under Alternative 1, Eglin AFB would establish a CQB training area and a dedicated training area. The CQB area would consist of facilities at Test Area A-15 and Test Sites A-13 and A-11. Training activities include small arms blanks, small pyrotechnic devices, and small door breaching charges and small explosive charges (maximum of 0.66 pounds net explosive weight [NEW]), which would be used in and around buildings.

Due to the ongoing, active training at A-15, and the sometimes immediate need for a specific training event, a dedicated training area is needed almost continually. Alternative 1 includes the establishment of such an area at A-15. The site boundary would coincide with the ALRT Project Area (Figure 2-1) and would extend into the littoral zones of the Gulf of Mexico (GOM) and Santa Rosa Sound. The site would support a variety of training activities (for SOF and possibly other groups) involving troop movement, boat and helicopter landings, and vehicle use in approved areas. Regulatory consultation would be conducted for continual use of this site and the resulting management requirements implemented on an ongoing basis. It is anticipated that management requirements would include, but not necessarily be limited to, pre- and post-mission protected species surveys, avoidance of shorebird nests and established dune habitat, and possible relocation of sea turtle nests. Avoidance areas would be marked as necessary. In the event that training activities at other test areas require transit to A-15, travel corridors would be physically delineated to avoid impacts to natural and cultural resources. Management requirements would not be needed for cultural resources at the dedicated training area, as no such resources are located in the vicinity.

A total of 16 boat landing sites (BLSs) would be designated on the sound- and Gulf-sides of SRI. This would include designation of 10 new sites in addition to 6 existing sites. A total of 14 helicopter landing zones (HLZ) would be designated, including 9 on unimproved surface and 5 on paved surface. BLSs and HLZs are used in a variety of missions.

2.2.3 Alternative 2: Alternative 1 with Mission Surge (Preferred Alternative)

This alternative is defined as authorizing the level of activity as described under Alternative 1, plus an increase in mission activity (testing and training) to achieve an optimum usage level, including management actions detailed in Chapter 4 and summarized in Section 2.5, Management Requirements. The optimum usage level was chosen as a likely maximum surge increase in military testing and training during a national defense contingency. Table 2-2 shows the maximum number of expendables under Alternative 2.

This alternative includes authorization of the proposed level of activity and performance of a comprehensive environmental analysis to ensure that the SRI ROI can support this level of activity without incurring significant environmental impact. This is the Preferred Alternative because it includes all mission activities expected to occur and provides capacity for a test surge. This alternative authorizes an expected maximum level of activity, which facilitates responsiveness to the customer while ensuring that cumulative environmental effects do not cause significant impacts.

Table 2-2. Maximum Annual Expendables for SRI Under Alternatives 1 and 2

Expendable Category		Expendable	Alternative 1	Alternative 2
Artillery Simulator			525	2,100
Missile ¹			3	12
Drone ¹			3	12
Gun (inert)		30-mm	353	1,412
		7.62-mm	234,779	939,116
		5.56-mm	549,797	2,199,188
Grenades (smoke)			703	2,812
Explosive	Pentolite HE (per pound)		16	64
Flares			308	1,232
Chaff			481	1,924
Laser			6	24
Other	Blasting cap		162	648
	Blasting fuze		958	3,832
	Detonation cord		11,196	44,184

mm = millimeter; TP = training practice; HE = high explosive

1. Missile and drone expenditure information is not recorded in the Range Utilization Report (RUR) data but is available in other Eglin AFB documentation

2.3 COMPARISON OF ALTERNATIVES

Potential impacts under each alternative are summarized below.

Table 2-3. Summary of Potential Impacts Under All Alternatives

Resource	No Action Alternative	Alternative 1	Alternative 2
Chemical Materials/debris	There would be no significant impacts under the No Action Alternative. Harmful levels of chemical materials would not occur due to mission activities. Eglin AFB would respond to hazardous material spills or other incidents according to established procedures.	There would be no significant impacts under Alternative 1. Harmful levels of chemical materials would not occur due to mission activities. Eglin AFB would respond to hazardous material spills or other incidents according to established procedures.	There would be no significant impacts under Alternative 2. Harmful levels of chemical materials would not occur due to an increased number of mission activities. Eglin AFB would respond to hazardous material spills or other incidents according to established procedures.
Soils	There would be no significant impacts under the No Action Alternative. Ground maneuvers, LCAC operations, and surf zone testing would not adversely impact soil resources, particularly with the implementation of management actions.	There would be no significant impacts under Alternative 1. Ground maneuvers, LCAC operations, and surf zone testing would not adversely impact soil resources, particularly with the implementation of management actions.	There would be no significant impacts under Alternative 2. Increased numbers of ground maneuvers, LCAC operations, and surf zone testing would not adversely impact soil resources, particularly with the implementation of management actions.
Water resources	There would be no significant impacts under the No Action Alternative. Mission activities would not adversely impact surface waters, subsurface waters, or floodplains, particularly with	There would be no significant impacts under Alternative 1. Mission activities would not adversely impact surface waters, subsurface waters, or floodplains, particularly with the implementation of management	There would be no significant impacts under Alternative 2. An increased number of mission activities would not adversely impact surface waters, subsurface waters, or floodplains, particularly with

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	No Action Alternative	Alternative 1	Alternative 2
	the implementation of management actions. There would be no adverse impacts to wetlands with adherence to required protection measures.	actions. There would be no adverse impacts to wetlands with adherence to required protection measures.	the implementation of management actions. There would be no adverse impacts to wetlands with adherence to required protection measures.
Biological resources	There would be no significant impacts to biological resources under the No Action Alternative due to noise, physical impacts, or habitat alteration. Potential adverse impacts to species and habitats would be decreased by implementation of management actions.	There would be no significant impacts to biological resources under Alternative 1 due to noise, physical impacts, or habitat alteration. Potential adverse impacts to species and habitats would be decreased by implementation of management actions.	There would be no significant impacts to biological resources under Alternative 2 due to noise, physical impacts, or habitat alteration. Adverse impacts to species and habitats potentially caused by an increased number of munitions and expendables would be amended by implementation of management actions.
Cultural resources	<p>There would be no significant impacts under the No Action Alternative. Because activities such as ground training, amphibious landing activities and surf zone testing have the potential to adversely affect cultural resources, coordination with 96 CEG/CEVSH would be required prior to any activities outside of currently approved test and training areas or above levels currently represented by the No Action Alternative.</p> <p>Cultural resources would be clearly marked and considered off limits. In the event of an inadvertent discovery, all training and testing would cease until Eglin's Base Historic Preservation Officer and 96 CEG/CEVSH are notified and the area is further inspected.</p>	<p>There would be no significant impacts under Alternative 1. Because activities such as ground training, amphibious landing activities and surf zone testing have the potential to adversely affect cultural resources, coordination with 96 CEG/CEVSH would be required prior to any activities outside of currently approved test and training areas or above levels currently represented by the No Action Alternative.</p> <p>Cultural resources would be clearly marked and considered off limits. In the event of an inadvertent discovery, all training and testing would cease until Eglin's Base Historic Preservation Officer and 96 CEG/CEVSH are notified and the area is further inspected.</p>	<p>There would be no significant impacts under Alternative 2. Although increased activities have the potential to adversely affect cultural resources, coordination with 96 CEG/CEVSH would be required prior to any activities outside of currently approved test and training areas or above levels currently represented by the No Action Alternative.</p> <p>Cultural resources would be clearly marked and considered off limits. In the event of an inadvertent discovery, all training and testing would cease until Eglin's Base Historic Preservation Officer and 96 CEG/CEVSH are notified and the area is further inspected.</p>
Air quality	There would be no significant impacts under the No Action Alternative. Emissions due to missions would be minute compared with both the NAAQS and	There would be no significant impacts under Alternative 1. Emissions due to missions would be minute compared with both the NAAQS and county emissions standards. No adverse	There would be no significant impacts under Alternative 2. Emissions due to increased mission tempo would be minute compared with both the NAAQS and county

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	No Action Alternative	Alternative 1	Alternative 2
	county emissions. No adverse impacts would be expected to regional air quality.	impacts would be expected to regional air quality.	emissions. No adverse impacts would be expected to regional air quality.
Noise	There would be no significant impacts under the No Action Alternative to human receptors due to noise.	There would be no significant impacts under Alternative 1 to human receptors due to noise.	There would be no significant impacts under Alternative 2 to human receptors due to noise.
Safety/restricted access	There would be no significant impacts under the No Action Alternative. Standard safety procedures are in place that effectively excludes public access to test areas. The establishment of SDZs and safety footprints limit test area impacts. An effective UXO Management Plan ensures UXO hazards are mitigated with efficiency.	There would be no significant impacts under Alternative 1. The current level of expenditures and activities, including future activities, is managed effectively and safely through standard safety procedures, and the establishment of SDZs/safety footprints limiting test area impacts. An effective UXO Management Plan ensures UXO hazards are mitigated with efficiency and will continue to do so for future foreseeable activities.	There would be no significant impacts under Alternative 2. An increase in training and testing would also equate to a comparable increase in the military personnel involved. The increased manning would allow the standard safety procedures to continue despite the increased activity. Additionally, with additional personnel able to oversee and manage any UXO accountability, the UXO hazard would be mitigated.
Land use and recreation	No changes to land use would occur under the No Action Alternative and, therefore, there would be no impacts to land use. Eglin property along SRI that is open to the public for recreation could be closed or be classified as restricted access during testing and training missions. However, these closures are anticipated to be temporary and minor, since closures would only last for the duration of the activity and many other areas are available for recreational use.	No changes to land use would occur under Alternative 1 and therefore, there would be no impacts to land use. Any area along SRI that is controlled by Eglin could be closed or restricted to the public during testing and training activities. Under Alternative 1, an increase in testing and training activities could result in more frequent closures or restricted access times. However, impacts associated with closures to beach access and shoreline access are anticipated to be temporary and minor since closures would only last for the duration of the activity and many other areas are available for recreational use.	No changes to land use would occur under Alternative 2 and, therefore, there would be no impacts to land use. Any area along SRI that is controlled by Eglin could be closed or restricted to the public during testing and training activities. Under Alternative 2, an increase in testing and training activities could result in more frequent closures or restricted access times. However, impacts associated with closures to beach access and shoreline access are anticipated to be temporary and minor, since closures would only last for the duration of the activity and many other areas are available for recreational use.
Socioeconomics	Under the No Action Alternative, military testing and training would have a minor and temporary impact on fishing, boating, and other economic generating industries from restricted	Under Alternative 1, an increase in military testing and training would have a minor and temporary impact on fishing, boating, and other economic generating industries from restricted access or closures of	Under Alternative 2, a surge in testing and training missions above baseline conditions would result in more frequent testing and training activities above baseline levels. Therefore,

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	No Action Alternative	Alternative 1	Alternative 2
	<p>access or closures of certain areas. Impacts are anticipated to be minor and temporary and would be minimized by avoiding closures during weekends, tournaments, and holidays, which would affect a larger portion of the public.</p> <p>There are no disproportionate impacts to environmental justice concern areas. Okaloosa County and Santa Rosa County exceed the COC percentage of youth population.</p>	<p>certain areas. Impacts are anticipated to be minor and temporary and would be minimized by avoiding closures during weekends, tournaments, and holidays, which would affect a larger portion of the public.</p> <p>There are no disproportionate impacts to environmental justice concern areas. Okaloosa County and Santa Rosa County exceed the COC percentage of youth population.</p>	<p>potential impacts to socioeconomic resources would be similar to those as described for Alternative 1.</p> <p>There are no disproportionate impacts to environmental justice concern areas. Okaloosa County and Santa Rosa County exceed the COC percentage of youth population.</p>

COC = community of comparison; LCAC = landing craft air cushion; NAAQS = National Ambient Air Quality Standards; UXO = unexploded ordnance; SDZ = surface danger zone

2.4 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 2, which allows an increase in SRI operations over the current level of activity plus foreseeable future activities. Implementation of management actions would allow a surge in test and training activities while minimizing impacts to environmental and natural resources. Neither the No Action Alternative nor Alternative 1 is expected to be sufficient for the expected growth of testing and training activities at Eglin AFB over the next 10 years. Therefore, Alternative 2 was selected as the Preferred Alternative to adequately support potential testing and training requirements as they occur.

The need for additional management actions is driven by legislation, regulations, and policies that protect sensitive habitats, cultural resources, and threatened and endangered species (Appendix B). Legislation pertaining to sensitive habitats, sensitive species, and exotic species includes the Marine Mammal Protection Act; ESA; AFI 32-7064, *Integrated Natural Resources Management Plan*; Executive Order (EO) 11990, *Protection of Wetlands*; and EO 13112, *Invasive Species*. Regulations on treatment of threatened and endangered species, many of which are supported in sensitive habitats, will be further described in Section 3.4. 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.

Impacts to or from chemical materials, soils, water resources, biological resources, cultural resources, air quality, noise, safety, and socioeconomic resources are not considered significant under Alternative 2, with the implementation of management actions discussed in Chapter 4 and summarized in Section 2.5, Management Requirements. Long-term and cumulative impacts to the affected environment have not been identified under this alternative.

2.5 MANAGEMENT REQUIREMENTS

This REA was prepared with consideration that the following management requirements would be employed for all SRI missions. The proponents are responsible for ensuring these management activities are implemented. Management requirements provided below are taken from a variety of sources, including the 1997 SRI Environmental Baseline Document (EBD) (U.S. Air Force, 1997), 2005 SRI PEA (U.S. Air Force, 2005), 2005 SRI Programmatic Biological Assessment (U.S. Air Force, 2005a) and associated LOA (U.S. Air Force, 2005c), and 2006 SRI EBD (U.S. Air Force, 2006). Many of the requirements pertain to avoiding impacts to natural and cultural resources. Locations of these resources and a general description of the level of restriction are shown on Figure 2-3.

2.5.1 General Measures

The following measures apply to all mission activities.

- A restriction of a maximum of 140-decibel noise level leaving the Eglin Reservation boundary. An approximate calculation is 600 times the cube root of the NEW equals the distance in feet to the reservation boundary.
- No detonation can produce a seismic shock of more than 1 inch/sec peak particle velocity when reaching any structure. An approximate calculation is 60 times the square root of the NEW equals distance in feet to the structure.
- All inert weapons, which include practice bombs with spotting charge, on or near the surface are recovered, removed, and destroyed.
- Use of inert or target practice (TP) rounds of ordnance should always be considered.
- Live fire is restricted to designated areas. Blank ammunition use and pyrotechnics are permitted in designated areas. All activities are prohibited within cultural areas, piping plover critical habitat, and *Cladonia* sites. If an activity needs to be conducted within these areas, a separate consultation would be required.
- Follow regulations on debris and hazardous materials for cleanup. Cleanup of the test site debris and hazardous materials should be conducted according to regulations. Cleanup of debris is mandatory (as described in individual test directives).
- Wheeled vehicles would keep to existing trails/roads (described in individual test directives), unless there is special authority to use nonexisting trails/roads.
- All trenches must be filled immediately after use.
- The use of all pyrotechnic devices would be under the supervision of qualified personnel (described in individual test directives).
- Pyrotechnic devices that fail to ignite would not be disturbed, but they would be flagged. Explosive ordnance disposal (EOD) personnel would be notified for dud disposal (described in individual test directives).

- Coordinate planned use of pyrotechnics, explosives, or powerful munitions in the vicinity of restoration areas (sea turtle nesting/relocation sites) with Natural Resources Section.
- Areas in which small arms with blank ammunition are used would be policed for debris. Spent cartridges would be collected for recycling (described in individual test directives).
- Debris from air-dropped live ordnance would not occur in the marine portion of the ROI, since all live ordnance dropped into the Eglin Gulf Test and Training Range would normally be dropped beyond the 100-fathom line (approximately 30 miles from shore).
- Low-pressure sodium lights would be used, and all lights would be shielded from the beach and directed landward.
- Vehicle use in wetlands is prohibited. Troop maneuvers through wetlands should be avoided when possible. Currently designated wetlands are shown on Figure 2-3.
- Troop maneuvers would be avoided on established dunes higher than 5 feet as well as vegetated areas. Such dunes are identified by a clear change in elevation that would cause a modification in the way a person is moving (for example, switching from a walking motion to more of a climbing motion). These dunes are also typically vegetated. Established dunes and vegetated areas are to be avoided because they function as habitat for protected species, providing food and shelter. Damage to the vegetation may not only decrease its value as habitat, but can expose the underlying sand to wind and storms that eventually modify the entire dune by erosion. Vehicles and equipment would not be allowed in dune habitat due to the similar potential for vegetation damage and subsequent wind and storm erosion.
- Sea turtle nests would be avoided. Early-morning surveys are conducted daily during turtle nesting season (01 May through 31 October), and any nests observed are marked. Nesting habitat is considered to extend from the mean high water line to 200 feet inland. Depending on the nature of a mission, sea turtle nests may be either left in place and avoided or relocated.
- Several shorebird species occur on SRI at various locations and times of the year. During missions, critical habitat for piping plover would be avoided (Figure 2-3), as well as nests of other species, to ensure nesting birds are not disturbed. Shorebird surveys and monitoring is routinely conducted by 96 CEG/CEVSN personnel during the nesting season (15 March to 31 August), but these surveys are not comprehensive and all nests may not be located. Additional surveys may be required for specific missions (mission proponents would be responsible for costs of additional surveys and posting nest locations). Shorebird nests with the potential to be damaged or disturbed by mission activities must be marked and avoided.
- Areas restricted due to the presence of cultural resources are shown on Figure 2-3. Restrictions are not uniform throughout SRI but vary based on the specific location. Mission-specific requirements for activities occurring in restricted areas would be determined through coordination with Cultural Resources personnel (96 CEG/CEVSH).

- Any Native American or historic artifacts of any kind (e.g., arrowheads, pottery, bones, or old wreckage) encountered in the course of mission activity (or otherwise) should be left in place and reported as soon as possible to 96 CEG/CEVSH.
- Any mission action that may result in damage or substantial alteration to an existing structure (building, platform, tower, or other) is subject to the EIAP and requires submission of an Air Force 813 form.
- Adherence to LUCs (no digging or soil disturbance) and coordination with Eglin AFB's Environmental Restoration Section would be required for all testing and training exercises in the vicinity of the three areas designated as POI-405.
- Immediately notify the Environmental Restoration Section if mission personnel encounter soil that is discolored or has a chemical odor or unusual debris during any ground training operations.

2.5.2 Measures for A-15 Designated Training Area

- All general measures detailed above would apply to the A-15 Designated Training Area. During sea turtle and shorebird nesting seasons, surveys would be conducted daily by 96 CEG/CEVSN personnel and any nests located within the A-15 Designated Training Area would be either marked and avoided or relocated to other areas.

2.5.3 Measures for Surf Zone Detonations

Marine Mammals and Sea Turtles

The Air Force has no plans to conduct surf zone detonations, and this activity is not part of this EA. However, the Navy has evaluated underwater detonations, including surf zone detonations at SRI, in the NSWC PCD EIS/OEIS (U.S. Navy, 2009). Required mitigations, identified in the resulting consultation and Biological Opinion and LOA (NOAA, 2011; 2010), are summarized below. Please refer to the 2010 consultation documents for more detailed descriptions.

- No detonations over 34 kilograms (75 pounds) shall be conducted in territorial waters, except the line charge detonations, which is a series of 5-lb charges over 107 meters (350 feet), and totaling up to 1,750 lbs.
- Activities shall be coordinated through the Environmental Help Desk to allow potential concentrations of detonations in a particular area over a short time to be identified and avoided.
- Visual and aerial surveys will be carried out as specified. Any protected species sighted will be reported.
- Line charge tests shall not be conducted during the nighttime.
- Additional mitigation measures shall be determined through the NSWC PCD's environmental review process. Clearance zones must be determined based on the upper limit of different ranges of NEW.

- Monitoring and reporting measures shall be conducted according to requirements of the Navy’s 2010 LOA.

2.5.4 Measures for Live Fire Activities

Marine Mammals

- Live fire activities may require a separate MMPA consultation with NOAA Fisheries for impacts to marine mammals.
- Navy personnel would conduct LCAC live fire testing only under conditions of suitable visibility and sea state of 3 or less.
- Pre- and post-detonation monitoring would be conducted to survey the study area for marine mammals. If a marine mammal is sighted within the target or closely adjacent areas, the mission would be suspended until the area is clear.

Table 2-4. Sea State Scale for Marine Mammal Observation

Scale Number	Sea Conditions
0	Flat, calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0 to 33% of surface; 0.3- to 0.6-m (1- to 2-foot) waves
3	Whitecaps on 33 to 50% of surface; 0.6- to 0.9-m (2- to 3-foot) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9-m (3-foot) waves

m = meters

Sea Turtles

- Live fire activities may require a separate ESA consultation with NOAA Fisheries for impacts to sea turtles.
- During the period from 01 May through 31 October, nighttime live fire missions would be minimized whenever possible.
- During the period from 01 May through 31 October, an observer must be present to identify signs of sea turtle activity.
- During the period from 01 May through 31 October, if a sea turtle or hatchling were observed on the beach during live fire activities, all firing would cease and troops would remain quiet, allowing the turtle to continue activities.
- During the period from 01 May through 31 October, live fire activities would preferentially occur at areas from which nests had been relocated or where no nests occur.
- During the period from 01 May through 31 October, live fire testing would be conducted only under conditions of suitable visibility and sea state.
- Frangible or nonlead munitions would be used when possible.

Shorebirds

- Live fire activities may require a separate ESA consultation with NOAA Fisheries for impacts to threatened or endangered shorebirds.
- Eglin Natural Resources Section (NRS) would conduct a pre-mission survey for nesting shorebirds. If any nests or colonies of shorebirds are found within the project area, the nest would be clearly marked and avoided. A reasonable buffer around the nest would be established to protect the nest from disturbance.
- If the buffer area around the nest is encroaching on the mission area and cannot be avoided, Eglin NRS would determine if the buffer can be reduced while ensuring no impacts to the nest would occur.
- During the period from mid-July to mid-May, live fire would be minimized near piping plover critical habitat.
- During the period from mid-July to mid-May (the winter foraging period), live fire buffer zones would be established around known piping plover critical habitat (e.g., 150 meters for frangible munitions, 2,000 meters for standard munitions).
- During the period from mid-July to mid-May (the winter foraging period), live fire would be directed toward the Gulf.

2.5.5 Surface-to-Air Missile Testing

Sea Turtles

- No nighttime test events would occur during sea turtle season (01 May through 31 October).
- Active nests would be marked, and any hatchlings disoriented by setup activities would be redirected toward the shoreline by Eglin NRS personnel or designee(s). Only persons on Eglin's sea turtle permit would be allowed to interact with sea turtle adults or hatchlings. Persons not included on the permit who encounter a sea turtle would contact Eglin NRS.
- Missile launches requiring nighttime setup would avoid sea turtle season if possible.
- During sea turtle season, low-pressure sodium vapor lighting and light shields would be used, and all unnecessary nonmission or safety lights would be turned off.

2.5.6 Open-Air Hardware-in-the-Loop Tower Testing

Sea Turtles

- OA-HITL Tower night operations would be minimized during sea turtle nesting season (31 May through 31 August) when possible, especially during the peak nesting season for each sea turtle species (June and July).
- All lights on the tower, except aviation safety lights, will be turned off during sea turtle season (01 May through 31 October).

2.5.7 Personnel/Equipment Drops and Extractions

Sea Turtles

- Night personnel/equipment drops and extractions would be minimized during sea turtle season (from 01 May through 31 October), especially during the peak nesting season for each sea turtle species (June and July).
- From 01 May to 31 October, if surveys indicated a sea turtle nest within 200 feet of the primary extraction zone (PZ), another PZ would be used for that mission.

Shorebirds

- Eglin NRS would conduct a pre-mission survey for nesting shorebirds. If any nests or colonies of shorebirds are found within the project area, the nest would be clearly marked and avoided. A reasonable buffer around the nest would be established to protect the nest from disturbance.
- If the buffer area around the nest is encroaching on the mission area and cannot be avoided, Eglin NRS would determine if the buffer can be reduced while ensuring no impacts to the nest would occur.
- During the period from mid-July through mid-May, personnel/equipment drops and extractions would avoid known piping plover feeding areas.

2.5.8 Amphibious and Land-Based Activities

Sea Turtles

- During the period from 01 May through 31 August, if a sea turtle was observed on the beach during activities, personnel would remain quiet, allowing the turtle to continue her activities. All effort would be made not to obscure the turtle crawl or the nest area.
- During the period from 01 July through 31 October, if hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination. All effort would be made not to obscure the turtle crawls or the nest from where they emerged. Following completion of the activity, Eglin Natural Resources Section would be contacted to verify the nest hatching.
- Nighttime amphibious and land-based activities on the beachfront would be minimized when possible during sea turtle season.
- Between 01 May and 31 October, when activities would be conducted on the beach during the night, one participant would be designated as an observer to be responsible for identifying signs of nesting or hatchling sea turtles. The observer would be responsible for ensuring that the training participants do not interfere with nesting sea turtles, impede hatchling sea turtles from emerging from the nest and crawling to the Gulf of Mexico, or obscure signs of sea turtle activity.
- No daytime (sunrise to sunset) mission-related beachfront activities would begin before completion of daily sea turtle nest survey and protection measures (nest marking or

relocation) from 01 May to 31 October, unless approved through a Section 7 consultation.

- All known sea turtle nests would be marked and protected in accordance with established Eglin Natural Resources Section protocol so that they could be easily identified by vehicle operators and troops. An additional 10-foot boundary would be marked around all nests occurring within the action area using reflective tape.
- During nighttime activities on the beach, an Eglin Natural Resources Section observer would be stationed at each nest that was at or past incubation day 60. In the event that the nest hatched, the observer would be required to coordinate with the training/testing participants to ensure that the hatchling has unimpeded access to the water.
- For nighttime activities conducted on the beach between 01 May and 31 October, a one-time nesting survey would be conducted 2 hours prior to the start of the activity on the portion of the beach where the activity would occur. All nests located during surveys at night would be marked and protected (or relocated where approved) before the nighttime activity begins.
- Vehicle operators would remain alert at all times to the potential presence of sea turtles on the beach.
- Vehicle operators and troops would avoid marked sea turtle nests by at least 50 feet.
- Vehicles would traverse the beachfront as close to the waterline as possible and below the waterline when possible.
- Vehicular movement would remain at least 50 feet below the primary dune line.
- Fighting holes, trench systems, vehicle or equipment traps, artillery bunkers, etc., would be refilled and leveled after the activity is finished.
- To the extent practicable, vehicles and watercraft would be staged at water's edge. Whenever it is necessary to stage vehicles, watercraft, or set up equipment on the beachfront, silt screens would be installed around the base of the vehicles/craft/equipment and removed immediately following the operation. If a vehicle is left on the beach for more than one night, then a surveyor would be present to ensure that no turtles become entrapped.
- Eglin military and civilian personnel would be notified that, upon locating a sea turtle adult, hatchling, or egg that has been harmed or destroyed, contact must be made with the Eglin Natural Resources Section.
- Daily morning sea turtle nest surveys would continue to be conducted between 1 May and 1 September in accordance with established index nesting beach survey and Eglin Natural Resources Section protocol. Frequency of hatching and emerging success monitoring after 1 September would have to involve checking nests daily until the last nest has either hatched or reached 80 days incubation, at which time the nest would be evaluated per state protocol.
- All ruts deeper than 2 inches would be removed prior to sunset during sea turtle hatching season. All such ruts created during night operations would be removed immediately following operation completion.

- All holes or disturbed areas 2 feet or larger in diameter created as a result of vehicle or watercraft movement would be refilled immediately after the exercise is over.
- To the extent practicable, lighting associated with mission activities would be minimized through reduction, shielding, lowering, and appropriate placement of lights to prevent the glowing portion of any luminaries (including lamp, globe, or reflector) from being directly visible from anywhere on the beach.
- Personnel conducting work, including driving and/or operating equipment on or adjacent to the beach, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights and lighting on equipment at night.
- The size of vehicular movement corridors would be limited to the minimum necessary for the mission.
- *Sargassum* mats (weed lines) in the water would be avoided.
- Landing and movement corridors would be marked so as to be easily distinguished by the operators of amphibious landing vehicles/craft and other vehicles.
- Vehicles would remain on existing roads whenever possible.
- Sand dunes greater than five feet high and large sea oat clumps would be avoided by troop and vehicular traffic.
- LCACs would avoid vegetated areas to the greatest extent practical and would vary their paths within the designated crossover corridor.
- Amphibious Assault Vehicle (AAV) and LCAC use within maneuver areas would be restricted to daylight hours during sea turtle season.
- LCAC and AAV maneuver/training activities would preferentially occur at areas from which nests have been relocated or where no nests occur. Coordination with Natural Resources would be necessary to ensure that no nests are located within the maneuver area prior to AAV/LCAC use.
- A sea turtle nest relocation program would be implemented in areas where amphibious landings would be conducted between 01 May and 31 October. Eglin Natural Resources Section must be notified at least 80 days prior to the action.

Shorebirds

- Eglin NRS would conduct a pre-mission survey for nesting shorebirds. If any nests or colonies of shorebirds are found within the project area, the nest would be clearly marked and avoided. A reasonable buffer around the nest would be established to protect the nest from disturbance.
- If the buffer area around the nest is encroaching on the mission area and cannot be avoided, Eglin NRS would determine if the buffer can be reduced while ensuring no impacts to the nest would occur.
- Amphibious and land-based activities would be minimized during the winter foraging period near piping plover critical habitat.
- Amphibious and land-based activities would be restricted in piping plover critical habitat.

Perforate Lichen

- Troop and vehicle maneuvers through locations of the perforate lichen would be prohibited.
- Ground testing would be restricted near lichen populations.

Invasive Species

- Vehicle/equipment access in untreated areas with known invasive plant problems would be restricted.
- When possible, vehicles/equipment would be washed before transport onto the island.
- Vehicles would be kept on established roads when possible to avoid spread of invasive plants.
- Access corridors from roads to beach would be designated and periodically monitored for invasive species.
- Selection of native species for any new plantings on the island would be coordinated with the Natural Resources Section.
- Sources of construction material and fill dirt would be screened to ensure that no invasive plants were present.
- Only certified weed-free vegetative material (e.g., hay bales, pine straw) would be used if brought in from off the island.

2.5.9 Small Boat Obscurant Testing***Marine Mammals***

- Overflight of area by aircraft prior to testing to ascertain that marine mammals, large fish, and turtles are not in a critical area.

Sea Turtles

- Use of small boats at night would be minimized when possible during sea turtle nesting season, especially during the peak nesting season for each sea turtle species (June and July).
- *Sargassum* mats would be avoided.
- Testing would not be performed during turtle nesting season (01 May through 31 October). Nesting shorebirds would also benefit from this mitigation.
- Operational activities would only occur on concrete or asphalt hardstand areas.

Personnel

- No personnel would be allowed in safety exclusionary zone during testing.

2.5.10 Watercraft Traffic

- Shipwreck offshore of A-11 would be avoided.
- Shipwreck east of A-15A would be avoided.

3. AFFECTED ENVIRONMENT

This chapter describes the receptors within the SRI ROI that are potentially impacted by testing and training operations. This chapter is organized according to the following resources: chemical materials, soils, water resources, biological resources, cultural resources, air quality, noise, safety/restricted access, land use and recreation, and socioeconomics.

3.1 CHEMICAL MATERIALS/DEBRIS

3.1.1 Definition of the Resource

Chemical materials encompass liquid, solid, or gaseous substances released to the environment as a result of mission activities. These materials would include munitions and pyrotechnic combustion byproducts from items such as smokes and flares. Release of these materials may potentially affect air quality, water quality, soils, and sediments. The environmental analysis of chemical materials describes the potentially adverse environmental impacts from testing and training activities within SRI.

Hazardous Materials

The Resource Conservation and Recovery Act (RCRA), Section 6903(5), defines hazardous waste 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.” Hazardous waste 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 hazardous waste to be transported, stored, and used on-site under the Proposed Action consists of fuels, munitions, and pyrotechnics.

3.1.2 Existing Conditions

Eglin AFB has implemented its *Hazardous Waste Management Plan*, AAC Instruction 32-7003, that identifies hazardous waste generation areas and addresses the proper packaging, labeling, storage, and handling of hazardous wastes. 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, 2006a). Procedures and responsibilities for responding to a hazardous waste spill or other incident are also described in the Eglin AFB *Spill Prevention, Control, and Countermeasures (SPCC) Plan* (U.S. Air Force, 2005b).

Releases to the environment from munitions utilized in proficiency and qualification training must be reported to the U.S. Environmental Protection Agency (USEPA) under the Emergency Planning and Community Right-to-Know Act (EPCRA) Toxic Release Inventory (TRI) program. Training is subject to a TRI reporting threshold of 10,000 pounds per year for most common chemicals, with lower reporting thresholds for chemicals classified as persistent bio-accumulative toxic (PBT). 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 submit a “Form R” report to the USEPA the quantity of munitions-related waste released to the environment or recovered and recycled.

Eglin AFB has procedures in place to comply with TRI reporting requirements and would track ordnance use associated with the Proposed Action. New procedures may be required 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 hazardous materials is regulated in accordance with the Hazardous Materials Transportation Act, 49 U.S. Code (USC) 1801 et seq. For the transportation of hazardous materials, Florida has adopted federal regulations that implement the Hazardous Materials Transportation Act, found at 49 CFR 105-180.

State laws pertaining to hazardous materials management include the Florida Right-to-Know Act, Florida Statutes Title 17, Chapter 252, the Hazardous Waste section of the FDEP and the Florida Department of Transportation (FDOT) Motor Carrier Compliance Department that implements 49 CFR 178 under Florida Statute annotated Title 29, Section 403.721.

AFI 32-7086 Supplement 1, *Hazardous Materials Management*, describes how Eglin 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 deposited on the surface of terrestrial or aquatic environments during mission activities. Potential impacts are primarily related to physical disturbances to people, wildlife, or other users of the range, rather than the chemical alterations that could result from the residual materials. Examples of debris potentially deposited include shell casings, canisters from signal smokes, flares and chutes from flares, unexploded ordnance, and miscellaneous litter and refuse from missions involving ground troop movement.

Environmental Restoration Program Sites

DoD initiated the Environmental Restoration Program (ERP) to investigate environmental contamination that may be present at DoD facilities as a result of past management or disposal of potentially hazardous materials. Regulations affecting ERP management at Eglin AFB integrate investigative and remedial protocols of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and RCRA processes. Eglin AFB holds a RCRA Part B Permit. FDEP oversees the RCRA Corrective Action Program in Florida. In 2001, FDEP issued Eglin AFB a RCRA Corrective Action Permit outlining requirements.

Several closed ERP sites occur on SRI (Figure 3-1), which are described in the 2006 Environmental Baseline Document (EBD) (U.S. Air Force, 2006) and in Appendix B of Revision 1 of the Eglin Environmental Restoration Program Sites Status Report (U.S. Air Force, 2009). ERP site POI-405, which consists of three separate areas (Figure 3-1), has an internal land use control restricting any soil disturbance in those areas.

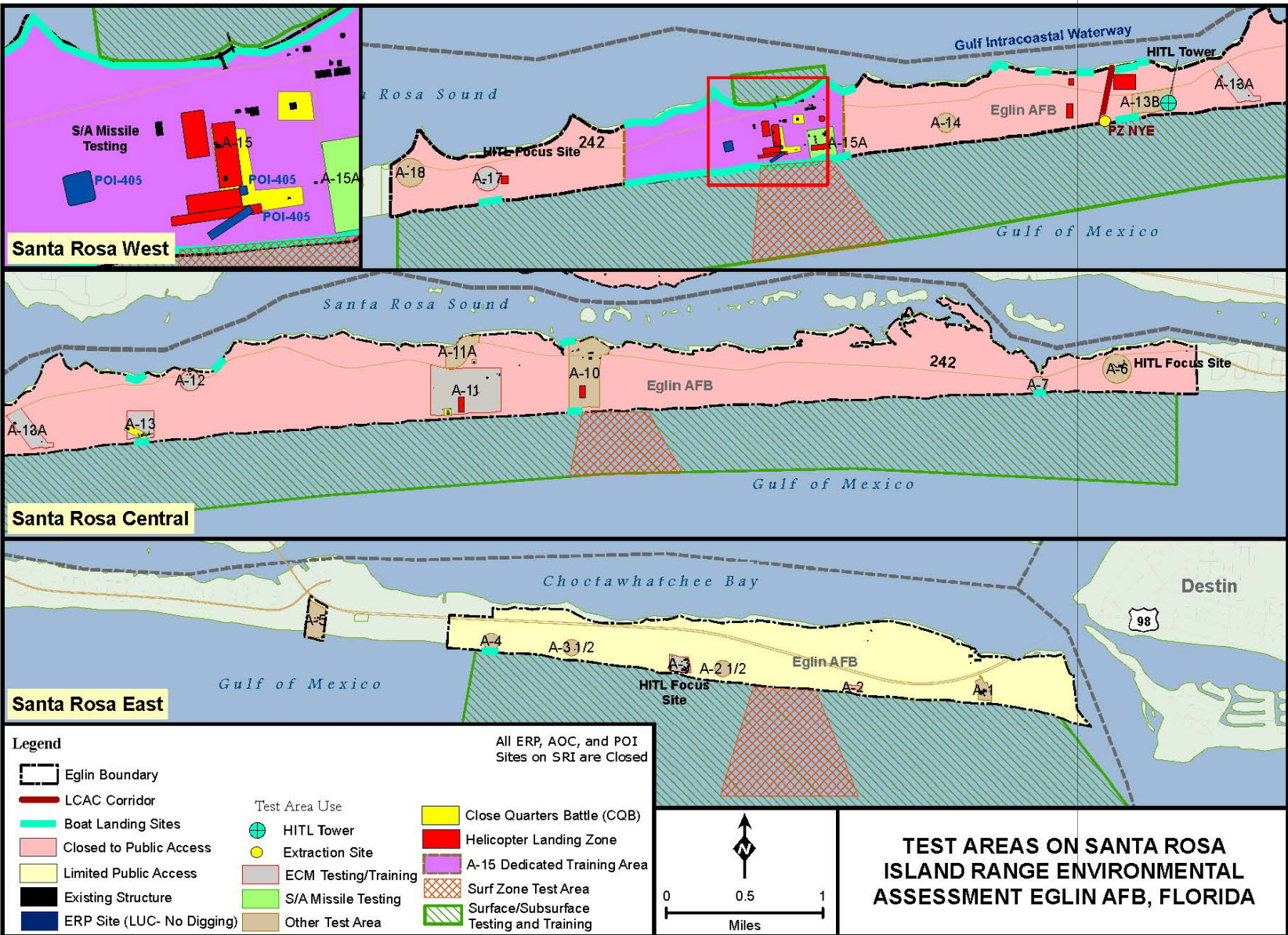


Figure 3-1. ERP Sites on Santa Rosa Island

3.2 SOILS

3.2.1 Definition of the Resource

Soil and sediment resources include the potentially affected terrestrial (land) soils and marine sediments within the ROI. A description of terrestrial and marine landforms, soil and sediment types and characteristics, transport mechanisms, and topography is provided in the following subsections.

3.2.2 Existing Conditions

Terrestrial Soil

SRI is considered a barrier island complex, having the typical landforms of beaches, coastal dunes, interior dunes, and low-lying soundside beaches and marshes (Figure 3-2) (Chafin and Schotz, 1995). Gulf beaches vary in width and are relatively flat with gentle slopes. Beach sands vary from unsorted, mixed grain sizes and shells at the surf zone to finely graded and well sorted grains on dunes. The coarse deposits found on the Gulf side are well oxygenated due to tidal flushing and large interstitial (between sand grains) spaces (Wolfe and Reidenauer, 1988).

Coastal dunes roughly parallel the Gulf beach, elevated 3 to five feet above the high tide line. They exist in a high-energy environment of wind and wave activity and, therefore, are continually changing. Coastal dunes consist of primary and secondary dunes. Primary dunes are located closer to the shoreline and are subject to the greatest wind and wave forces. The more stable secondary dunes occur landward of the primary dunes. Sands from primary dunes are periodically eroded and redeposited during times of high- and low-energy wave action. Exposure to salt, waves, and wind limit the vegetation found on primary dunes.

Interior dunes occur inland of the primary and secondary coastal dunes. Interior dunes are comparatively older, more vegetated, and more stable. Gradual trapping of wind-blown sands by the vegetation sometimes allows these dunes to build up to several meters (m) in height. The interior dunes are usually aligned north to south from the effects of dominant southeast summer winds.

Interior island depressions are prominent features of the soil-landscape interface that strongly influence the geomorphology and botanical features of SRI's terrestrial environments. Depressions represent landscape sink areas that function as collection reservoirs for surface runoff and groundwater seepage. Water tends to remain within these features for extended periods of time. Two types of depressions that occur within the SRI ROI include muck and sand depressions.

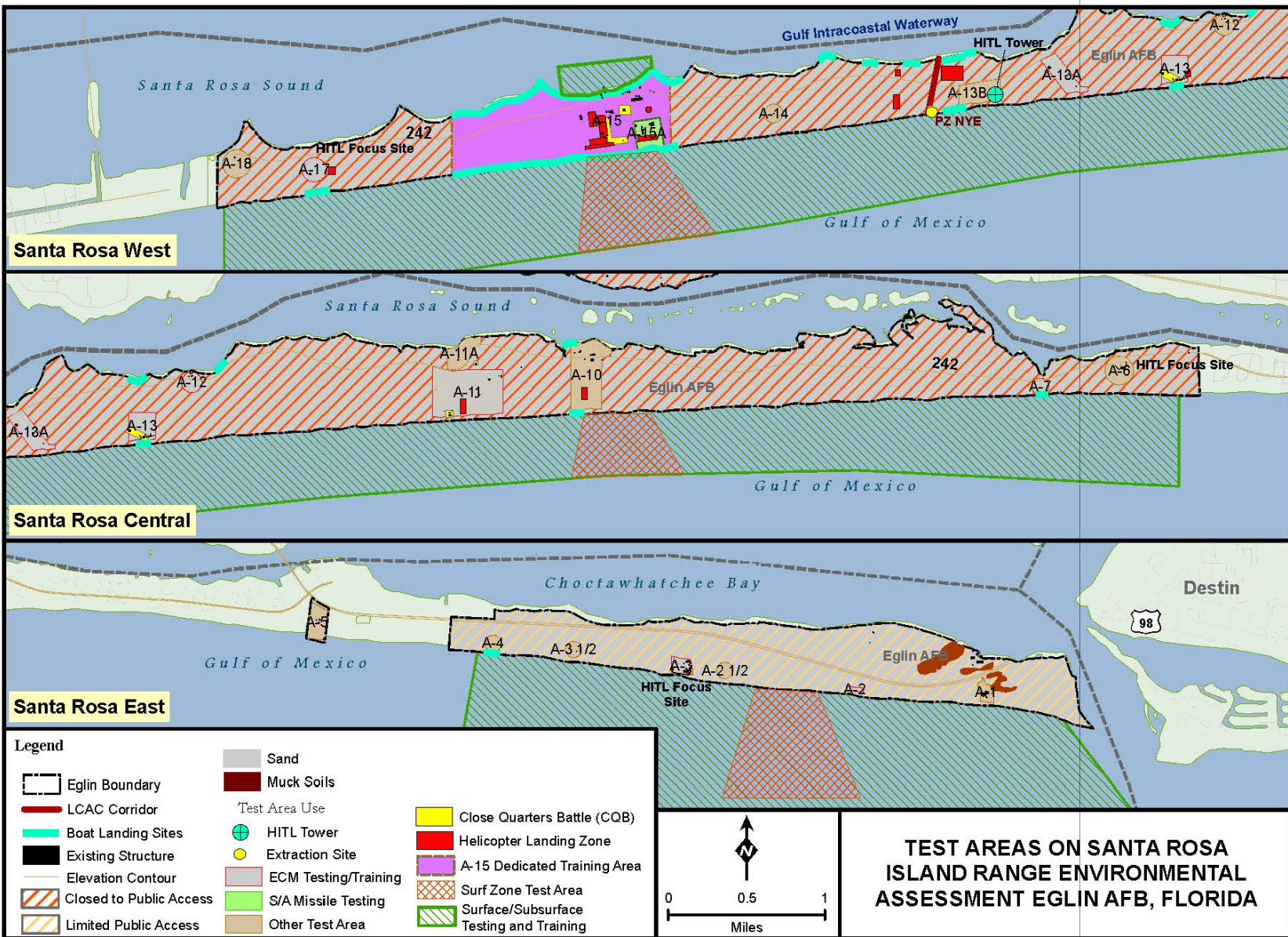


Figure 3-2. Soil Types Within Santa Rosa Island

SRI’s sandy landscapes are dynamic environments subject to drastic changes in physical condition, community structure, and ecosystem functioning. Tropical storms and hurricanes frequent these coasts; resulting forces of wind and water consistently destroy and rebuild the island’s morphology and ecosystems. In extreme cases, so much sand may be eroded from beaches that ancient tree stumps are exposed. As an example, severe overwashing of SRI during Hurricane Opal (1995) reduced sand dunes from an average of 5 to 1.5 meters in height. Greater than 95 percent of the eroded beach-dune overwash sediments were deposited on the island interior and along the bay shoreline; in some instances, the bay shoreline was extended by more than 100 meters. Morphological changes to the barrier island were generally governed by an erosion-deposition process that moved sediments from one side of the island to the other.

Terrestrial Soil Classifications

Soils are classified according to the U.S. Department of Agriculture’s National Cooperative Soil Survey classification, which includes soil order, suborder, great group, subgroup, family, and series. Soil orders are the most general classification, providing very broad soil information on a small spatial scale, whereas soil series provide detailed data on a large spatial scale including series descriptions, taxonomic class, typical soil horizons, range of characteristics, geographic setting, drainage, soil water, vegetation and other features. Soil series provide trends and range of conditions common to a soil. Although soil series descriptions provide a fine level of detail, a range of variability may occur for site-specific soils. The soil series within the SRI ROI are shown in Figure 3-2, with soil classification and characteristics described in Table 3-1.

Table 3-1. Santa Rosa Island Soil Characteristics

Soil Type	Soil Depth (approx. inches)	Texture	Slope (%)	pH	Organic Matter (%)	Clay (%)	Permeability (inches/hour)
Beaches	0 – 60	Sand, fine sand	0 – 5	---	<1	<1	>6
Newhan-Corolla	0 – 80	Sand, fine sand	0 – 5	3.6 – 7.8	<0.5	0 – 3	>20
Rutlege sand	0 – 80	Dark gray sand	<1	3.6 – 5.5	3 – 9	2 – 10	6.0 – 20
Duckston sand	0 – 50	Light brown sand	<1	3.6 – 8.4	0.5 – 3	0 – 4	>20
Dorovan muck	0 – 80	Grayish brown muck	<2	3.6 – 4.4	20 – 80	---	0.6 – 2.0

Source: U.S. Air Force, 2006

Gulf of Mexico sandy materials are the principal constituents of the SRI soil environment. Sandy soils characteristically contain 70 percent or greater sand-size particles; many of the sandy soils on SRI have average sand contents greater than 95 percent. The unique combination of almost pure sand texture, low water- and nutrient-holding capacity, high soil infiltration and hydrologic conductivity, and high rainfall has resulted in a landscape of excessively drained, potentially highly leached, low fertility, poorly structured soil with low biodegradation potential.

Generally, SRI’s sandy soils are loose and uncoated throughout their profile, particularly the Newhan–Corolla Complex soils. Coating of sand grains by materials such as organic matter or iron/aluminum oxides can form cemented sand layers or hardpans that tend to restrict soil permeability and root penetration. Based on U.S. Department of Agriculture, NRCS soil survey data for the proposed project area (Weeks et al., 1980; Overing and Watts, 1989; and Overing et al., 1995), these naturally occurring horizons are likely not found on SRI.

The moisture content of soil horizons varies seasonally; a soil may be continuously moist in all or some horizons throughout the year or for part of the year. At SRI, soil moisture is a primary limiting factor that determines the form and function of ecosystems. Changes in soil moisture can alter the vegetation composition of ecosystems and, subsequently, the availability of wildlife habitats. Patterns of soil moisture within sand dunes can be irregular and vary dramatically, even in extremely dry conditions.

Marine Sediments

Offshore topography is relatively flat and consists primarily of sand. Sediments may be categorized in three zones: coastal beach and dune, intertidal swash, and the nearshore. The beach system sediments consist of medium-grained sand with minor amounts of carbonate material. Generally, the native sand is described as white with slight color variations in localized areas. The direction of the longshore transport is generally from east to west. The sandy substrate of the intertidal swash zone provides habitat for benthic organisms and faunal communities characterized by low species diversity. The nearshore zone consists of two distinct longshore sandbars. For Florida panhandle beaches, the first and second sandbars are typically located approximately 50 to 80 feet and 425 to 460 feet offshore (Wolfe and Reidenauer, 1988). These sandbars and associated troughs provide habitat for a diverse benthic community; the amount of silt and calcium carbonate in sediments largely influence which types of species are found within a given community.

Further offshore, the sediment composition within the Gulf of Mexico varies from the regions of the shelf to the slope to the deep seafloor. The Gulf is a marginal ocean basin with a typical oceanic crust that is covered with sediments approximately 10 kilometers (km) thick. The average accumulation rate of sediment is 10 centimeters (cm) per 1,000 years.

3.3 WATER RESOURCES

This subsection describes the water resources within the SRI ROI. Water resources include surface water, subsurface water, wetlands, floodplains, and the coastal zone.

3.3.1 Definition of the Resource

Surface Water

Surface water is any water that lies above groundwater, such as ponds and streams. Ponds and wetlands occur where local shallow clay and silt layers restrict the downward movement of water to the regional water table (U.S. Air Force, 2006).

Water Quality

Section 303 of the Clean Water Act requires states to establish water quality standards for waterways, identify those that fail to meet the standards, and take action to clean up these waterways. Florida has adopted the Impaired Waters Rule (IWR) (Chapter 62-303, Florida Administrative Code [FAC]), with amendments, as the methodology for assessing the state's waters for 303(d) listing. Waters determined to be impaired are submitted to the USEPA for

approval as Florida's 303(d) list. FDEP submits updates to Florida's 303(d) List of Impaired Surface Waters to USEPA every 2 years. The *2006 Integrated Water Quality Assessment for Florida: 2006 305(b) Report and 303(d) List Update* (FDEP, 2006a) satisfies the listing and reporting requirements of Sections 303(d) and 305(b) of the Clean Water Act. Impaired waters near SRI include Boggy Bayou, Poquito Bayou, Rocky Bayou State Park, Choctawhatchee Bay, East Bay, and Yellow River (FDEP, 2006b and FDEP, 2007).

Turbidity

Turbidity is defined as a decrease in water clarity due to fine silt and clay particles in suspension. The nephelometric turbidity unit (NTU) is the legal standard for measuring turbidity. The state of Florida's standard for coastal water turbidity is 29 NTUs. Turbidity throughout the Gulf varies with depth, distance from shore, and season. Waves, tides, internal waves, seiches (standing waves) resuspending bottom sediments, and biological events (such as phytoplankton blooms) may cause fluctuations in turbidity. Turbidity decreases from nearshore to offshore as the influence of waves and tides decreases. Bottom turbidities tend to be higher due to the proximity of currents to the sediments.

Waves and Tides

Waves usually result from wind or geological effects and may travel large distances before striking land. Waves range from small ripples to huge tsunamis. There is little actual forward motion of individual water particles in a wave, despite the large amount of energy and momentum it may carry forward. Tides are very long period waves that move through the oceans in response to the gravitational forces exerted by the moon and sun. Tides cause changes in the depth of the marine and estuarine water bodies and produce oscillating currents known as tidal streams. Prediction of tides can be pertinent to coastal navigation and other coastal activities. Waves and tides greatly impact the physical and biological environments of a coastal area, shaping land mass and habitats.

Subsurface Waters

The water table is generally defined as the upper surface of the saturated (wet) zone of subsurface soil. Fluctuations of the water table over time are highly dependent on the balance between rainfall and evapotranspiration. Water tables are extremely dynamic features and exhibit wide and diverse fluctuations. Seasonal fluctuations may exceed several feet depending on the type of soil. Generally, well-drained soils have shorter periods of high water table levels and longer periods of low water table levels relative to poorly drained soils. Potential wetland soils such as Dorovan, Duckston, and Rutlege generally have a seasonal high water table less than 1 foot from the surface. Generally, the water table tends to move in the direction of maximum slope.

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 affect soil formation and development, as well as the plant and animal communities found in wetland areas (USEPA, 1995). Wetlands are often 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 ground water 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 United States are described using three principal wetland delineation criteria: hydrophytic vegetation, hydric soils, and hydrology (USACE, 1987). The U.S. Fish and Wildlife Service (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 (NMFS) 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, riprap, 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.

Wetlands support both aquatic and terrestrial organisms. Large varieties of microbes, vegetation, insects, amphibians, reptiles, birds, fish, and mammals can be found living in wetland ecosystems. Through a combination of high nutrient levels, fluctuations in water depth, and primary productivity of plant life, wetlands provide the basis for a complex food web, which supports the foraging habits of these animals for part of or all of their life cycle. During migration and breeding, many bird and mammal species also rely on wetlands for food, water, and shelter.

Floodplains

Floodplains are lowland areas adjacent to surface water bodies (e.g., lakes, wetlands, and rivers) that are periodically covered by water during flooding events. Floodplains 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 cleanup 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). 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 and integrity of the nation's remaining wetland resources.

Coastal Zone

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

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, which 11 state agencies and four of the five water management districts administer.

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 E).

3.3.2 Existing Conditions

Surface Water

There are brackish ponds and many other small wetlands on SRI, but no natural surface fresh water bodies. After heavy rainfall, the ponds may become fresh for brief periods. No well-developed drainages exist, but numerous coves and inlets may be found along the northern edge of SRI. Depending on topography, surface water either drains into Choctawhatchee Bay, Santa Rosa Sound, or the Gulf of Mexico.

Water Quality

Although there are no streams on SRI, water from SRI does drain into the Gulf of Mexico, Choctawhatchee Bay, and Santa Rosa Sound. All waters in the Gulf of Mexico, Choctawhatchee Bay, and Santa Rosa Sound are defined as Class III (recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife), and portions of the sound and bay are also classified as Class II (shellfish propagation or harvesting). The Gulf of Mexico along the beach of SRI is considered impaired for mercury in fish, and Choctawhatchee Bay and Santa Rosa Sound is considered impaired for fecal coliforms and mercury in fish (FDEP, 2006a and 2007).

Turbidity

In water quality testing conducted between 1996 and 2003, turbidity in Choctawhatchee Bay and the eastern portion of Santa Rosa Sound (just to the north of SRI) tended to range between 0 and 7 NTUs. Actions undertaken in Class III waters must not exceed the Florida state standard of 29 NTUs above background level.

Waves and Tides

Tides within the SRI region are diurnal (twice daily) and microtidal (of small range). The mean tide range at East Pass is 0.43 meters, with a spring tidal range of 0.51 meters. According to the Wave Information Study of the Waterways Experiment Station, USACE, the mean significant wave height for offshore Okaloosa County is 3.3 feet and the mean wave period is 8.5 seconds. The most frequent wave direction is out of the east-southeast (U.S. Air Force, 2005). There are several widely varying estimates of longshore sediment transport for this area. Most estimates range from 52,000 to 254,000 cubic yards per year. All estimates indicate that the net transport is to the west, which is supported by the physical pattern of erosion west of the inlet and accretion east of the inlet (U.S. Air Force, 2005).

Subsurface Waters

Newhan–Corolla complex soils, which make up the majority of soils on SRI, typically have a relatively shallow water table with a seasonal high water table that averages less than three feet below the surface. Typically, the height of the subsurface water table fluctuates with cycles in seasonal rainfall and through daily Gulf tide cycles.

Wetlands

Wetlands occur on many areas of SRI (Figure 3-3). Due to the dynamic nature of the SRI physical environment and the effects of storm surge, wetlands may shift or become covered with sand in relatively short time periods. Several types of wetlands may occur on SRI, including:

- Estuarine wetlands
- Salt marshes
- Inland wetlands
- Basin wetlands
- Depression marshes
- Freshwater marshes

The salt marsh community is found wherever tidal salt waters have frequent access and where the direct wave action is limited. This community consists of small fringes along the northwestern margin of SRI and occurs in narrow bands along the littoral (intertidal) areas of the island. Tree and shrub species are limited and usually consist of sea myrtle, wax myrtle, and sea oxeye. Herbaceous species include sawgrass, black needle rush, and salt marsh mallow. Soils associated with this community are level, poorly drained muck or sandy clay loams underlain by loamy sand.

The majority of the wetlands on SRI are inland wetlands, which can be categorized as basin wetlands, depression marshes, and freshwater marshes. All of these wetland types have similar characteristics. They are characterized as shallow, closed basins with outlets present usually only in times of high water. They are composed of peat or sand substrate, are usually inundated, and exhibit woody or herbaceous wetland vegetation.

The depression marshes total more than 90 percent of the wetlands found on SRI. Depression marshes are shallow, generally ephemeral (seasonal), rounded depressions. These wetlands are dominated by plants adapted to anaerobic substrate conditions imposed by saturation or inundation for more than 10 percent of the growing season. Peaty soil accumulates in the deepest sections where water is most permanent. Herbaceous vegetation is often found in this plant community in concentric bands (or zones).

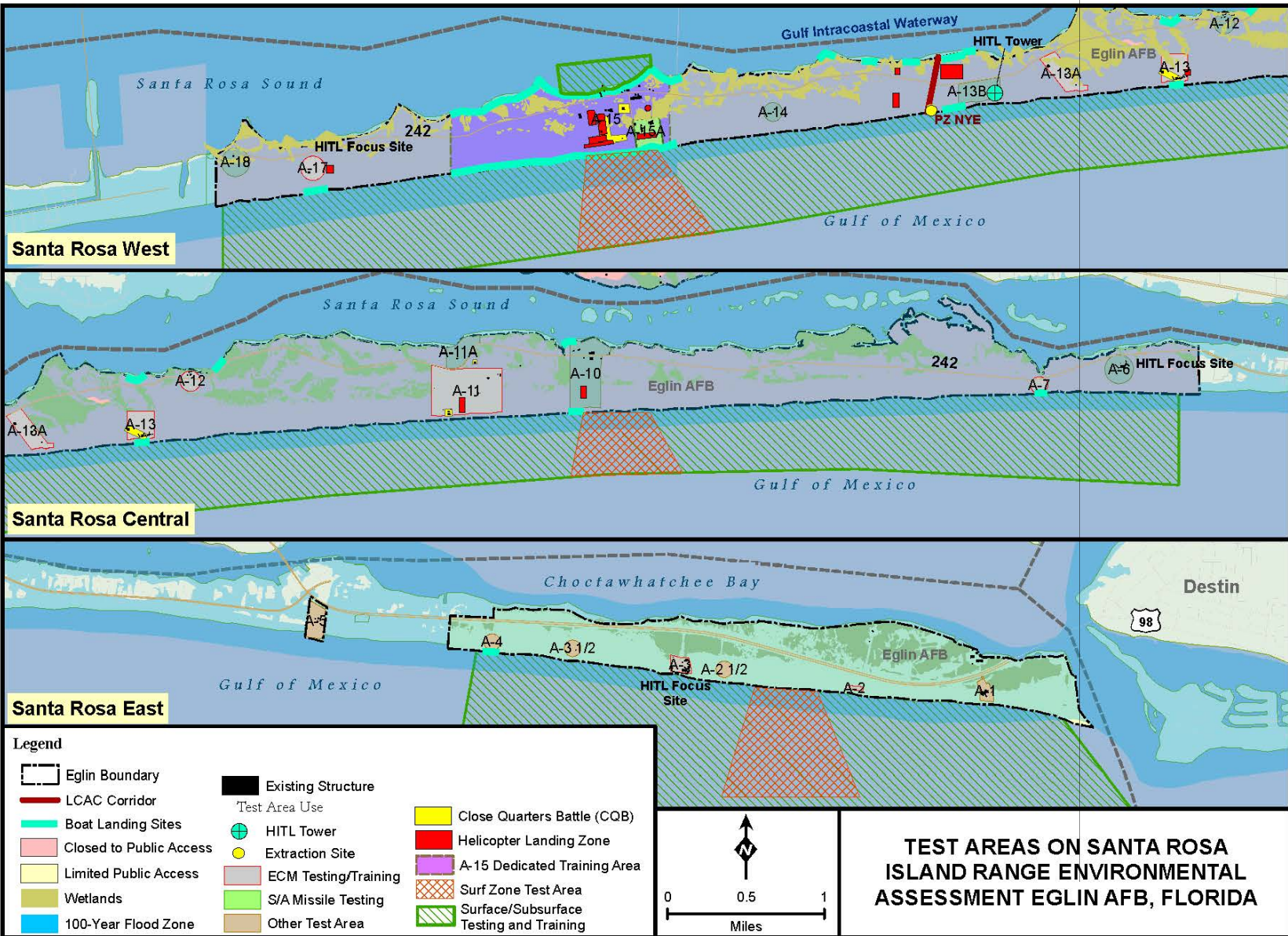


Figure 3-3. Wetlands and Floodplains on Santa Rosa Island

Some small, isolated freshwater marshes occur on SRI. These wetlands are usually found in low troughs and swales behind the dune lines. Tree and shrub species are generally absent but may be found adjacent to the marshes. The vegetative community consists mostly of grasses, sedges, rushes, and other herbaceous plants. Maidencane and breakrushes are the dominant plant species present. Soils are nearly level and are very poorly drained.

Floodplains

The 100-year floodplain on SRI is shown on Figure 3-3. All of the SRI Range Complex is within a special flood hazard area. The Gulf coast, including the SRI Range Complex, is also designated as FEMA Zone V (a FEMA flood insurance rate zone corresponding to coastal floodplains subject to hazards from storm waves).

3.4 BIOLOGICAL RESOURCES

This section describes the biological resources found on the terrestrial habitats of SRI, as well as aquatic species that may occur within the SRI surf zone. Biological resources include the native and non-native species found on and near Eglin AFB SRI property. Several sensitive species and habitats occur in the habitats of SRI and the Gulf of Mexico surf zone.

3.4.1 Definition of the Resource

Terrestrial Resources

Terrestrial biological resources include plant and animal species found in upland areas, as well as the habitats that support these species. Some terrestrial habitats are considered to be sensitive to human disturbance. Sensitive habitat includes areas that the federal government, state government, or the DoD have identified for special protection due to certain characteristics such as the presence of rare or vulnerable species. Sensitive habitats on the terrestrial portion of SRI include piping plover critical habitat, shorebird nesting areas, outstanding natural areas and significant botanical sites (which consist of the entire island), and high quality natural communities (Figure 3-4), as well as wetlands and the floodplain. Wetlands and floodplains are addressed in Section 3.3. Sensitive habitats within the Gulf of Mexico surf zone include Gulf sturgeon critical habitat, and essential fish habitat (EFH). Descriptions of these habitats are provided in Section 3.4.2.

Sensitive species are those species protected under federal or state law (see Appendix C), and include migratory birds and threatened and endangered species. 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. Appendix C provides additional detail on the natural history of sensitive species potentially affected by the Proposed Action.

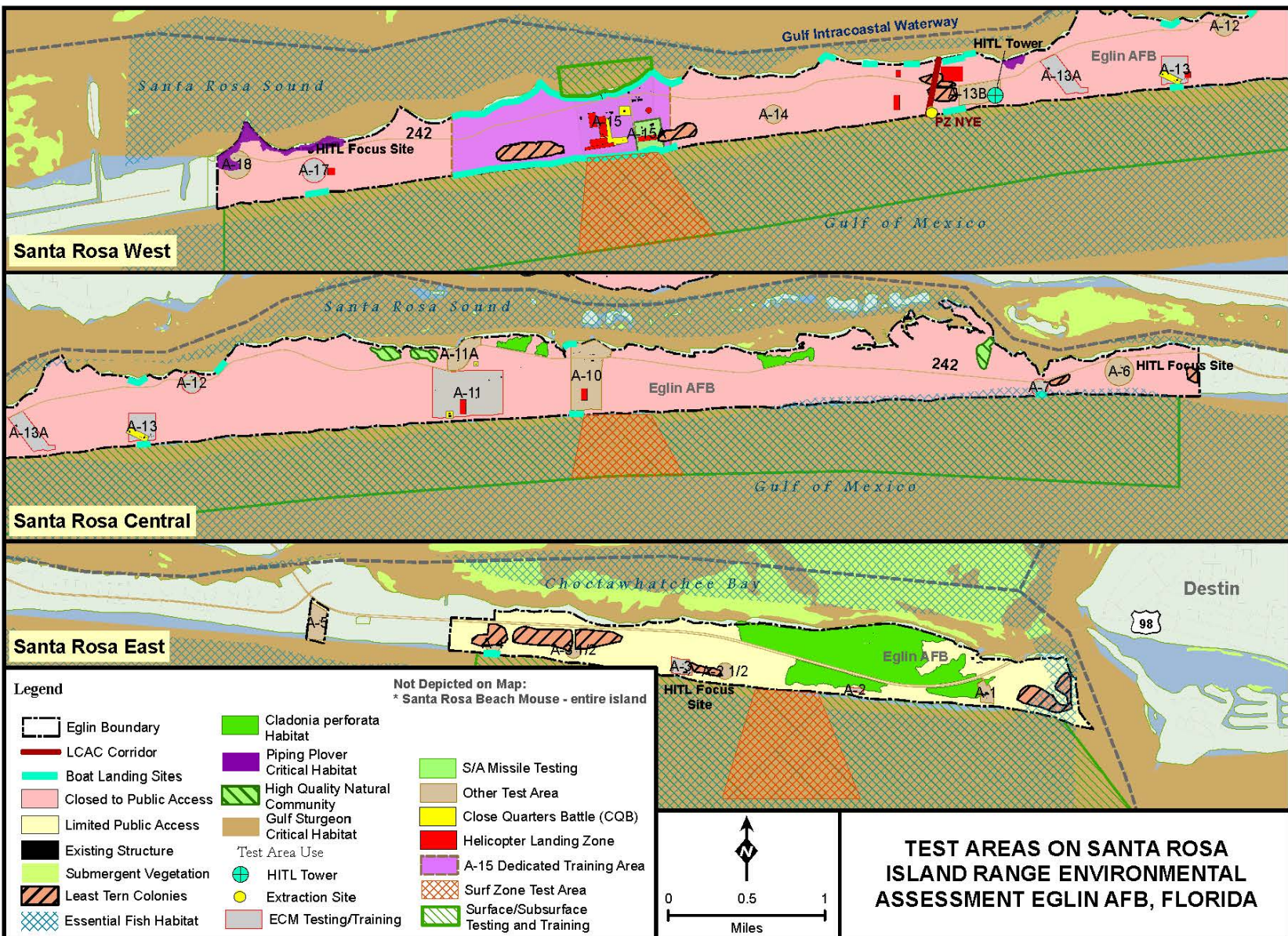


Figure 3-4. Sensitive Habitats and Species on Santa Rosa Island

The ESA (16 USC 1531 to 1544) was enacted to provide for the conservation of endangered and threatened species and the ecosystems on which they depend. Air Force Policy Directive 32-70 directs the implementation of the ESA. Certain federal activities may require an ESA Section 7 consultation with the USFWS and/or the NMFS.

AFI 32-7064 provides instructions on managing natural resources in such a way as to comply with federal, state, and local laws and regulations. This AFI calls for the protection and conservation of state-listed species when not in direct conflict with the military mission. Eglin AFB applies for appropriate permits for actions that may affect state-listed species (such as monitoring and handling) and also cooperates with the Florida Fish and Wildlife Conservation Commission (FWC) to further the goals of the Florida State Wildlife Conservation Strategy.

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 USC 703-712) and EO 13186. A migratory bird is defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. Federal agencies are to integrate bird conservation principles, measures, and practices into agency activities, and avoid or minimize adverse impacts on migratory bird resources. Also, federal agencies must provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds.

Invasive non-native species are species introduced from other countries or regions of the U.S. that threaten native plants and animals by altering the composition, structure, and function of native ecosystems. Invasive non-native species may impose large economic costs on natural resource managers, requiring intensive and extensive management to prevent undesirable ecosystem changes. EO 13112 states that each federal agency whose actions may affect the status of invasive species shall:

- Prevent the introduction of invasive species.
- Detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner.
- Monitor invasive species populations accurately and reliably.
- Provide for the restoration of native species and habitat conditions in ecosystems that have been invaded.
- Conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control.
- Promote public education on invasive species.

EO 13112 states that no federal agency shall authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive non-native species in the U.S. or elsewhere. A list of invasive species found on Eglin AFB is provided in Appendix C.

Marine Biological Resources

Marine biological resources include vertebrates and invertebrates that live in the water column and in sediments of the intertidal and nearshore environments. Vertebrates are animals with a

spinal column, such as fish and dolphins. Invertebrates do not have a spinal column and include crustaceans (crabs, shrimp), mollusks (clams, snails), and coelenterates (jellyfish, corals). The intertidal area is the zone of beach face characterized by exposure to waves and surf. It is intermittently dry and wet depending on wave action, seasons, and tides. The nearshore environment includes the benthos (or bottom) habitats and the pelagic (or water column) environment. ESA-protected species occurring in marine habitats and potentially affected by the Proposed Action include sea turtles and the Gulf sturgeon. Critical habitat for the sturgeon is designated within the ROI. The Atlantic bottlenose dolphin and Atlantic spotted dolphin also occur in the nearshore Gulf and are protected under the Marine Mammal Protection Act (MMPA) of 1972. Impacts to EFH for managed marine fish species must be evaluated under the Magnuson–Stevens Fishery Conservation and Management Act (see Section 3.4.2).

The MMPA establishes a comprehensive federal plan to conserve marine mammals. The central feature of the MMPA is a moratorium on the “taking” of all marine mammals. This broad prohibition applies to all marine mammals, not just those deemed to be threatened or endangered. The term “take” is defined by the MMPA as to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Although the MMPA establishes a moratorium on the taking of marine mammals in U.S. waters by any person and by U.S. citizens in international waters, certain activities are exempted from the moratorium as outlined in Sections 101 and 104. The category pertinent to Eglin AFB is that of incidental take during nonfishery activities (Section 101). An authorization is required to participate in such a designated activity. These authorizations are known as Letters of Authorization. If the take would consist of harassment only, an Incidental Harassment Authorization (IHA) may be issued.

3.4.2 Existing Condition

Terrestrial Biological Resources

Barrier Island Ecological Association

A classification system using ecological associations has been developed for the Eglin Range based on flora, fauna, and geophysical characteristics. These ecological associations are described in the *Integrated Natural Resources Management Plan* (U.S. Air Force, 2007). SRI falls under the barrier island ecological association, and its entire terrestrial area is classified as coastal upland community. This community is associated with sand beaches, beach dunes, coastal grassland, coastal interdunal swales, mesic flatwoods, and scrub communities. Common plant species are listed in Table 3-2.

Table 3-2. Plant Species Commonly Found in the Barrier Island Ecological Association

Beach Dune		Coastal Interdunal Swale	
Sea oats	<i>Unicola paniculata</i>	Centalla	<i>Centalla asiatica</i>
Sea rocket	<i>Cakile constricta</i>	Umbrellagrass	<i>Fuirena scirpoidea</i>
Beach elder	<i>Iva imbricata</i>	Beakrush	<i>Rhynchospora</i> sp.
Evening primrose	<i>Oenothera humifosa</i>	Elliot's yellow-eyed grass	<i>Xyris elliotii</i>
Milk pea	<i>Galactia microphylla</i>	Club moss	<i>Lycopodium appressum</i>
Godfrey's goldenaster	<i>Chrysopsis freyi</i>	Sawgrass	<i>Clamadium jamaicense</i>
Seashore paspalum	<i>Paspalum distichum</i>	White-topped sedge	<i>Dichromena colorata</i>
Beach cordgrass	<i>Spartina patens</i>	Ludwigia	<i>Ludwigia alata</i>
Beach morning glory	<i>Ipomoea stolonifera</i>	Nutrush	<i>Scleria verticillata</i>
Bitter panicum	<i>Panicum amarum</i>	Seashore paspalum	<i>Paspalum distichum</i>
Mesic Flatwoods		Gulf cordgrass	<i>Spartina spartinae</i>
Cabbage palms	<i>Sabal palmetto</i>	Marsh elder	<i>Iva frutescens</i>
Slash pine	<i>Pinus ellioti</i>	Muhly grass	<i>Muhlenbergia capillaris</i>
Willow	<i>Salix floridana</i>	Beach cordgrass	<i>Spartina patens</i>
Sawgrass	<i>Clamadium jamaicense</i>	Saltbush	<i>Baccharis halimifolia</i>
Vines	<i>Vitis munsoniana</i>	Sand pine	<i>Pinus clausa</i>
Vines	<i>Mikania cordifolia</i>	Sand live oak	<i>Quercus geminata</i>
Shrub	<i>Myrica cerifera</i>	Lichen	<i>Cladonia leporina</i>
Yaupon holly	<i>Ilex vomitoria</i>	Perforate lichen	<i>Cladonia perforata</i>
Fetterbush	<i>Lyonia lucida</i>	Spoon-leaved sundew	<i>Drosera intermedia</i>
Gallberry	<i>Ilex glabra</i>	Maritime Hammock	
Wicky	<i>Kalmia hirsuta</i>	Live oaks	<i>Quercus virginiana</i>
Mint	<i>Conradina canescens</i>	Cabbage palms	<i>Sabal palmetto</i>
Lichens	<i>C. leporina</i> and <i>C. perforata</i>	Magnolia	<i>Magnolia grandiflora</i>
Scrub		Buchthorn	<i>Bumelia reclinata</i> , <i>B. lanuginosa</i>
Rosemary	<i>Ceratiola ericoides</i>	Wild olive	<i>Ilex vomitoria</i>
Saw palmetto	<i>Serenoa repens</i>	Yaupon holly	<i>Osmanthus americanus</i>
Slash pine	<i>Pinus ellioti</i>	Red cedar	<i>Juniperus silicicola</i>
Scrub oaks	<i>Quercus geminata</i> , <i>Q. myrtifolia</i>	Saw palmetto	<i>Serenoa repens</i>
Lichens	<i>Cladonia leporina</i> , <i>Cladina evansii</i>	Scrub oak	<i>Quercus geminate</i>
Woody goldenrod	<i>Chrysoma pauciflosculosa</i>	Soapberry	<i>Sapindus marginatus</i>

Source: U.S. Air Force, 2006

Sensitive Species and Critical Habitat

A number of terrestrial sensitive species occur on Eglin AFB SRI property (Table 3-3). Additional information on sensitive species is available in Appendix C. Sea turtles spend much of their time in marine environments but come ashore to nest. Because the Proposed Action includes beach environments, sea turtles are discussed in this section and analyzed in Chapter 4 as both a terrestrial and a marine species. Sea turtle species shown in Table 3-3 have been documented to nest on SRI. The hawksbill sea turtle, which does not nest on SRI but may occur in the Gulf, is mentioned below under “Marine Biological Resources.”

Table 3-3. Terrestrial Endangered, Threatened, and Rare Flora and Fauna on SRI, Eglin AFB

Scientific Name	Common Name	Status
Reptiles		
<i>Caretta caretta</i>	Loggerhead sea turtle	FT, ST
<i>Chelonia mydas</i>	Green sea turtle	FE, SE
<i>Dermochelys coriacea</i>	Leatherback sea turtle	FE, SE
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle	FE, SE
Birds		
<i>Charadrius alexandrinus</i>	Snowy plover	ST, FC
<i>Charadrius melodus</i>	Piping plover	FT, ST
<i>Egretta caerulea</i>	Little blue heron	SSC
<i>Egretta thula</i>	Snowy egret	SSC
<i>Egretta tricolor</i>	Tricolor heron	SSC
<i>Eudocimus albus</i>	White ibis	SSC
<i>Rynchops niger</i>	Black skimmer	SSC
<i>Sterna antillarum</i>	Least tern	ST
Mammals		
<i>Peromyscus polionotus leucocephalus</i>	Santa Rosa beach mouse	CT
Plants		
<i>Cladonia perforata</i>	Florida perforate lichen	FE, SE, CT
<i>Drosera intermedia</i>	Spoon-leaved Sundew	ST

FE = federally endangered, FT = federally threatened, FC = federal candidate, CT = Eglin AFB/The Nature Conservancy conservation target, SE = state endangered, ST = state threatened, SSC = state species of special concern

The Eglin portion of SRI includes critical habitat for one federally listed threatened species, the piping plover (Figure 3-4). The ESA defines critical habitat as specific areas within or outside the geographical area occupied by the listed species that contain physical or biological features essential to the species' conservation and that may require special management considerations or protection. Critical habitat designation for wintering and breeding grounds for the piping plover was published in the Federal Register on 10 July 2001. On SRI, critical habitat for over-wintering piping plovers is located on the north shore, near Test Site (TS) A-18. Critical habitat at the site includes land from the mean lower low water line to where densely vegetated habitat, not used by the piping plover, begins and where the constituent elements no longer occur. Along the Gulf coast areas, piping plovers are known to forage in areas of wet sand such as wash zones and intertidal ocean beachfronts, in addition to wrack lines, washover passes, mud and sand flats, ephemeral ponds, and salt marshes. They are also known to use adjacent areas for sheltering in dunes, debris, and sparse vegetation. Areas used by piping plovers are ephemeral habitats; when surveys document new locations being used, these areas may be given the same protection afforded the piping plover critical habitat units already established.

Invasive Non-Native Species

Invasive non-native plant species have been documented at multiple locations on SRI. These species have the potential to out-compete and overtake native plant communities, degrade threatened and endangered species habitat, and alter natural processes such as the hydrology of wetlands. Chinese tallow, cogon grass, and torpedo grass have been prioritized as the greatest threats to SRI because of their current abundance, dispersal mechanisms, and documented historical presence. Coyotes, red fox, feral cats, fire ants, and cactus moths are nonnative

invasive animal species known to inhabit SRI. Additional information on invasive nonnative animal and plant species is available in Appendix C.

Marine Biological Resources

Intertidal Zone

Various testing and training activities may occur within the surf zone. The beach and surf zone areas are subject to high-energy forces of waves and wind, and species living within these areas are adapted to the stresses of this environment. The natural movement of sand within this region follows seasonal patterns, with sand moving offshore in the winter and returning in the spring and summer. Intertidal zone species populations are also seasonal, decreasing in the winter and achieving a maximum in the summer. Wolfe et al. (1988) described the physical features and species common to the sand beach intertidal habitat of the Florida panhandle. Sediment grain size in the intertidal zone ranged from 0.1 to 0.2 mm. Sediments were well oxygenated due to large pore spaces and wave action. These features allow organisms to burrow relatively deeply to escape heavy surf. Intertidal zone organisms tend to be suspension feeders, obtaining plankton or detritus suspended in the surf.

Species found in the intertidal zone include polychaete worms, coquina clams (*Donax* sp.), amphipod and isopod crustaceans (beach hoppers or sand fleas), and ghost crabs (*Ocypode quadrata*). Fish and predatory birds feed on the smaller organisms of this zone. Among intertidal organisms, polychaetes are numerically dominant, although amphipods and ghost crabs are more visible. Common Gulf sand beach species are listed in Table 3-4.

Table 3-4. Common Species of the Gulf Sand Beach Communities

Species Name	Common Name
<i>Emerita talpoida</i>	Mole crab
<i>Callianassa islagrande</i>	Burrowing shrimp
<i>Arenaeus cribrarius</i>	Portunid crab
<i>Scolelepsis squamata</i>	Polychaete worm
<i>Donax</i> sp.	Coquina clam
<i>Haustorius</i> spp.	Beach flea
<i>Ocypode quadrata</i>	Ghost crab

Source: Wolfe et al., 1988

Ross et al. (1987) studied seasonal and daily variations in occurrence of fish and invertebrates in a Gulf of Mexico intertidal zone. Six species represent approximately 90 percent of the total sampled. Summer was the period of highest numbers and biomass. Selected species sampled with a seine net are listed in Table 3-5.

Nearshore Environment

The nearshore environment includes the benthos and the pelagic environment. The following descriptions of northern Gulf of Mexico benthos were obtained from the MMS-sponsored Mississippi, Alabama, Florida (MAFLA) OCS Baseline Environmental Surveys (Dames and Moore, 1979).

Table 3-5. Species Sampled From a Gulf Surf Zone

Species Name	Common Name
<i>Harengula jaguana</i> *	Sardine
<i>Anchoa hepsetus</i> *	Striped anchovy
<i>Anchoa mitchelli</i> *	Bay anchovy
<i>Callinectes sapidus</i> *	Blue crab
<i>Anchoa nasuta</i> *	Longnose anchovy
<i>Menticirrhus littoralis</i> *	Gulf whiting
<i>Mugil cephalus</i>	Striped mullet
<i>Archosargus probatocephalus</i>	Sheepshead
<i>Arius felis</i>	Hardhead catfish
<i>Chaetodipterus faber</i>	Atlantic spadefish
<i>Dasyatis sayi</i>	Bluntnose stingray
<i>Lagodon rhomboids</i>	Pinfish
<i>Caranx hippos</i>	Jack crevalle
<i>Trachinotus carolinus</i>	Pompano
<i>Menidia beryllina</i>	Tidewater silverside
<i>Menida peninsulae</i>	Tidewater silverside

Source: Ross et al., 1987

*most abundant species collected

Benthos

Benthic invertebrates include the infauna (animals living in the substrate), such as burrowing worms and mollusks, and the epifauna (animals that live on the substrate), such as mollusks, crustaceans, hydroids, sponges, and echinoderms. Benthic habitats, or substrates, of the northeastern Gulf of Mexico consists of soft, sandy or muddy bottoms which support more infaunal invertebrates, such as polychaetes. Benthic organisms constitute an important food source for fish, shorebirds, and larger invertebrate species like crabs and shrimp. Benthic habitats experience natural fluctuations in distribution and composition. For this reason, it is sometimes difficult to assess the degree of change attributed to man-made disturbance (ASMFC, 2002). Table 3-6 lists representative epifaunal species from the nearshore benthos.

Infaunal invertebrates are grouped by size, with near-microscopic species composing the meiofauna and larger species comprising the macroinfauna. Nematode worms and small crustaceans called copepods make up the majority of the meiofauna found in sandy habitats (Dames and Moore, 1979). The densities of the meiofauna, which ranged from 65 per 10 square centimeters (cm²) to 3,752 per cm² in the Dames and Moore study, were observed to be higher in areas closer to shore.

The dominant macroinfauna groups in the Gulf of Mexico include polychaete worms, crustaceans, and mollusks. The highest concentrations of these species occur inshore and decrease as depth increases. Density is dependent on sediment grain size. The higher densities of macroinfauna are associated with coarse-to-medium sediment and grain size. Fewer numbers and different kinds of species are observed in finer sediments and silt. Dames and Moore (1979) observed the highest density and diversity at the 20- and 40-meter water depths out of all depths sampled (20 meters, 40 meters, 100 meters, and 200 meters).

Table 3-6. Representative Nearshore Epifaunal Species

Dominant Species	Species Type
<i>Chlamys benedicti</i>	Clam
<i>Laevicardium pictum</i>	Clam
<i>Sicyonia brevirostris</i>	Shrimp
<i>Solenocera atlantidis</i>	Shrimp
<i>Scyllarus chacei</i>	Slipper lobster
<i>Pylopagurus coralinus</i>	Hermit crab
<i>Palicus alternata</i>	Crab
<i>Luidia clathrata</i>	Starfish
<i>Ophiolepis elegans</i>	Brittle star

Source: Dames and Moore, 1979

Pelagic Environment

The nearshore pelagic environment consists of the plankton community and the nekton community. Plankton is free-floating plants and animals varying in size from microscopic to several meters long. Nektons are free-swimming animals.

Plankton Community

Ocean currents dominate plankton movement and distribution. Plankton distribution is highly variable, characterized by spatial patchiness, as well as seasonal and interannual variations. Bacterioplankton, phytoplankton, and zooplankton are described in this section, although smaller plankton such as nanoplankton and picoplankton also exist. The smallest group described here, the bacterioplankton, include bacteria and blue-green algae which absorb nutrients from the water column to feed. Phytoplankton are single-celled plants that absorb nutrients and perform photosynthesis (converting light energy to food). Phytoplankton carbon production is the primary source of food in the trophic web of marine ecosystems.

Zooplankton includes free-floating animals that feed on phytoplankton and other zooplankton species or, in the case of larger zooplankton such as jellyfish, small free-swimming organisms. The zooplankton represents a production level secondary to phytoplankton that provides an important link between phytoplankton and higher trophic levels such as fish and marine mammals.

Fish

Fishes of the eastern Gulf inhabit all areas of the water column. Benthic and reef fishes live near the sea floor and around artificial or natural reef systems. Typical fish species associated with bottom habitats include triggerfish, toadfish, flounder, stingrays, snappers, grunts, and groupers.

Pelagic fishes, which spend most of their lives in the open waters of the Gulf, make seasonal, latitudinal (east to west) migrations along the west coast of Florida. These migrations are triggered by seasonal changes in temperature, movement of their food resources, and spawning behavior.

Cobia and king and Spanish mackerels leave their wintering areas in south Florida to move northward in the spring along the continental shelf. Both species spawn over the continental shelf from northwestern Florida to the northwestern Gulf off Texas. The shallow portion of the continental shelf at the high-nutrient areas near river plumes is likely used for nursery areas (MMS, 1990 and 1990a). Table 3-7 lists some pelagic fish species that occur within the nearshore waters of the project area. In the surf zone and nearshore areas, the highest number of fish species and largest populations are observed in the summer and early fall.

Table 3-7. Typical Pelagic Fishes Found in the Eastern Gulf

Scientific Name	Common Name
<i>Carangidae</i>	Jacks
<i>Clupeidae</i>	Herrings, menhaden
<i>Coryphaenidae</i>	Dolphinfish
<i>Mugilidae</i>	Mulletts
<i>Pomatomidae</i>	Bluefishes
<i>Rachycentridae</i>	Cobia
<i>Scombridae</i>	Mackerels, bonito

Protected Species and Critical Habitat

The nearshore environment off of SRI is utilized by many threatened, endangered, and special-status species. Many of these are federally listed species under the ESA (Table 3-8). Five species of sea turtles (Atlantic green, Atlantic loggerhead, Kemp’s ridley, hawksbill, and leatherback) and one marine mammal species, the West Indian manatee, are included in that number. Additional information on these species is provided in Appendix C. Manatees are not considered common in the ROI but may occur in the surf zone and estuarine waters. Two species of dolphins within the ROI are protected under the MMPA. Fish include the Gulf sturgeon, which occurs in Gulf and adjacent estuarine waters. The USFWS has designated critical habitat for the Gulf sturgeon, which includes northern Gulf of Mexico estuaries and extends 1 nautical mile out into the Gulf. Another listed fish species, the small-tooth sawfish, historically occurred within the study area but is currently considered to be restricted to the southern Florida peninsula. The smalltooth sawfish is therefore not considered further in this REA. Appendix C provides additional detail on marine protected species and Gulf sturgeon critical habitat.

Essential Fish Habitat

The Magnuson–Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to assess potential impacts to EFH for NMFS managed commercial fisheries. In accordance with the MSA, any federal action that has the potential to adversely affect EFH requires consultation with NMFS. As defined in Section 3 of the MSA, “fish” includes finfish, mollusks, crustaceans, and all other forms of marine animal and plant life, other than marine mammals and birds. EFH is defined as those waters and substrate necessary for fish spawning, feeding, or growth to maturity. Various types of communities, including diverse physical and biological features, are considered EFH. EFH communities range from naturally occurring hard-bottom areas and artificial reefs to floating mats of *Sargassum* algae.

Table 3-8. Federally Listed Threatened and Endangered Species Within SRI Nearshore Waters

Species		Federal Status
Scientific Name	Common Name	
Reptiles		
<i>Caretta caretta</i>	Atlantic loggerhead turtle	T
<i>Chelonia mydas</i>	Atlantic green turtle	E
<i>Dermochelys coriacea</i>	Leatherback turtle	E
<i>Lepidochelys kempii</i>	Kemp’s ridley turtle	E
<i>Eretmochelys imbricata</i>	Hawksbill turtle	E
Fish		
<i>Acipenser oxyrhynchus desotoi</i>	Gulf sturgeon	T
Marine Mammals		
<i>Trichechus manatus</i> ¹	West Indian manatee	E, MMPA
<i>Tursiops truncatus</i>	Atlantic bottlenose dolphin	MMPA
<i>Stenella frontalis</i>	Atlantic spotted dolphin	MMPA

E = endangered; T= threatened; MMPA = Marine Mammal Protection Act

1. Rarely sighted

Habitat utilized by a species can change with life history stage, abundance of the species and competition from other species, and environmental variability in time and space. The type of habitat available, its attributes, and its functions are important to species productivity and societal benefits. Some potential threats to habitat include certain fishing practices, marina construction, navigation projects, dredging, alteration of freshwater input into estuaries, and runoff.

The Gulf of Mexico Fishery Management Council identified and described EFH for all life stages of 26 species within the northern Gulf of Mexico. Table 3-9 lists managed species and their habitat by life stage.

Table 3-9. Essential Fish Habitat for Managed Species Adjacent to the Region of Influence

Species	Life Stages	Habitat
Stone crab	Juvenile	Shell, SAV
	Adult	Shell, SAV
Black grouper	Juvenile	Estuarine and Gulf of Mexico
Gag grouper	Juvenile	SAV and oyster beds in lagoons and estuaries
Gray snapper	Postlarvae/juvenile	SAV, mud
	Adult	SAV, sand, mud
Lane snapper	Juvenile	SAV, sand, mud
	Adult	Reefs, sand 0 – 130 m
Red drum	Post larvae/juvenile	SAV, estuarine
	Subadult	Estuarine, mud bottoms, oyster reefs
	Adult	Mud bottoms, oyster reefs
Red grouper	Juvenile	Hard bottom, SAV, reefs
Red snapper	Larvae	Structure
	Postlarvae/juvenile	Structure
Spanish mackerel	Juvenile	Estuarine
Yellowtail snapper	Juvenile	SAV, sand, mud

In addition to establishing EFH, the MSA also directs the identification of habitat areas of particular concern (HAPCs). HAPCs are subsets of EFH that are rare, especially ecologically important, particularly susceptible to human-induced degradation, or located in environmentally stressed areas (50 CFR 600.815(a)(8)). HAPCs typically include high-value intertidal and estuarine habitats, offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning, and rearing of fish and shellfish.

3.5 CULTURAL RESOURCES

3.5.1 Definition of the Resource

As a federal agency, Eglin AFB is legally required to consider the effects its actions may have on historic properties. These requirements are considered under AFI 32-7065 (U.S. Air Force, 2004), which addresses requirements of the NHPA of 1966 as amended. The NHPA of 1966 was enacted to set federal policy for managing and protecting significant historic properties. Federal agencies must identify historic properties and consult with the Advisory Council on Historic Preservation and SHPO (U.S. Air Force, 2004). Section 106 of the NHPA requires that federal agencies analyze the impacts of federal activities on historic properties, or cultural resources included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Section 110 of the NHPA requires that federal agencies inventory any cultural resources located on their property or within their control and to nominate those found to be significant for inclusion into the National Register.

Cultural resources consist of prehistoric and historic districts, 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. They include archaeological resources (both prehistoric and historic), historic architectural resources, American Indian sacred sites, and traditional cultural properties. Historic properties (as defined in 36 CFR 60.4 and 36 CFR 800.15(l)(1)) are significant archaeological, architectural, or traditional resources defined as either eligible or ineligible for listing in the NRHP. Under the NHPA, Eglin AFB is required to consider the effects of its undertakings on historic properties listed or eligible for listing in the NRHP. NHPA obligations for a federal agency are independent from NEPA and must be complied with even when an environmental document is not required. A 2003 Programmatic Agreement between the AAC, Eglin AFB, Advisory Council on Historic Preservation, and SHPO governing the treatment of historic properties states that adverse effects should be assessed by the AAC and 96 CEG/CEVSH per 36 CFR 800.6 (U.S. Air Force, 2003b).

In 1999, the DoD published its American Indian and Alaska Native Policy, superseded in 2006 by DoD Instruction 4710.02, that emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires that before decisions are made, an assessment be conducted through consultation of the effects of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands.

NAGPRA protects Native American burial sites and controls the removal of human remains, funerary objects, sacred objects, and items of cultural patrimony on federal and tribal lands. Historic properties, as defined under 36 CFR 800, include properties of traditional religious and cultural importance to tribes.

Survey Efforts and Section 106 Coordination for Santa Rosa Island

To date, the Air Force has completed 13 archaeological surveys covering all of SRI. A timeline of completed consulting activities regarding cultural resource work on SRI is presented in Table 3-10 below.

Table 3-10. Consultation Timeline for SRI

Communication From/To	Date	Type/Reference#	Topic of Communication
Air Force to SHPO	05 August 04	Letter DHR 2004-7657- on file 96 CEG/CEVSH	Survey of X-688
SHPO to Air Force	01 September 04	Letter DHR 2004-7657 – on file 96 CEG/CEVSH	Concurrence regarding X-688 survey results and findings
Air Force to SHPO	12 November 04	Letter DHR 2004-11019- on file 96 CEG/CEVSH	Survey of X-692
SHPO to Air Force	02 December 04	Letter DHR 2004-11019 – on file 96 CEG/CEVSH	Concurrence regarding X-692 survey results and findings
Air Force to SHPO	06 April 05	Letter DHR 2005-3603- on file 96 CEG/CEVSH	Survey of X-691
SHPO to Air Force	27 April 05	Letter DHR 2005-3603 – on file 96 CEG/CEVSH	Concurrence regarding X-691 survey results and findings
Air Force to SHPO	21 April 05	Letter DHR 2005-4053- on file 96 CEG/CEVSH	Survey of X-689
SHPO to Air Force	06 May 05	Letter DHR 2005-4053 – on file 96 CEG/CEVSH	Concurrence regarding X-689 survey results and findings
Air Force to SHPO	05 May 05	Letter DHR 2005-4666- on file 96 CEG/CEVSH	Survey of X-690
SHPO to Air Force	19 May 05	Letter DHR 2005-4666 – on file 96 CEG/CEVSH	Concurrence regarding X-690 survey results and findings
Air Force to SHPO	05 May 05	Letter DHR 2005-4665- on file 96 CEG/CEVSH	Survey of X-693
SHPO to Air Force	19 May 05	Letter DHR 2005-4665 – on file 96 CEG/CEVSH	Concurrence regarding X-693 survey results and findings
Air Force to SHPO	13 September 05	Letter DHR 2005-9426 – on file 96 CEG/CEVSH	Survey of X-694
SHPO to Air Force	10 October 05	Letter DHR 2005-9426 – on file 96 CEG/CEVSH	Concurrence regarding X-694 survey results and findings
Air Force to SHPO	01 September 05	Letter DHR 2005-9225 – on file 96 CEG/CEVSH	Survey of X-695
SHPO to Air Force	12 September 05	Letter DHR 2005-9225 – on file 96 CEG/CEVSH	Concurrence regarding X-695 survey results and findings
Air Force to SHPO	07 October 05	Letter DHR 2005-10451 – on file 96 CEG/CEVSH	Survey of X-696
SHPO to Air Force	20 October 05	Letter DHR 2005-10451 – on file 96 CEG/CEVSH	Concurrence regarding X-696 survey results and findings

Table 3-10. Consultation Timeline for SRI, Cont'd

Communication From/To	Date	Type/Reference#	Topic of Communication
Air Force to SHPO	29 November 05	Letter DHR 2005-12656– on file 96 CEG/CEVSH	Survey of X-765
SHPO to Air Force	30 December 05	Letter DHR 2005-12656– on file 96 CEG/CEVSH	Concurrence regarding X-765 survey results and findings
FDEP to SHPO	24 August 05	Letter on file 96 CEG/CEVSH	Letter requesting SHPO review of JCP application and consideration of effects to cultural resources potentially resulting from vibracore testing
SHPO to FDEP	21 September 07	Letter on file 96 CEG/CEVSH	Letter regarding SHPO review of JCP application and determination of no adverse effects to cultural resources from vibracore testing
Air Force to SHPO	12 October 07	Letter DHR 2005-9424– on file 96 CEG/CEVSH	For Survey Area 207 and 032; Updated site form for 8OK274
Air Force to SHPO	19 May 08	Letter DHR 2008-03084– on file 96 CEG/CEVSH	Survey of X-666
SHPO to Air Force	16 June 08	Letter DHR 2008-03084 – on file 96 CEG/CEVSH	Concurrence regarding X-666 survey results and findings
SHPO to Air Force	23 June 08	Letter on file 96 CEG/CEVSH	Concurrence regarding the Proposed Action
Air Force to SHPO	13 August 08	Letter on file 96 CEG/CEVSH	Letter requesting SHPO concurrence of Eglin AFB Final report on cultural resources at 64 shore sites
SHPO to Air Force cultural resource survey contractor	19 September 08	Letter on file 96 CEG/CEVSH	SHPO concurrence with survey findings of no adverse effect to submerged cultural resources
SHPO to Air Force	24 September 08	Letter on file 96 CEG/CEVSH	SHPO concurrence w Eglin AFB Final report on cultural resources in shore areas

Data and Letters on File CRIMS, 2010; SHPO = State Historic Preservation Officer; DHR = Division of Historical Resource

3.5.2 Existing Condition

Terrestrial Resources

One hundred and eighty-two identified cultural resources are located on SRI within Eglin AFB-controlled areas. Eglin AFB controls this entire area (8,905 acres), which has been formally surveyed for cultural resources. As a result, no additional archaeological surveys would be required prior to testing and training activities.

Of the 182 identified resources, 89 are archaeological sites and 93 are historic structures. The 89 archaeological sites include both historic and prehistoric components, isolated finds, and many 20th century military sites (see Table 3-11). Of these, 24 archaeological sites are considered eligible for listing on the NRHP and 55 are considered ineligible for the NRHP and require no additional work. In 2008, Eglin AFB completed a tropical storm damage assessment study that studied 44 archeological sites on SRI (Thomas, 2008).

Table 3-11. NRHP-Eligible Archaeological Sites Located on Santa Rosa Island

Site Number	Site Type	Site Condition*	NRHP Status
8OK00033	Unidentified Prehistoric (Hollow Hill site)	Threatened	Eligible
8OK00151	Multicomponent Prehistoric	Minor damage	Eligible
8OK00152	Prehistoric Component	Minor damage	Eligible
8OK00153	Multicomponent Prehistoric	Minor damage from previous erosion	Eligible
8OK00174	Prehistoric Component	None	Eligible
8OK00175	Prehistoric/20th Century Military Components	None	Eligible
8OK00176	Multicomponent Prehistoric	Minor damage	Eligible
8OK00182	Prehistoric Component	Minor damage	Eligible
8OK00193	Prehistoric Component	None	Eligible
8OK00221	Prehistoric Component	Minor damage	Eligible
8OK00241	Prehistoric Component	Minor damage	Eligible
8OK00245	Prehistoric Component	Major damage	Eligible
8OK00246	WWII JB2 Launch Facility	Major damage	Review- Data Recovery and MOA Planned
8OK00248	WWII JB2 Launch Facility	Minor damage	Review- Data Recovery and MOA Planned
8OK01909	Prehistoric Component	Minor damage	Eligible
8OK02118	Unidentified Prehistoric/20th Century Historic Components	None	Eligible
8OK02120	Unidentified Prehistoric	None	Eligible
8OK02239	Unidentified Prehistoric	Minor damage	Eligible
8OK02331	20th Century Military Component	Minor damage	Eligible
8OK02336	20th Century Military Component	Minor damage	Eligible
8OK02337	Prehistoric Component	Minor damage	Eligible
8OK02338	Prehistoric/20th Century Historic Components	Major damage	Eligible
8OK02340	Unidentified Shipwreck	Minor damage	Eligible
8OK02341	20th Century Military Component	Major damage	Eligible
8OK02342	Unidentified Prehistoric	Minor damage	Eligible

*Site-specific hurricane damage as assessed by Thomas, 2008.
Data from CRIMS, 2010

The 93 historic buildings and structures described in cultural resource data files consist almost entirely of Cold War period (1946–1989) construction. Many of these structures were constructed in support of the Boeing and the Michigan Aeronautical Research Center (BOMARC) missile program or the JB-2 development program (see Table 3-12). Thirty-four of these structures have been demolished and require no additional consideration. Of the remaining 59 buildings, 25 are considered eligible for the NRHP, 5 are currently under SHPO eligibility review, and 29 are considered ineligible for the NRHP.

Table 3-12. Historic Structures Recorded on Santa Rosa Island

Site Number	Site Name	Period	NRHP Status	Test Area	Year Built
8OK01921/#4985	Radar Maintenance Shop/ Paved Incline Facility	Cold War	Potential	A-4A	1955
8OK01431/#8317	Paint Storage/ Base Hazardous Storage	Cold War	Ineligible	A-3	1958
8OK01432/#8320	Drone Control Center/ Electronic Research Radar Facility	Cold War	Eligible	A-3	1957
8OK01433/#8351	Water Supply Building	Cold War	Ineligible	A-3	1957
8OK01434/#8352	Electric Power Plant	Cold War	Ineligible	A-3	1957
8OK01435/#8353	Microwave Station	Cold War	Ineligible	A-3	1956
8OK01496/#8354	Microwave Tower	Cold War	Ineligible	A-3	1970
8OK01436/#9200	Ferry Slip/ Cargo Pier	Cold War	Ineligible	A-10	1946
8OK01438/#9203	Water Supply Building/ WRM Medical Storage	Cold War	Ineligible	A-10	1947
8OK01439/#9207	Microwave Relay Facility/ Air Communication and Relay Center	Cold War	Ineligible	A-10	1957
8OK01440/#9208	Squadron Operations/ Research Equipment Storage	Cold War	Ineligible	A-10	1947
8OK01441/#9210	Airman's Dining Hall/ Research Equipment Storage Facility	Cold War	Ineligible	A-10	1947
8OK01442/#9211	Latrine/ Sanitary Latrine	Cold War	Ineligible	A-10	1947
8OK01443/#9212	Motor Repair Shop/ Base Engineering Maintenance Shop	Cold War	Ineligible	A-10	1947
8OK01444/#9221	Fuel Metering Test Building/ Base Hazardous Storage Facility	Cold War	Ineligible	A-10	1947
8OK01445/#9223	Missile Assembly Building/ Base Covered Storage Facility	Cold War	Ineligible	A-10	1947
8OK01446/#9225	Motor Assembly Building/ Base Storage Facility	Cold War	Ineligible	A-10	1947
Building # 9240	Armament Research Test Facility	Cold War	Review	A-10	1947
8OK01448/# 9260	Fuze Storage Facility	Cold War	Ineligible	A-11A	1946
8OK01449/# 9261	Segregated Storage Magazine/ Munitions Storage Igloo	Cold War	Ineligible	A-11A	1947
Building # 9268	Missile/Space Research Eng.	Cold War	Review	A-11	1957
Building # 9270	Missile/Space Research Eng.	Cold War	Review	A-11	1957
Building # 9296	Water Supply Building	Cold War	Review	A-13	1957
Building # 9297	Electronic Research Test Facility	Cold War	Review	A-13	1957
Building # 11097	Helicopter Pad	Cold War	Eligible	A-15	1958
Building # 12503	Potable Water Supply	Cold War	Eligible	A-15	1960
Building # 12508	Utility Vault/ Cable Junction House	Cold War	Eligible	A-15	1958
Building # 12510	Armament Research Test Facility/ CFD Building	Cold War	Eligible	A-15	1960
Building # 12511	Water Storage Tank	Cold War	Eligible	A-15	1958
Building # 12512	Armament Research Test Facility/ Masonry Building	Cold War	Ineligible	A-15	1989
Building # 12514	Missile Launch Control/ Interceptor Missile Squadron Operations	Cold War	Eligible	A-15	1959
Building # 12515	Fire Station	Cold War	Eligible	A-15	1958

Table 3-12. Historic Structures Recorded on Santa Rosa Island, Cont'd

Site Number	Site Name	Period	NRHP Status	Test Area	Year Built
Building # 12516	Water Supply Building/ Engineering Storage Facility	Cold War	Eligible	A-15	1958
Building # 12517	Armament Research Test Facility/ Masonry Building	Cold War	Ineligible	A-15	1989
Building # 12519	Missile and Space Research and Testing Facility/ Temporary Office and Storage	Cold War	Eligible	A-15	1960
Building # 12521	Missile and Space Research and Testing Facility/ Assembly and Maintenance Shop	Cold War	Eligible	A-15	1960
Building # 12522	Missile and Space Research and Testing Facility/ General Purpose Building	Cold War	Eligible	A-15	1960
Building # 12523	Electrical Transformer Substation 3A	Cold War	Ineligible	A-15	1958
Building # 12525	Liquid Fuel Unloading Pier	Cold War	Eligible	A-15	1958
Building # 12527	Underground Troop Shelter	Cold War	Ineligible	A-15	1960
Building # 12528	Missile Launch Control/ Operations Center	Cold War	Eligible	A-15	1958
Building # 12533	Troop Shelter	Cold War	Ineligible	A-15	1961
Building # 12534	Air Conditioning Plant Building/ Refrigeration Building	Cold War	Ineligible	A-15	1958
Building # 12535	Missile and Space Research and Testing Facility/ Protective Shelter	Cold War	Ineligible	A-15	1961
Building # 12548	Electrical Transformer Substation	Cold War	Eligible	A-15	1959
Building # 12549	Research Equipment Storage Facility/ Sandia Building	Cold War	Eligible	A-15	1959
Building # 12550	Missile and Space Research and Testing Facility/ Bunker #8	Cold War	Eligible	A-15	1959
Building # 12551	Launch Area Support Building	Cold War	Eligible	A-15	1959
Building # 12552	Missile and Space Research and Testing Facility/ Cable Shelter	Cold War	Eligible	A-15	1959
Building # 12555	Electronic Research and Engineering Facility	Cold War	Ineligible	A-15	1968
Building # 12556	Model V Shelter	Cold War	Eligible	A-15	1960
Building # 12558	Model V Shelter	Cold War	Eligible	A-15	1960
Building # 12561	Antenna Tower and Support Structure	Cold War	Ineligible	A-15	1968
Building # 12576	Industrial Waste Treatment and Disposal Facility/ Chemical Spill Station	Cold War	Eligible	A-15	1958
Building # 12588	Munitions Storage Igloo/ Warhead Storage	Cold War	Ineligible	A-15	1960
8OK02252	Bunker	Cold War	Potential	A-4A	1955

Historic Property Identification Efforts and Historic Properties Identified to Date

The entirety of SRI has been surveyed for cultural resources. NRHP-eligible archeological and historic sites located on the terrestrial portion of SRI are listed in Table 3-11 and Table 3-12. It should be noted, however, that the constantly shifting nature of the barrier island environment creates circumstances in which new, previously unknown cultural resources appear on a continual basis. At the same time, known resources are frequently downgraded to ineligible for the NRHP as a result of ongoing testing and mitigation efforts, or as a result of storm damage and exposure. Marine cultural resources are described in the following subsection.

Marine Cultural Resources

The protection of historic properties submerged in the Gulf falls within federal and state jurisdiction. Federal waters extend 12 nautical miles into the Gulf while state territorial waters extend 9 nautical miles into the Gulf. The shoreline and offshore area is under the jurisdiction of the U.S. Department of the Interior (DOI). The Eglin Environmental Management Cultural Resources Branch has coordinated the requirements of Section 106 of the NHPA with the Florida SHPO and Minerals Management Service (MMS) of the Outer Continental Shelf (OCS) Region of the DOI.

There are three main acts that address submerged cultural resources: the NHPA, the Abandoned Shipwreck Act, and the Florida Historical Resources Act. Section 106 of the NHPA, as amended, applies to submerged as well as terrestrial cultural resources. Section 106 requires all Federal agencies to identify any historic properties that any undertaking has the potential to affect, and seek ways to avoid or minimize any adverse effects on these historic properties. Furthermore, eligibility into the NRHP must be determined. The Exclusive Economic Zone (EEZ) extends 200 nautical miles from the shoreline and is under the jurisdiction of the DOI. The Abandoned Shipwreck Act of 1987 gives the title and jurisdiction over historic shipwrecks to the federal government extending to the EEZ. This applies even if the ship is within state waters. Before engaging in an activity that may negatively affect a shipwreck, this act requires consideration of the effect the activity may have, often mandating preservation. The Florida Historical Resources Act protects sites on state-owned land and submerged land within the Gulf. Any excavation or disturbance of a site requires a permit or contract from the state Division of Historical Resources, Bureau of Archaeological Research (U.S. Air Force, 2005).

The Historic Preservation Plan for Eglin AFB contains no guidance regarding management of resources of the over-water ranges; however, Eglin Cultural Resources is responsible for identifying resources and impacts within the 12-nautical mile offshore area. Consultation procedures cited in The Management Plan for Florida's Submerged Resources parallel NHPA Section 106 procedures with added emphasis on the protection of submerged resources through avoidance. For portions situated outside state waters, the MMS/OCS, DOI developed the Handbook for Archaeological Resource Protection, which contains prehistoric and historic high-probability zones and guidelines for the identification of submerged cultural resources.

An Air Force contractor conducted a cultural resources survey of proposed sand source areas in September 2007 to support a beach renourishment action on SRI. The survey included a review

of records on file with the state of Florida and NOAA to search for any previously identified underwater resources. Survey in the field utilized side-scan sonar, magnetometer, and detail phase sub-bottom seismic surveys, as well as vibracore samples (CRIMS, 2010).

Two known submerged shipwrecks are present in the SRI ROI (Figure 2-3). Details on the type and condition of these structures are currently unknown, and their eligibility for the NRHP is as yet undetermined.

3.6 AIR QUALITY

3.6.1 Definition

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 are generally expressed on a concentration basis in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards (Table 3-13). These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare. Further discussion of the NAAQS and state air quality standards are included in Appendix D. 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 based on available information for a particular pollutant are “unclassifiable” and are treated as attainment areas until proven otherwise.

3.6.2 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 are typically represented in tons per year. Inventory data establishes 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 fuel-handling operations. Mobile sources include motor vehicles, aerospace ground support equipment, and aircraft operations.

Table 3-13. National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon monoxide	9 ppm	8-hour ^a	None	
	10 mg/m ³			
	35 ppm	1-hour ^a		
	40 mg/m ³			
Lead	0.15 µg/m ³ ^b	Rolling 3-month average	Same as primary	
	1.5 µg/m ³	Quarterly average	Same as primary	
Nitrogen dioxide	53 ppb ^c	Annual (arithmetic average)	Same as primary	
	100 ppb	1-hour ^d	None	
Particulate matter (PM ₁₀)	150 µg/m ³	24-hour ^e	Same as primary	
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ^f (arithmetic average)	Same as primary	
	35 µg/m ³	24-hour ^g	Same as primary	
Ozone	0.075 ppm (2008 std)	8-hour ^h	Same as primary	
	0.08 ppm (1997 std)	8-hour ⁱ	Same as primary	
	0.12 ppm	1-hour ^j	Same as primary	
Sulfur dioxide	0.03 ppm	Annual (arithmetic average)	0.5 ppm	3-hour ^a
	0.14 ppm	24-hour ^a		
	75 ppb ^k	1-hour	None	

- a. Not to be exceeded more than once per year.
- b. Final rule signed 15 October 2008.
- c. The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
- d. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (Effective January 22, 2010).
- e. Not to be exceeded more than once per year on average over 3 years.
- f. 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 µg/m³.
- g. 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 µg/m³ (Effective 17 December 2006).
- h. 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 27 May 2008)
- i. (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 EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
 (c) EPA is in the process of reconsidering these standards (set in March 2008).
- j. (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
 (b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤1.
- k. Final rule signed 2 June 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

For comparison purposes, Table 3-14 presents the USEPA’s 2002 National Emissions Inventory (NEI) data for Okaloosa and Santa Rosa Counties (USEPA, 2002).

Table 3-14. Baseline Emissions Inventory for Okaloosa and Santa Rosa Counties

Source Type	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Okaloosa County					
Area Sources	1,867	281	8,397	462	4,527
Nonroad Mobile	16,150	1,099	162	109	1,897
On-Road Mobile	45,228	5,703	153	256	3,829
Point Sources	28	49	24	12	79
Total	63,273	7,132	8,736	839	10,332
Santa Rosa County					
Area Sources	2,142	233	13,265	323	3,291
Nonroad Mobile	9,806	950	120	89	1,524
On-Road Mobile	40,237	5,341	147	238	3,286
Point Sources	867	4,570	776	2,362	418
Total	53,052	11,094	14,308	3,012	8,519
Region of Influence					
Area Sources	4,009	514	21,662	785	7,818
Nonroad Mobile	25,956	2,049	282	198	3,421
On-Road Mobile	85,465	11,044	300	494	7,115
Point Sources	895	4,619	800	2,374	497
Total	116,325	18,226	23,044	3,851	18,851

Source: USEPA, 2002

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

The county data includes 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 nonroad. On-road mobile sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Nonroad sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2005).

In order to evaluate air emissions and their impact on the overall ROI, the emissions associated with the project activities are compared with the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 NEI data. Potential impacts to air quality are identified 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 is used in the USEPA's General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. According to USEPA's General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal action that has the potential to cause violations in a NAAQS nonattainment or maintenance area must undergo a conformity analysis. A conformity analysis is not required if the proposed action occurs within an attainment area. Emissions from activities on SRI would also be compared with the federal NAAQS.

3.7 NOISE

3.7.1 Definition of the Resource

Noise is defined as any unwanted sound. Defining characteristics of noise include sound level (amplitude), frequency (pitch), and duration. Each of these characteristics plays a role in determining the intrusiveness and level of impact of the noise on a noise receptor. The term noise receptor is used in this document to mean any person, animal, or object that hears or is affected by noise.

Sound levels are measured on a logarithmic decibel (dB) scale, reflecting the relative way in which differences in sound energy levels are perceived. A sound level that is 10 dB higher than another would normally be perceived as twice as loud, while a sound level that is 20 dB higher than another would be perceived as four times as loud. Under laboratory conditions, a person with normal hearing can detect a change in sound level as small as 1 dB. Under most nonlaboratory conditions, people notice changes in sound level of approximately 3 dB.

Sound measurement may be further refined through the use of frequency “weighting.” A typical healthy human can detect sounds that range in frequency from about 20 hertz (Hz) to 20,000 Hz (Federal Interagency Committee on Noise [FICON], 1992). However, all sounds throughout this range are not heard equally well. In “A-weighted” measurements, the frequencies in the 1,000 to 4,000 Hz range are emphasized, because these are the frequencies to which human hearing is most sensitive. Sound level measurements weighted in this way are termed *A-weighted decibels* (dBA). In the case of sonic booms, blast noise, and other impulsive “booming” noises, sound is felt as well as heard. With these types of noise, overpressure may be considered more annoying than the sound itself. For this reason, impulsive sounds are measured using “C-weighting,” which does not attenuate the lower frequencies to the extent that A-weighting does. Sound level measurements weighted in this way are termed *C-weighted decibels* (dBC). Unless otherwise noted, all sound levels referenced in this REA can be assumed to be A-weighted.

Typically, the sound level at any given location changes constantly. For example, the sound level changes continuously when an aircraft flies by, starting at the ambient (background) level, increasing to a maximum when the aircraft passes closest to the receptor, and then decreasing to ambient levels when the aircraft flies into the distance. The term maximum sound level, or “L_{max},” represents the sound level at its greatest level during an aircraft overflight when sound is at its maximum.

Because munitions noise levels are so strongly influenced by meteorological conditions (e.g., winds), the peak noise level reaching a particular location after a particular noise event may vary significantly. The metric “peak noise exceeded by 15 percent of firing events,” or “PK₁₅(met),” accounts for weather-influenced statistical variation in received single-event peak noise levels. PK₁₅(met) is the peak noise level, without frequency weighting, expected to be exceeded by 15 percent of all firing events. Because this value is based on probability and actual noise levels would vary higher and lower, it cannot be directly measured in the field. If multiple weapon types are fired from one location, or from multiple firing locations, the reported PK₁₅(met) level would be based on the loudest weapon type at the closest location. The U.S. Army Center for

Health Promotion and Preventive Medicine (USACHPPM) recommends this metric as a supplement to time-averaged noise levels when discussing impulsive noise (USACHPPM, 2005).

Because both the duration and frequency of noise events also play a role in determining overall noise impact, several metrics are used that account for these factors. Each metric discussed below is used in the assessment of noise impacts in this REA.

Sound exposure level (SEL) accounts for both the maximum sound level and the length of time a sound lasts. SEL does not directly represent the sound level heard at any given time. Rather, it provides a measure of the total sound exposure for an entire event compressed into 1 second. This metric is useful for comparing fast-moving and slow-moving aircraft and is a good predictor of several noise impacts, including sleep disturbance and speech interference.

Day-night average sound level (DNL) represents aircraft noise level averaged over a 24-hour period, with a 10 dB penalty to flights occurring between 10:00 PM and 7:00 AM to account for the added intrusiveness of noise during these hours. It is important to recognize that the DNL metric does not represent the noise heard at any single point in time, but rather a weighted average level of noise events that occur over the course of a day. The DNL metric has been endorsed by several federal agencies as being the best descriptor of general noise conditions in the vicinity of airfields (USEPA, 1974; Federal Interagency Committee on Urban Noise [FICUN], 1980).

C-weighted day-night sound level (CDNL) is the 24-hour day-night averaged C-weighted sound level computed for areas subjected to sonic booms and blasts from high explosives. Use of the C-weighted scale accounts for the dominance of low-frequency components of these types of sounds.

Onset-rate adjusted monthly day-night average sound level (DNL_{mr}) is the measure used for subsonic aircraft noise in military airspace (ranges, military training routes (MTRs), military operating areas (MOAs), or warning areas). This metric accounts for the fact that when military aircraft fly low and fast, the sound can rise from the ambient level to its maximum very quickly. Known as an onset rate, this effect can make noise seem louder due to added “startle” effects. Penalties of up to 11 dB are added to account for the onset rate.

Effects of Noise

Annoyance, speech interference, sleep interference, human health impacts, structural damage, and wildlife impacts have all been associated with noise. In this document, the “Noise” sections of each chapter addresses general noise impacts on humans and structures, while subsequent sections discuss the impacts of noise on land use, environmental justice, biological resources, and cultural resources.

Annoyance is the most common effect of aircraft noise on humans. Aircraft noise often interferes with activities such as conversation, watching television, using a telephone, listening to the radio, and sleeping. This interference often contributes to individuals becoming annoyed. Whether or not an individual becomes annoyed by a particular noise is highly dependent on emotional and situational variables of the listener as well as the physical properties of the noise (Federal Aviation Administration [FAA], 1985). However, when assessed over long periods of

time and with large groups of people, a strong correlation exists between the percentage of people highly annoyed by noise and the time-averaged noise exposure level in an area (Schultz, 1978; Fine gold et al., 1994). This finding is based on surveys of groups of people exposed to various intensities of transportation noise. A generalized categorization of noise-induced annoyance can be found in Table 3-15. As discussed earlier in this section, DNL (A-weighted) is used to assess noise for which audible sound is the major concern (e.g., subsonic aircraft noise, small arms fire). CDNL (C-weighted) is used to assess noise in which vibration and low-frequency components are a major concern (e.g., sonic booms, high-explosive munitions noise).

Table 3-15. Relationship Between Noise Level and Percent of Population Highly Annoyed

Criteria	Noise Level		
A-weighted average noise levels (continuous noise)	< 65 dB	65–75 dB	> 75 dB
C-weighted average noise levels (impulsive noise)	< 62 dBC	62–70 dBC	> 70 dBC
Unweighted peak noise levels (small arms noise)	< 87 dBP	87–104 dBP	> 104 dBP
	Percent of Population Highly Annoyed		
	< 15%	15%–39%	>39%

Source: USACHPPM, 2005; U.S. Army, 1997

< = less than; > = greater than; dB = decibels; dBC = C-weighted decibels; dBP = P-weighted decibels

Note: The primary noise metric used by the U.S. Army to describe small arms noise is PK₁₅(met)

USEPA recommends that noise level in sleeping areas be less than 45 dB DNL (USEPA, 1974). As modern homes typically provide an exterior-interior noise level reduction of greater than 20 dB (U.S. Navy, 2005), residential areas in areas where noise is higher than 65 dB DNL are assumed to not meet the USEPA recommendation. Studies indicate a tendency for humans to habituate to regularly occurring nighttime noise over time, eventually reducing susceptibility to noise-induced sleep disturbance (Fidell et al., 1995; Pearsons et al., 1995; Kryter, 1984).

In addition, USEPA recommends that, to protect public health with an adequate margin of safety, exterior noise levels should not exceed 55 dB DNL and interior noise levels should not exceed 45 dB DNL in noise-sensitive locations (USEPA, 1974). FICUN took these recommendations into consideration when developing its recommendations on compatibility of land uses with noise (FICUN, 1980). These recommendations have been adopted, with minor modifications, by the DoD (DoD Instruction 4165.57).

Noise is generally viewed as being one of a number of general biological stressors. Some studies have indicated that excessive exposure to intense noise might contribute to the development and aggravation of stress-related conditions such as high blood pressure, coronary disease, ulcers, colitis, and migraine headaches. Other studies have found no correlation between noise and various health conditions. Nonauditory health effects of noise are not well established at this time, but they are likely only experienced at extremely high noise levels (USEPA, 1981).

A considerable amount of data on noise-related hearing loss has been collected and analyzed. For example, it has been established that 8 hours of continuous exposure to 85 dB increases the risk for potential permanent hearing loss over a 40-year period (USEPA, 1974). The National Academy of Sciences Committee on Hearing, Bioacoustics, and Biomechanics (CHABA) identified 75 dB DNL as the minimum level at which hearing loss may occur (CHABA, 1977). However, it is important to note that CHABA assumed long-term exposure (40 years) before hearing loss would occur. The U.S. Army has established a peak noise level of 140 dB as the

threshold above which a temporary threshold shift (measured as increase in lowest level at which a sound is audible) may occur (USACHPPM, 2005).

3.7.2 Existing Conditions

Santa Rosa Island

Wind and surf are the major natural sound sources on SRI. Anthropogenic noise sources include vehicles and aircraft supporting the various military missions on SRI.

Gulf of Mexico

Ambient (natural) noise in the ocean may arise from natural sources, such as wind action on the sea surface, rain or hail striking the sea surface, and various types of marine life. Ambient noise sources may be continuous and persistent, or transient and intermittent. In open oceans, the primary persistent natural noise source tends to be wind action on the sea surface.

Anthropogenic (man-made) sound within the project area consists of commercial and recreational vessel traffic, military operations onshore, and dredging. In open oceans, the primary persistent anthropogenic noise source tends to be commercial shipping. Surface ships generate noise via a number of mechanisms, especially propeller blade cavitation.

Ambient and anthropogenic noise levels in the northern Gulf of Mexico range from approximately 40 dB to 110 dB.

3.8 SAFETY AND RESTRICTED ACCESS

3.8.1 Definition of the Resource

The existing safety environment encompasses risk to public health and, with respect to training activities, risk to the health of military personnel, and those 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 unexploded ordnance from historical missions.

This section presents information concerning the existing range safety conditions at Eglin AFB. It discusses the safety regulations and process, safety organizations and responsibilities, and other safety procedures.

Regulatory and Management Overview

This section discusses the regulations, policies, and management protocols in place at Eglin AFB for range safety that impact SRI use. 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 (AAC/SE) 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 (AFPAM) 90-902, *ORM Guidelines and Tools*. The steps in the ORM process, as they relate to the Test Safety Review Process are (U.S. Air Force, 2000):

1. *Identify the hazards.* Personnel involved with the test or activity act as a team to identify all potential hazards.
2. *Assess the potential risk.* Assess the probability and severity of loss from exposure to the identified hazard.
3. *Analyze risk control measures.* Investigate specific strategies and tools that reduce, mitigate, or eliminate the risk.
4. *Make control decisions.* Approve the best risk control or combination of controls based on the analysis of overall costs and benefits.
5. *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.
6. *Supervise and review.* Continue the ORM process throughout the accomplishment of every test program.

This instruction affects all test operations conducted under a 46 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 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.

A number of standard safety procedures exist to ensure limited public access to affected training areas during test implementation. These procedures require every practical effort to keep the designated training areas clear of all nonparticipating persons and vehicles.

Large portions of Eglin AFB are closed to public use, which facilitates range clearance operations. Depending on the type of training being conducted, contingency personnel may stand by in case of emergencies (U.S. Air Force, 2003a).

3.8.2 Existing Conditions

Specific Safety Risk Issues

Two issues of particular concern with respect to safety are discussed in this section – unexploded ordnance and laser use.

Unexploded Ordnance

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. Eglin AFB has been testing munitions for over 60 years. 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 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 Directorate of 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, 1998b). SRI is known to have been used for munitions testing and therefore is considered likely to be contaminated with UXO. Therefore, SRI is permanently closed to public access.

Laser Use

Lasers emit beams of optical radiation in the ultraviolet, visible, and infrared spectrum. Optical radiation is classified as non-ionizing radiation that is different from that of ionizing radiation, such as X-rays and gamma rays, which are known to cause different biological effects. The hazards most commonly associated with the operation of a powerful laser and direct contact with the beam is the potential for damage to the eye, burns to the skin, explosion from the presence of volatile chemicals, and fire from contact with flammable materials.

Laser Hazards

Eye hazards can be either corneal or retinal burns (or both), depending upon laser wavelength. Corneal or lenticular opacities (cataracts) or retinal injury may be possible from lengthy exposure to excessive levels of short-wavelength light and ultraviolet radiations due to photochemical effect. Ocular hazards represent a potential for injury to several different structures of the eye. Ocular injury from heating is generally dependent on which structure absorbs the most radiant energy per volume of tissue. Photochemical injury also depends upon the energy per photon of the energy absorbed (i.e., shorter wavelength radiant energy has more energetic photons). Retinal effects are possible when the laser emission wavelength occurs in the visible and near-infrared spectral regions, that is, 400 to 1,400 nanometers (nm). The light

directly from the laser or from a specular (mirror-like) reflection entering the eye at these wavelengths can be focused to an extremely small image on the retina. The incidental corneal irradiance (or radiant exposure) will be increased approximately 100,000 times at the retina due to the focusing effects of the cornea and lens. Laser emissions in the ultraviolet and far-infrared spectral regions (outside 400 to 1400 nm) produce ocular effects primarily at the cornea. However, laser radiation at certain wavelengths may reach the lens and cause damage to that structure

Radiation at visible wavelengths, 400 to 700 nm, and near infrared wavelengths, 700 to 1,400 nm, is transmitted through the ocular media with little loss of intensity and is focused to a spot on the retina 10 to 20 micrometers in diameter. Such focusing can cause intensities high enough to damage the retina. For this reason, laser radiation in the 400 to 1,400 nm range is termed the retinal hazard region. Wavelengths between 400 and 550 nm are particularly hazardous for long-term retinal exposures, that is, exposures lasting for minutes or even hours. This photochemical effect is sometimes referred to as the blue light hazard.

Skin hazards are the potential to burn the skin from acute exposure to high levels of optical radiation. At some specific ultraviolet wavelengths, skin carcinogenesis may occur. Photosensitive reactions are possible in the 400- to 600-nm (visible) wavelength region.

Laser Classification

The basic approach of virtually all laser safety standards has been to classify lasers by their hazard potential, which is based upon their optical emission. The next step is to specify control measures commensurate with the relative hazard classification. Therefore, a laser is classified based upon the hazard it presents, and for each classification, a standard set of control measures applies. This philosophy has given rise to a number of specific classification schemes such as the one employed in the ANSI Z136.1-2000 American National Standard for Safe Use of Lasers. The ANSI scheme has four hazard classifications that apply to the laser alone or to the laser system. The classification is based upon the beam output power or energy per pulse for pulsed lasers. The classification scheme is used to describe the capability of the laser or laser system to produce injury to personnel. The classifications for lasers are as follows: 1, 2, 3a, 3b and 4, where higher class numbers indicate a greater potential hazard.

Laser Safety

Several missions conducted on SRI involve laser use. Safety requirements specifically for lasers include the following:

- All personnel would wear laser goggles as needed for unsafe radiation levels.
- Lasers would only actively radiate directly over designated targets.
- A buffer area around the laser target would be designated for each mission.
- Ground and surface personnel would clear the test area before granting permission to actively fire a laser.

Restricted Access

Restricted access pertains to the closure of areas on SRI because of mission activities. The purpose of restricting access to the public is to ensure public 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 1-3. Some military missions may require certain areas to be closed to the public for various periods of time. Recreational access information is available on a daily basis by calling the Base Information Line, (850) 882-1110 (U.S. Air Force, 2003a).

3.9 LAND USE AND RECREATION

3.9.1 Definition of the Resource

Land use generally refers to human management and use of land. Nearby land use also includes recreational and natural resources management, which is discussed in detail in the Integrated Natural Resources Management Plan (U.S. Air Force, 2007). Recreation resources consider outdoor recreational activities that take place away from the residences of participants. This includes natural resource areas and man-made facilities (such as county parks and facilities) that are designated or available for public recreational use.

3.9.2 Existing Conditions

Eglin AFB controls 4,760 acres of SRI that includes a 4-mile strip of limited-access beach eastward of Fort Walton Beach, a restricted access 13-mile section extending to the west to Navarre Beach, and a small 0.25-mile section in between the two parcels at Test Area A-5. There are 2.5 miles of Okaloosa County controlled property between the two parcels of Eglin property. There are a total of 3,701 acres (approximately 77 percent) of restricted access and 630 acres (approximately 13 percent) of public beach access along SRI. The public can access the Gulf-side and sound-side beaches at multiple locations along the limited-access portion of SRI. Authorized public recreation on the limited-access portion of SRI consists of fishing, swimming, sun bathing, and beach walking. The public is instructed to stay below the primary dune line. The area comprising the 4-mile strip east of Fort Walton Beach is open to public access through identified access points (see Figure 3-5).

The portion of SRI that is controlled by Okaloosa County is composed of four classified areas or zones and includes: private residential areas; apartment, hotel court and hotel areas; light commercial and concession areas; and parks, beaches and freeway areas (Okaloosa County, 2010). Marinas, hotels, condominiums, houses, parks, restaurants, bars/clubs, and shops are found throughout the county portion of SRI (see Figure 3-5). The public uses these areas for recreational activities, and near-shore areas of the Gulf are used for boating, fishing, and other water related activities. The beaches and available recreational opportunities at SRI and in the general area are an important economic driver for the surrounding counties and in particular Okaloosa County. Additional details regarding recreational activities are discussed in Section 3.10.

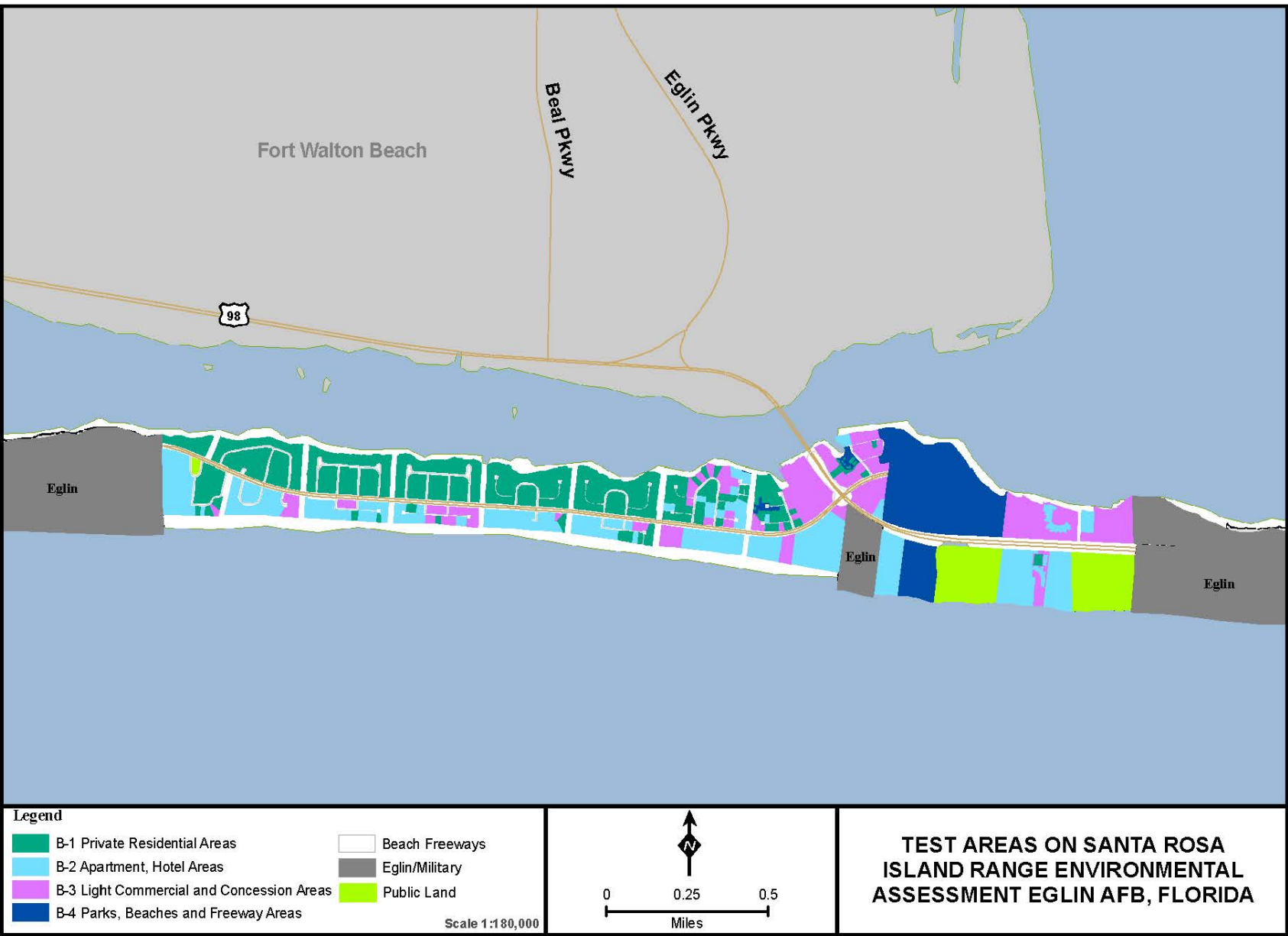


Figure 3-5. Land Use and Recreation Along Santa Rosa Island, Okaloosa County

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3.10 SOCIOECONOMIC RESOURCES

3.10.1 Definition of Socioeconomic Resources

Socioeconomic resources are defined as the basic attributes associated with human activities. The following resources are addressed under socioeconomics as the indicators that could be potentially impacted by activities associated with military activities on SRI including: economic activity (e.g., tourism, fishing), population, and environmental justice and special risks to children.

3.10.2 Existing Conditions for Socioeconomic Resources

The SRI ROI directly influences the economy of Santa Rosa County and Okaloosa County. Population is the central element of the socioeconomic analysis of the region. The population of the two primary counties has grown by more than 14 percent between 2000 and 2008 (see Table 3-16).

Table 3-16. Populations of Santa Rosa and Okaloosa Counties Within the ROI

County	2000 Population	2008 Population	Avg. Annual Percent Change
Okaloosa County	170,498	179,693	0.66%
Santa Rosa County	117,743	150,053	3.08%
Total	288,241	329,746	1.70%

Source: USCB, 2008a; 2008b

Currently, Okaloosa County is the 26th most populous county in the state of Florida (USCB, 2008a). In Okaloosa County, the communities with the largest population are Fort Walton Beach, Crestview, and Niceville. Between 1990 and 2000, the majority of the increase in population in Okaloosa County occurred in the unincorporated areas. However, between 2000 and 2008 the majority of the increase in population has been in the incorporated areas of Crestview and Destin. Crestview has experienced the greatest amount of population growth between 2000 and 2008 and is the largest incorporated area in terms of population according to 2008 estimates.

Over the period of 2000 to 2008, the population of Santa Rosa County increased by over 32,000 persons or just over 27 percent (at an average annual rate of 3.08 percent) to reach approximately 150,053 persons (USCB, 2008b). There are three incorporated areas in Santa Rosa County including Jay, Gulf Breeze, and Milton. Milton is the largest incorporated area in terms of population during 2008. Gulf Breeze Proper has limited land and is approaching build-out. The majority of recent population growth in the county has been occurring in the unincorporated areas of Navarre and Pace (Ogletree, 2009).

SRI ROI Industries

The military and the local economy rely heavily on the unique resources of the island. On SRI, the military can conduct training and testing over and in the sea, on land, and in the transitional surf zone. This type of landform is important to certain air, land, and sea operations, training, and testing, but is not readily available elsewhere. Additionally, the warm weather, reasonable cost of living, and proximity of Eglin facilities and services have made the area a preferred destination for many military retirees. Tourists also are attracted to the pristine beaches. The commercial development of Destin has made the area a destination for an increasing number of vacationers. A great deal of the coastline of the surrounding counties has been significantly developed to support the tourism industry.

Military

Eglin AFB spans over each county in the region and includes two other installations, Hurlburt Field and Duke Field, to form the Eglin Complex. The Eglin Complex has an overall economic impact of over \$6 billion annually (EDC Okaloosa County, 2009). The military and other defense-related industries are the largest contributors to Okaloosa County's economy and account for 73 percent of economic activity in Okaloosa County. In FY2005, defense contracts resulted in over \$475 million generated annually; 350 local businesses were awarded contracts; and an estimated 21,000 local jobs had been created in industries related to military spending in Okaloosa County (EDC Okaloosa County, 2009).

Tourism

Tourism is the second largest contributor to Okaloosa County's economy. The primary attractions are the beaches and sport fishing. An estimated 4.5 million tourists visit the Okaloosa County area annually and generate an estimated \$1 billion in economic activity to the area or approximately \$2.8 million per day. In addition, tourism supports an estimated 35,000 local employment opportunities (EDC of Okaloosa County, 2009). The highest levels of employment for the leisure and hospitality industries, which are related measures of tourism, occur between April and September and typically peak around June and July (EDC Okaloosa County, 2009).

Fishing

Florida is consistently ranked as one of the most popular states for fishing. Okaloosa and Santa Rosa County are no exception and boast a number of popular fishing areas and fishing tournaments. The city of Destin, in Okaloosa County, is not only a popular tourist area for the pristine beaches but also is home to one of Florida's largest charter boat fleets. Deep sea bottom fishing, offshore trolling, pier beach and jetty fishing, and inshore trolling are some of the most common fishing activities. There are many fishing spots along Highway 98 including the Jetties at Destin Pass, Okaloosa Pier, and the Navarre Beach Fishing Pier. Beach pier and jetty fishing in the Gulf are best between April and October and produce catch such as pompano, whiting, channel bass, sheepshead, cobia, spanish mackerel, king mackerel, and jack crevalle (DestinFl.com, 2009).

The majority of Destin’s fishing fleet specializes in Deep Sea Fishing and is offered year-round. The best time to go deep sea fishing is between the months of April and October. Most common species caught during this time include grouper, amber jack, king mackerel, marlin, sailfish, mahi mahi, wahoo, tuna, and shark. Snapper, trigger, and red fish are common year-round (FishDestin.com, 2009). Offshore trolling is also offered and typically takes place 300 feet or about 27 miles southwest of Destin.

The number of registered vessels in Okaloosa County and Santa Rosa County has decreased by approximately 22.5 percent between 2001 and 2007 as shown in Table 3-17 and Table 3-18.

Table 3-17. Okaloosa County Base Tax by Vehicle Type, FY2000–FY2007

Type of Vessel	FY (July-June)							
	2000	2001	2002	2003	2004	2005	2006	2007
Recreation								
Transactions	25,020	15,587	16,889	17,216	18,096	18,210	18,272	18,101
Revenue (\$)	-	-	95,455	104,909	111,178	111,260	113,264	113,796
Commercial								
Transactions	1,401	424	436	425	418	399	383	352
Revenue(\$)	-	-	12,045	18,512	18,272	17,347	16,520	14,681
Total								
Transactions	26,421	16,011	17,325	17,641	18,514	18,609	18,655	18,453
Revenue (\$)	492,973	257,874	107,501	123,421	129,450	128,607	129,784	128,476

Source: Florida Department of Highway Safety and Motor Vehicle (FDHSMV), 2008

Table 3-18. Santa Rosa County Base Tax by Vehicle Type, FY2000–FY2007

Type of Vessel	FY (July-June)							
	2000	2001	2002	2003	2004	2005	2006	2007
Recreation								
Transactions	16,191	11,406	12,263	12,617	13,300	12,859	13,295	13,846
Revenue (\$)	-	-	64,150	73,059	77,330	74,984	77,567	81,250
Commercial								
Transactions	553	224	218	207	204	187	155	160
Revenue(\$)	-	-	2,930	4,644	4,461	4,082	3,124	3,545
Total								
Transactions	16,744	11,630	12,481	12,824	13,504	13,046	13,450	14,006
Revenue (\$)	266,159	163,287	67,079	77,703	81,791	79,065	80,691	84,795

Source: Florida Department of Highway Safety and Motor Vehicle (FDHSMV), 2008

3.10.3 Definition of Environmental Justice and Special Risks to Children

Concern that certain disadvantaged communities may bear a disproportionate share of adverse health and environmental effects compared with the general population led to the EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO directs federal agencies to identify and address, as appropriate, disproportionately high and adverse environmental and human health effects in minority and low-income communities, and 32 Code of Federal Regulations (CFR) 989, EIAP, addresses the need for consideration of environmental justice issues in compliance with the National

Environmental Protection Act (NEPA). EO 12898 applies to federal agencies that conduct activities that could substantially affect human health or the environment.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to identify and assess environmental health and safety risks to children, coordinating research priorities on children's health, and ensuring that their standards take into account special risks to children. Children are more sensitive than the adult population to certain environmental effects, such as airborne asbestos and lead paint exposures from demolition, safety with regard to equipment, accidents within structures under demolition, and noise. Activities occurring near areas that tend to have a higher concentration of children than the typical residential area during any given time, such as schools, churches, and community childcare facilities, may further intensify potential impacts to children.

The analytical methods applied in this section are in accordance with the *Interim Guide for Environmental Justice with the Environmental Impact Analysis Process* (U.S. Air Force, 1997b). Minority, low-income, and youth populations are defined in the guidance as follows.

- *Minority Population:* Blacks, American Indians, Eskimos, Aleuts, Asians, Pacific Islanders, and persons of Hispanic or Latino origin of any race.
- *Low-Income Population:* Persons living below the poverty level, based on a 2000 equivalent annual income of \$17,603 for a family of four persons.
- *Youth Population:* Children under the age of 18 years.

The context is necessary to understand if environmental impacts would disproportionately affect minority, low-income, or youth populations. An appropriate basis for comparison is the community of comparison (COC), where COC is defined as the smallest governmental or geopolitical unit(s) that encompasses the impact footprint for each resource, which in this case is a county. Data from the 2000 Census on race, ethnicity, poverty status, and age were collected at the block level (the smallest geographical unit for which this census data is available) for Okaloosa County and Santa Rosa County. In addition, general demographic profiles for the county, the state of Florida, and the United States were compiled to provide analytical context.

The percent minority and low-income populations in the affected census tracts are compared with the percent minority and low-income populations in the overall COC. Census blocks with a higher percentage of minority or low-income population than for the county as a whole are identified as communities of concern. An affected census tract that has a minority or low-income percentage greater than the state average is presumed to be high even if the encompassing COC exhibits a higher minority or low income percentage than the affected tract. If the percent minority and low-income populations in an affected census tract are less than the corresponding percentages in the COC overall, then no disproportionate impacts are presumed to occur on minority or low-income populations. With regard to special risks to children, census blocks exhibiting higher than average youth populations were identified, as well as the location of area schools and childcare centers.

3.10.4 Existing Conditions for Environmental Justice and Special Risks to Children

Table 3-19 identifies total population and percentage populations of concern in Okaloosa County and Santa Rosa County, the state of Florida and the United States. Population density in the counties (Figure 3-6) was larger in Okaloosa County than in Santa Rosa and totaled 182.2 persons per square mile. By comparison, the state of Florida has an overall population density of 296.4 persons per square mile, reflecting the relatively sparse population in the region surrounding Eglin AFB.

Table 3-19. Total Population and Populations of Concern by County, 2000

Location	County Population	Percent Minority	Percent Low-Income	Percent Youth	Population Density*
Okaloosa County	170,498	19.0	8.8	24.7	182.2
Santa Rosa County	117,743	10.9	9.8	26.6	115.8
Florida	15,982,378	34.6	12.5	22.8	296.4
United States	281,421,906	30.9	12.4	25.7	79.6

Source: USCB, 2000a; 2000b; 2000c; and 2000d

*Population density is calculated as average persons per square mile.

Minority persons represent 19 percent in Okaloosa County, 10.9 percent in Santa Rosa County, and 34.6 percent of the state population. African Americans are the predominant minority group in each county, while at the state level, Hispanic or Latino persons are the largest minority group.

The percentage of persons and families in the two county ROI with incomes below the poverty level was somewhat lower than state levels. Okaloosa County and Santa Rosa County exhibited relatively low poverty rates of 8.8 and 9.8 percent, respectively, compared with the state level of 12.5 percent. The map presented in Figure 3-7 displays the minority and low-income communities of concern in the Eglin AFB region.

The youth population, comprising children under the age of 18 years, totaled 24.7 percent in Okaloosa County and 26.6 percent in Santa Rosa County, compared with 22.8 percent for Florida overall. Schools and childcare centers, in addition to certain other public service establishments are displayed on the map presented in Figure 3-8.

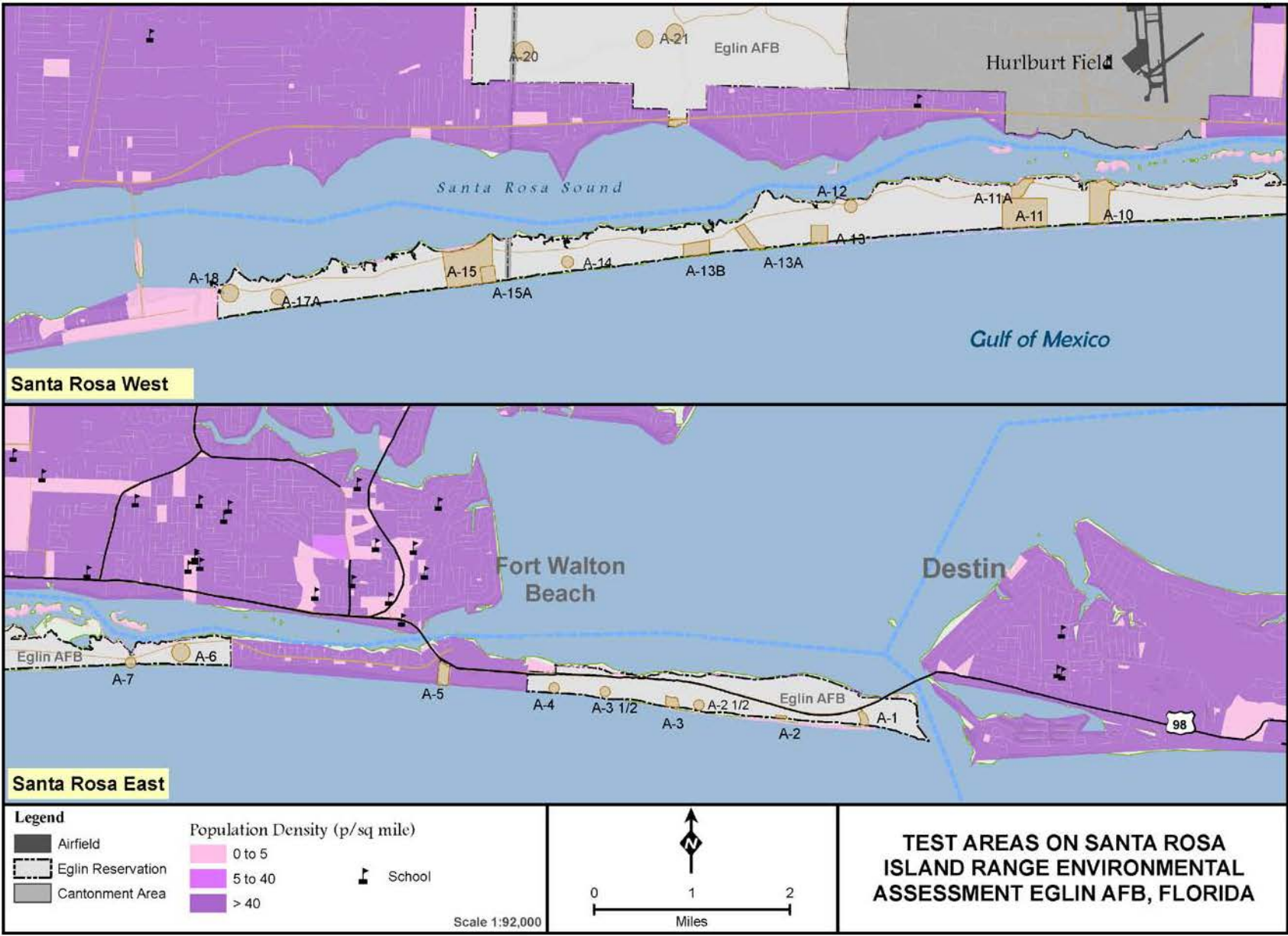


Figure 3-6. Distribution of Population Density on Santa Rosa Island

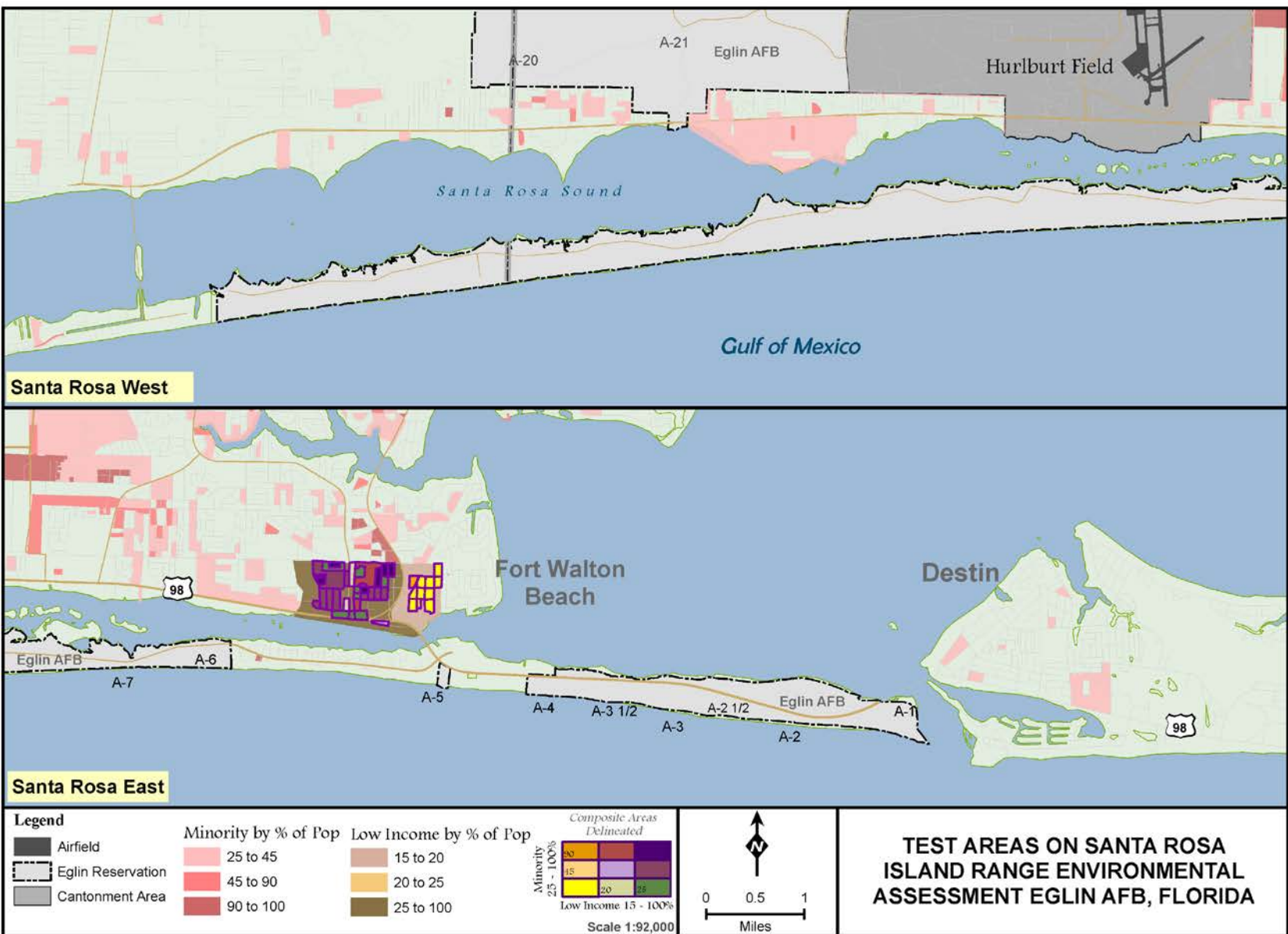


Figure 3-7. Areas of Concern with High Minority/Low-Income Populations as Compared to Each County's Average

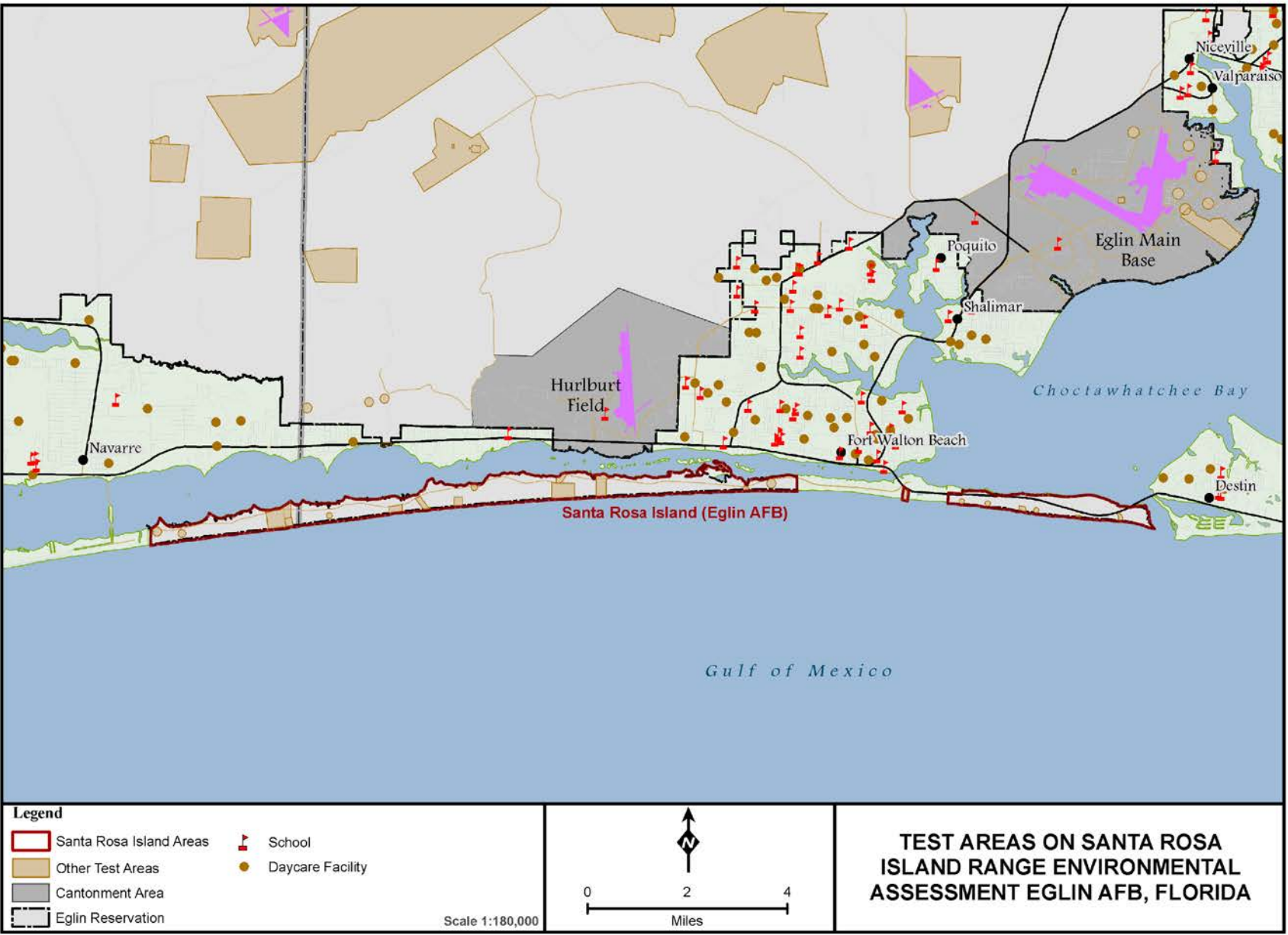


Figure 3-8. Areas with High Youth Population as Compared to Each County's Average

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4. ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential impacts associated with SRI test and training activities (described in Chapter 2) on the affected environment (described in Chapter 3). The analysis examines the potential impacts of each of the proposed alternatives on the following resource areas:

- Chemical materials/debris
- Soils
- Water resources
- Biological resources
- Cultural resources
- Air quality
- Noise
- Safety and restricted access
- Land use and recreation
- Socioeconomic resources

4.1 CHEMICAL MATERIALS/DEBRIS

This section discusses the potential impacts to SRI resources due to chemical materials and debris. Chemical materials include liquid, solid, or gaseous substances that may be released to the environment as a result of mission activities. Debris includes physical materials deposited on the surface of terrestrial or aquatic environments during mission activities.

4.1.1 No Action Alternative

Chemical Materials

The transport, storage, use, and disposal of hazardous materials and waste associated with activities within the SRI ROI should be coordinated with Eglin's Environmental Compliance Branch, Pollution Prevention Section (96 CEG/CEVCP) and disposed of appropriately according to regulations and AACI 32-7003, *Hazardous Waste Management Plan*. AFI 32-7086 Supplement I, *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, hazardous materials, or hazardous waste would be reported.

Eglin AFB has developed emergency response procedures and site-specific contingency plans for all hazardous materials locations. Procedures and responsibilities for responding to a

hazardous material spill or other incidents are described in the Hazardous Waste Management Plan and the Eglin AFB Spill Prevention, Control, and Countermeasures Plan.

The potential effects of the release of chemical materials associated with munitions use, missile launches, ground maneuvers, air operations, surf zone testing, small boat obscurant testing, and pyrotechnics were analyzed in the 2006 EBD (U.S. Air Force, 2006), 2005 PEA (U.S. Air Force, 2005), and other documents. The analyses were based on the suite of activities evaluated as the Preferred Alternative of the 2005 PEA, which represents the baseline activity in this REA.

Munitions Use

Munitions use includes inert (blank) small arms fire and 30-mm rounds fired from LCACs. Eglin AFB requires that casings from small arms blank munitions be picked up after missions. Although lack of enforcement results in some residual debris, most occurs within buildings used as training objectives by SOF. In addition, corrosion time of the expended casings is very long.

The initial 1997 EBD (U.S. Air Force, 1997) estimated 20 annual LCAC missions firing approximately 8,000 pounds of inert rounds into the nearshore Gulf of Mexico, a level of activity that was never achieved. This type of action has occurred only once within the last 14 years. Analysis of live 30-mm fire concluded no significant debris effects and offered a comparison between SRI-generated debris and other forms, such as artificial reef materials. Other debris sources far outweighed projected SRI generated debris. In addition, the 30-mm cartridges stay on the LCAC. Live rounds are currently not used on SRI; the use of live 30-mm rounds would only occur on an intermittent, mission-specific basis approved through the AFF 813 process.

In conclusion, there would be no significant adverse effects within the SRI ROI due to chemical contamination of soil, water, or biota.

Missile Launches

Analysis of combustive pollutant emissions presented in the *Environmental Assessment for Projected Patriot Testing (Five-Year Plan)* (U.S. Air Force, 2002a) concluded no significant impacts to the human environment for up to 20 PATRIOT missile launches per year. Missile debris is evaluated below under "Debris."

Ground Testing and Training

Components of flare combustion residue are the primary chemical materials produced by ground movement operations. Prior analysis in the 1997 SRI EBD determined that up to 67,000 flares could be released in a peak hour without adverse health effects to people or wildlife. For a typical target area of 10,000 acres, 220,000 flares could be released annually without significantly increasing short- or long-term health risks from hexavalent chromium or lead, the primary constituents of concern in flare residue. There are no indications that flare use has exceeded this level. Flare use is not considered to pose significant adverse effects to the environment.

Air Operations

Air operations pertinent to this analysis consist of aircraft supporting OA-HITL testing, helicopter flights, and landings and paratroop drops. Other types of aircraft sorties were not analyzed in the 2005 SRI PEA. The low numbers of aircraft used in missions over the SRI ROI are considered to produce a minimal amount of combustive emissions, with only local and temporary effects on air quality.

Surf Zone Testing

Surf zone tests were analyzed in the 2005 PEA. The last live detonation surf zone test was performed in 1999. Analysis in the 1997 EBD and 2005 PEA indicate no significant impacts due to chemical materials from any surf zone tests. The 2005 PEA states that, historically, a maximum of three surf zone tests were approved annually. It is assumed that this number represents the baseline.

Pyrotechnics and Small Boat Obscurant Testing

Pyrotechnics refers to the use of smoke grenades, which are also used during obscurant testing. The effects of chemical materials released from smoke grenades were described in the *Estuarine and Riverine Areas Final Programmatic Environmental Assessment* (U.S. Air Force, 2004). The maximum annual number of smoke grenades analyzed in that document was 680 which, according to the 2006 EBD, included missions on SRI. The Estuarine and Riverine PEA concluded that there would not be significant adverse effects to air quality, water quality, or sediments due to chemicals in the dyes. Concentrations required to affect air quality would rapidly dissipate. The dyes have limited solubility in water and would quickly disperse to nonimpactive levels. Dyes would not stay in the air or water but would be bound to soil and sediments. Once in the sediments, the extent of the effect of the dyes on sediment quality and on animals that live in the sediments would depend on the concentration, the availability of the dye to organisms, and the feeding and respiration mechanisms of organisms that live in the sediments. Chemical properties of the dyes, such as the solubilities and partition coefficients, indicate that once dyes are input into the environment, they will be absorbed or adhere to soil or sediments. Because they would be tightly bound to sediments, they would not be readily available to animals that live and feed in the water column. The degree to which the dyes move through the environment depends on how the sediments to which they are attached migrate.

According to the 2006 EBD, danger to personnel involved in training missions utilizing colored smokes is considered minimal if use is in accordance with standard procedures and current mitigations, and with conversion of smoke material to less toxic smokes. Air Force procedures call for use of smoke grenades by qualified instructors only and for the throwing of smoke grenades in a direction so that the wind will dissipate the vapor away from personnel.

Debris

Debris such as cartridges, canisters from smokes, chaff, and flares, as well as litter and refuse from ground troop movement, may be deposited from ground troop activities. If these items are left in place and not properly disposed of or packed out, the debris and refuse has the potential to cause adverse environmental impacts. AACI 32-7003 and AFI 32-7086 Supplement I should be

adhered to during training activities for recycling, hazardous materials management, and proper disposal of wastes.

Debris also includes items from missions such as gunnery, shrapnel, and flare chutes. This type of debris is essentially considered litter. AACI 32-7003 and AFI 32-7086 Supplement I should be adhered to during training activities for recycling, hazardous materials management, and proper waste disposal. Many units operate under a policy of post-mission cleanup, so debris that is left behind is likely unintentional, accidental, or the result of an item simply being irretrievable or lost. Nonenforcement of cleanup policies, particularly for visiting units, may account for other instances where debris is not picked up. Given the clean-up policies in place and the presence of recreational and public users within the SRI ROI, debris from military missions likely constitutes a minor percentage of total debris deposited in the island and marine areas.

Direct physical impacts (DPIs) to humans or wildlife may result from falling missile debris. Debris from an early flight termination is expected to fall within the launch hazard area, which for the PATRIOT missile is a radius of 6,000 feet centered on the launch pad. Limited damage to vegetation may be anticipated from falling missile debris fragments. The potential for wildlife to be physically struck by falling missile debris is considered remote.

The 2005 PEA evaluated potential debris deposition due to a Caesar Trumpet launch. Although this type of missile is expected to be replaced with PATRIOT missiles in the future, the analysis is considered pertinent. Specific debris patterns and fragment sizes are unknown, but for the purposes of analysis, the assumption is made that missile debris consists of individual 5-pound fragments. For one launch event, the total number of 5-pound pieces could be 352 fragments (Table 4-1) spread out over 4 square miles, or approximately 88 fragments per square mile. Using this dispersion factor, a maximum event total of 352 debris fragments equates to 0.00000316 DPI per square foot area.

Table 4-1. Potential Debris Fragments from Surface-to-Air Missile Launches

Missile	Total Weight (lbs)	Debris Weight (lbs)	Cumulative Debris Weight (max. lbs/event)	5-lb Debris Fragments (#/event)
PATRIOT	2,003	1,755	1,755	351
Caesar Trumpet	2,000	1,760	1,760	352
Viper IIIA	94	37	37	5

Source: U.S. Air Force, 2005; lb(s) = pounds

Direct impacts to sensitive species resulting from falling missile debris fragments (early flight termination) are anticipated to be insignificant, due to the relatively infrequent nature of missile launch events, the large spatial area for potential fragments to occur, and the unlikelihood of an early flight termination occurring.

Management requirements for debris include the mandatory cleanup of debris at test sites, which should be conducted according to regulations concerning debris and hazardous materials. Debris from air-dropped live ordnance is not expected to occur in the surf zone portion of the ROI because all live ordnance will normally be dropped into the EGTRR beyond the 100-fathom line (approximately 30 miles from shore).

Environmental Restoration Program Sites

Several closed ERP sites, AOCs, and POIs occur on Santa Rosa Island; however, there is an Internal Land Use control on POI-405. POI-405 consists of three separate areas located in the proposed testing and training area at A-15. The controls restrict any soil disturbance in the three areas. The southernmost area of POI-405 is partially covered by an asphalt pad. The uncovered part remains under a soil disturbance restriction for aerial or water crafts. The remaining two areas will be marked with sign in the near future. Adherence to LUCs and coordination with Eglin AFB's Environmental Restoration Section would be required for all testing and training exercises. Therefore, potentially hazardous materials would not come into contact with mission personnel or be introduced into wetlands or marine waters. If mission personnel should encounter soil that is discolored or has a chemical odor or unusual debris during any ground training operations, the personnel should immediately notify the Environmental Restoration Section.

4.1.2 Alternative 1

Chemical Materials

Under Alternative 1, the quantity of expendables associated with baseline activities is identified and analyzed (Section 2.2). The potential effects of chemical materials associated with munitions use, missile launches, ground maneuvers, air operations, surf zone testing, small boat obscurant testing, and pyrotechnics are described below, including quantification of expendables where appropriate.

Munitions Use

Munitions use includes inert (blank) small arms fire and 30-mm rounds fired from LCACs. Approximately 750,000 small arms cartridges and 353 30-mm rounds would be expended under this alternative. Eglin AFB requires that casings from small arms munitions be picked up after missions, although some casings are not retrieved.

The environmental effects of small arms expenditures were analyzed in the 2005 PEA, including standard 7.62-mm munitions and nonlead frangible 5.56-mm munitions. Although live fire was analyzed, current practice is to use only blank cartridges on the island, and all small arms munitions in the RUR are assumed to be blanks. Therefore, during small arms missions, brass (70 percent copper and 30 percent zinc) shell cases left on the island would be the primary issue. The number of shell cases left on the island is unknown, although the 2005 PEA assumed that 60 percent would be retrieved. The chemical input from the remaining corroding brass is considered insignificant because brass undergoes slow corrosion, even in salty environments. A slow release of copper and zinc ions would result from brass corrosion. The 30-mm rounds used in LCAC training are all inert (live rounds would only be used on a case-by-case basis approved through the AFF 813 process), and expended cartridges stay on the LCAC.

There would be no significant adverse effects within the SRI ROI due to chemical contamination of soil, water, or biota.

Missile Launches

Analysis of combustive pollutant emissions presented in the *Environmental Assessment for Projected Patriot Testing (Five-Year Plan)* (U.S. Air Force, 2002a) concluded there would be no significant impacts to the environment for up to 20 PATRIOT missile launches per year. Up to three such launches could occur under Alternative 1; environmental impacts would therefore not be significant. Missile debris is evaluated below under “Debris.”

Ground Testing and Training

Components of flare combustion residue are the primary chemical materials produced by ground maneuvers. Prior analysis in the 1997 SRI EBD determined that up to 67,000 flares could be released in a peak hour without adverse health effects to people or wildlife. For a typical target area of 10,000 acres, 220,000 flares could be released annually without significantly increasing short- or long-term health risks from hexavalent chromium or lead, the primary constituents of concern in flare residue. The use of only approximately 300 flares is proposed under Alternative 1. Flare use is not considered to pose significant adverse effects to the environment.

Air Operations

Air operations pertinent to this analysis consist of aircraft supporting OA-HITL testing, helicopter flights, and landings and paratroop drops. Other types of aircraft sorties were not analyzed in the 2005 SRI PEA. The low number of aircraft used in missions over the SRI ROI is considered to produce a minimal amount of combustive emissions, with only local and temporary effects on air quality.

Surf Zone Testing

Surf zone tests that involve live detonations are not part of this alternative. Any new surf zone detonations will require a separate environmental analysis through the Air Force 813 process. Tests such as ALRT would not result in deposition of chemical materials in the surf zone.

Pyrotechnics and Small Boat Obscurant Testing

Pyrotechnics refers to the use of smoke grenades. The effects of chemical materials released from smoke grenades were described in the *Estuarine and Riverine Areas Final Programmatic Environmental Assessment* (U.S. Air Force, 2004). The maximum annual number of smoke grenades analyzed in that document was 680 which, according to the 2006 EBD, included missions on SRI. Up to 571 smoke grenades could be used under Alternative 1 of this REA. The Estuarine and Riverine PEA concluded that there would not be significant adverse effects to air quality, water quality, or sediments due to chemicals in the dyes. Concentrations required to affect air quality would rapidly dissipate. The dyes have limited solubility in water and would quickly disperse to nonimpactive levels. Dyes would not stay in the air or water but would be bound to soil and sediments. Once in the sediments, the extent of the effect of the dyes on sediment quality and on animals that live in the sediments would depend on the concentration, the availability of the dye to organisms, and the feeding and respiration mechanisms of organisms that live in the sediments. Chemical properties of the dyes, such as the solubilities and partition coefficients, indicate that once dyes are input into the environment, they will be

absorbed or adhere to soil or sediments. Because they would be tightly bound to sediments, they would not be readily available to animals that live and feed in the water column. The degree to which the dyes move through the environment depends on how the sediments to which they are attached migrate.

According to the 2006 EBD, danger to personnel involved in training missions utilizing colored smokes is considered minimal if use is in accordance with standard procedures and current mitigations, and with conversion of smoke material to less toxic smokes. Air Force procedures call for use of smoke grenades by qualified instructors only and for the throwing of smoke grenades in a direction so that the wind will dissipate the vapor away from personnel.

Debris

Debris would be similar to that described under the No Action Alternative and would include items such as cartridges, canisters from smokes, chaff, and flares, as well as litter and refuse from ground troop movement. If these items are left in place and not properly disposed of or packed out, the debris and refuse has the potential to cause adverse environmental impacts. AACI 32-7003 and AFI 32-7086 Supplement I should be adhered to during training activities for recycling, hazardous materials management, and proper disposal of wastes.

Debris also includes items from missions such as gunnery, shrapnel, and flare chutes. This type of debris is essentially considered litter. AACI 32-7003 and AFI 32-7086 Supplement I should be adhered to during training activities for recycling, hazardous materials management, and proper waste disposal. Many units operate under a policy of post-mission cleanup, so debris that is left behind is likely unintentional, accidental, or the result of an item simply being irretrievable or lost. Nonenforcement of cleanup policies, particularly for visiting units, may account for other instances where debris is not picked up. Given the clean-up policies in place and the presence of recreational and public users within the SRI ROI, debris from military missions likely constitutes a minor percentage of total debris deposited in the island and marine areas.

DPIs to humans or wildlife may result from falling missile debris. Debris from an early flight termination is expected to fall within the launch hazard area, which for the PATRIOT missile is a radius of 6,000 feet centered on the launch pad. Limited damage to vegetation may be anticipated from falling missile debris fragments. The potential for wildlife to be physically struck by falling missile debris is considered remote.

The 2005 PEA evaluated potential debris deposition due to a Caesar Trumpet launch. Although this type of missile is expected to be replaced with PATRIOT missiles in the future, the analysis is considered pertinent. Specific debris patterns and fragment sizes are unknown, but for the purposes of analysis, the assumption is that missile debris consists of individual 5-pound fragments. For one launch event, the total number of 5-pound pieces could be 352 fragments spread out over 4 square miles, or approximately 88 fragments per square mile. Up to three PATRIOT missile launches could occur per year under Alternative 1.

Direct impacts to sensitive species resulting from falling missile debris fragments (early flight termination) are anticipated to be insignificant due to the relatively infrequent nature of missile

launch events, the large spatial area for potential fragments to occur, and the unlikelihood of an early flight termination occurring.

Management requirements for debris include the mandatory cleanup of debris at test sites, which should be conducted according to regulations concerning debris and hazardous materials. Debris from air-dropped live ordnance is not expected to occur in the surf zone portion of the ROI because all live ordnance will normally be dropped into the EGTRR beyond the 100-fathom line (approximately 30 miles from shore).

Environmental Restoration Program Sites

Several closed ERP sites, AOCs, and POIs occur on Santa Rosa Island; however, there is an Internal Land Use control on POI-405. POI-405 consists of three separate areas located in the proposed testing and training area at A-15. The controls restrict any soil disturbance in the three areas. The southernmost area of POI-405 is partially covered by an asphalt pad. The uncovered part remains under a soil disturbance restriction for aerial or water crafts. The remaining two areas will be marked with sign in the near future. Adherence to LUCs and coordination with Eglin AFB's Environmental Restoration Section would be required for all testing and training exercises. Therefore, potentially hazardous materials would not come into contact with mission personnel or be introduced into wetlands or marine waters. If mission personnel should encounter soil that is discolored or has a chemical odor or unusual debris during any ground training operations, the personnel should immediately notify the Environmental Restoration Section.

4.1.3 Alternative 2

Chemical Materials

Munitions Use

Up to 3,138,304 small arms cartridges and 1,412 30-mm rounds could be expended under this alternative. Since units are required to retrieve brass casings, there would be no significant adverse effects within the SRI ROI due to chemical contamination of soil, water, or biota.

Missile Launches

Analysis of combustive pollutant emissions presented in the *Environmental Assessment for Projected Patriot Testing (Five-Year Plan)* (U.S. Air Force, 2002a) concluded there would be no significant impacts to the environment for up to 20 PATRIOT missile launches per year. Up to 12 such launches could occur under Alternative 1; environmental impacts would therefore not be significant. Missile debris is evaluated below under "Debris."

Ground Testing and Training

Components of flare combustion residue are the primary chemical materials produced by ground maneuvers. Prior analysis in the 1997 SRI EBD determined that up to 67,000 flares could be released in a peak hour without adverse health effects to people or wildlife. For a typical target area of 10,000 acres, 220,000 flares could be released annually without significantly increasing

short- or long-term health risks from hexavalent chromium or lead, the primary constituents of concern in flare residue. Up to 1,232 flares could be used under Alternative 2. Flare use is not considered to pose significant adverse effects to the environment.

Air Operations

Air operations pertinent to this analysis consist of aircraft supporting OA-HITL testing, helicopter flights, and landings and paratroop drops. Other types of aircraft sorties were not analyzed in the 2005 SRI PEA. The low number of aircraft used in missions over the SRI ROI is considered to produce a minimal amount of combustive emissions, with only local and temporary effects on air quality.

Surf Zone Testing

Alternative 2 does not include live surf zone detonations. Any missions of this nature would require a separate analysis and approval through the Air Force 813 process.

Pyrotechnics and Small Boat Obscurant Testing

Up to 2,284 smoke grenades could be used under Alternative 2 of this REA. The Estuarine and Riverine PEA concluded that there would not be significant adverse effects to air quality, water quality, or sediments due to chemicals in the dyes. Concentrations required to affect air quality would rapidly dissipate. The dyes have limited solubility in water and would quickly disperse to nonimpactive levels. Dyes would not stay in the air or water but would be bound to soil and sediments. Once in the sediments, the extent of the effect of the dyes on sediment quality and on animals that live in the sediments would depend on the concentration, the availability of the dye to organisms, and the feeding and respiration mechanisms of organisms that live in the sediments. Chemical properties of the dyes, such as the solubilities and partition coefficients, indicate that once dyes are input into the environment, they will be absorbed or adhere to soil or sediments. Because they would be tightly bound to sediments, they would not be readily available to animals that live and feed in the water column. The degree to which the dyes move through the environment depends on how the sediments to which they are attached migrate.

According to the 2006 EBD, danger to personnel involved in training missions utilizing colored smokes is considered minimal if use is in accordance with standard procedures and current mitigations, and with conversion of smoke material to less toxic smokes. Air Force procedures call for use of smoke grenades by qualified instructors only and for the throwing of smoke grenades in a direction so that the wind will dissipate the vapor away from personnel.

Debris

Debris would be similar in nature but potentially twice as much as that described under Alternative 1 and would include items such as cartridges, canisters from smokes, chaff, and flares, as well as litter and refuse from ground troop movement. If these items are left in place and not properly disposed of or packed out, the debris and refuse has the potential to cause adverse environmental impacts, or affect mission sustainability. AACI 32-7003 and AFI 32-7086 Supplement I should be adhered to during training activities for recycling, hazardous materials management, and proper disposal of wastes.

Debris also includes items from missions such as gunnery, shrapnel, and flare chutes. This type of debris is essentially considered litter. AACI 32-7003 and AFI 32-7086 Supplement I should be adhered to during training activities for recycling, hazardous materials management, and proper waste disposal. Many units operate under a policy of post-mission cleanup, so debris that is left behind is likely unintentional, accidental, or the result of an item simply being irretrievable or lost. Nonenforcement of cleanup policies, particularly for visiting units, may account for other instances where debris is not picked up. Given the clean-up policies in place and the presence of recreational and public users within the SRI ROI, debris from military missions likely constitutes a minor percentage of total debris deposited in the island and marine areas.

Direct physical impacts (DPI) to humans or wildlife may result from falling missile debris. Debris from an early flight termination is expected to fall within the launch hazard area, which for the PATRIOT missile is a radius of 6,000 feet centered on the launch pad. Limited damage to vegetation may be anticipated from falling missile debris fragments. The potential for wildlife to be physically struck by falling missile debris is considered remote.

The 2005 PEA evaluated potential debris deposition due to a Caesar Trumpet launch. Although this type of missile is expected to be replaced with PATRIOT missiles in the future, the analysis is considered pertinent. Specific debris patterns and fragment sizes are unknown, but for the purposes of analysis, the assumption is that missile debris consists of individual 5-pound fragments. For one launch event, the total number of 5-pound pieces could be 352 fragments spread out over 4 square miles, or approximately 88 fragments per square mile. Up to 12 PATRIOT missile launches could occur per year under Alternative 2.

Direct impacts to sensitive species resulting from falling missile debris fragments (early flight termination) are anticipated to be insignificant due to the relatively infrequent nature of missile launch events, the large spatial area for potential fragments to occur, and the unlikelihood of an early flight termination occurring.

Management requirements for debris include the mandatory cleanup of debris at test sites, which should be conducted according to regulations concerning debris and hazardous materials. Debris from air-dropped live ordnance is not expected to occur in the surf zone portion of the ROI because all live ordnance is dropped into the EGTRR beyond the 100-fathom line (approximately 30 miles from shore).

Environmental Restoration Program Sites

Several closed ERP sites, AOCs, and POIs occur on Santa Rosa Island; however, there is an Internal Land Use control on POI-405. POI-405 consists of three separate areas located in the proposed testing and training area at A-15. The controls restrict any soil disturbance in the three areas. The southernmost area of POI-405 is partially covered by an asphalt pad. The uncovered part remains under a soil disturbance restriction for aerial or water crafts. The remaining two areas will be marked with sign in the near future. Adherence to LUCs and coordination with Eglin AFB's Environmental Restoration Section would be required for all testing and training exercises. Therefore, potentially hazardous materials would not come into contact with mission personnel or be introduced into wetlands or marine waters. If mission personnel should encounter soil that is discolored or has a chemical odor or unusual debris during any ground

training operations, the personnel should immediately notify the Environmental Restoration Section.

4.2 SOILS

Activities that may potentially affect soil resources include ground maneuvers, LCAC crossings, and surf zone testing. Ground maneuvers and LCAC crossings would primarily affect terrestrial soils, while surf zone testing would affect terrestrial soils and marine sediments.

4.2.1 No Action Alternative

Ground Testing and Training

The 2006 EBD identifies the following ground operation activities as having the potential to impact soil resources:

- Changing (lowering) the elevation or contours of dunes
- Dune fencing
- Mine warfare actions: placing mines, other obstacles; digging trenches
- Digging up, creating furrows in, or compacting sand in front of dune line
- Lowering sediment quality
- Hazardous materials disposal or spills (fuel, propellants)
- Off-road vehicle use

The 2006 EBD also indicates that missions occurring on SRI between FY95 and FY05, as well as testing of a previously buried cable, did not significantly affect the soil environment long-term. Ground training activities may have slightly altered the soil environment, resulting in some temporary compaction, especially in situations involving heavy vehicles. These training activities likely had a minimal effect, with full recovery occurring within 1 year. Included in ground maneuvers is Los Banos Training, Advanced Skills Training, and HAVE ACE activities, each of which occurs 12 times per year for a total of 36 exercises. Additional ground movement activities may occur.

Wheeled vehicles may be used on SRI as troop transport, perimeter guards, or for other transport. Wheeled vehicles may move laterally along the beach face from below the mean high water line to within 50 feet of the primary dune line, across the island at crossing corridors, from the shore to the road at designated areas, and at other designated areas. Destruction of dune vegetation would have adverse impacts to the beach environment by destabilizing dunes and making them susceptible to wind and storm event erosion. Consequently, all wheeled vehicles must remain off dunes higher than five feet high.

Although infrequent, helicopter landings occur on SRI. For example, helicopters are used during Los Banos training exercises. Significant erosion could result from the rotor downwash. When possible, helicopter landings should be minimized because these areas become more vulnerable

to storm surge washover. Additionally, only established landing zones should be used for landings. Helicopter landings during Los Banos activities occur at a large paved area, which decreases the potential for soil impacts.

Troops would potentially walk on SRI in shoreline and interstitial areas during ground training. Dune habitat is sensitive to disturbance and destruction of dune vegetation can adversely affect the dune environment, resulting in erosion of dunes and accelerated island dynamics. As a result, troops would avoid walking on established dunes over five feet in height. Provided these procedures are adhered to, troop movement would not create significant erosion problems.

Tracked vehicles may also be used on SRI, although this type of activity has not occurred recently and has only been associated with Amphibious Ready Group/Marine Expeditionary Unit training. Tracked vehicles may displace large amounts of sand when moving at high speed, essentially creating a spray of sand. No data are available regarding the actual amount of displacement from an individual vehicle. Post-mission monitoring would be needed to determine the extent of sand displacement, and appropriate strategies to minimize impacts would be employed.

Shoreline erosion impacts associated with landing and returning to the water on the Gulf side are not anticipated, as the Gulf-side shoreline of the island is a high-energy environment with a constantly shifting profile. Of more concern is the sound side of the island, which is typically protected from erosion by vegetation, is low energy, and has more silty sediments that are not as readily shifting as more sandy sediments. When landing and returning on the sound side of the island, tracked vehicles would transit through designated corridors. Management practices would be employed during all tracked vehicle use.

LCAC Crossings

The LCAC crossing zones established on SRI are relatively flat areas with minimal vegetation. An LCAC dune crossing study identified in the 2005 PEA concluded that a maximum of 0.75 inches of sand was displaced after two consecutive passes within the same vicinity, with little to no impacts to dune vegetation. The number of LCAC missions under the No Action Alternative is currently unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further LCAC operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts to soil. If a large number of crossings occurred within a short time, it can be reasonably assumed that sand would be displaced in the area, with heavy use resulting in an increased potential for storm surge washout. However, the barrier island is a dynamic environment, with constantly shifting sands and topography resulting from coastal breezes. Therefore, it is anticipated that the typical winds would eliminate most of the footprint caused by the LCAC flyover activity in a short period of time. These maneuvers are not anticipated to result in adverse impacts to soils, as these craft are essentially hovercraft. Erosion impacts from LCAC use are not anticipated. It should be pointed out that LCAC crossing sites were established prior to the most recent hurricanes. If LCAC activities are scheduled in the future, the sites should be evaluated for changes in beach morphology and vegetation due to the storms. It is conceivable that new crossing sites might need to be established.

Surf Zone Testing

The 2006 EBD identifies the following aspects of surf zone testing as potentially affecting soil and sediment resources on SRI:

- Changing (lowering) the elevation of dunes.
- Digging up, creating furrows in, or compacting sand in front of dune line.
- Lowering sediment quality.
- Hazardous materials disposal or spills (fuel, propellants).
- Subtidal profile alteration.

Historically, surf zone tests have not been conducted on the dunes, but test support vehicles including armored personnel carriers have crossed over the dunes at designated points. Actual tests within the surf zone test area would not affect the dunes. Though part of the baseline of the No Action, any surf zone tests involving live detonations will require a separate environmental analysis and routing through the Air Force 813 process.

4.2.2 Alternative 1

Ground Testing and Training

The types of ground maneuvers and the associated potential impacts under Alternative 1 would be the same as those evaluated under the No Action Alternative. Currently, ground maneuvers include Los Banos Training, Advanced Skills Training, and HAVE ACE activities, each of which occurs 12 times per year for a total of 36 exercises. Increase in the number of missions under Alternative 1 is unknown. Wheeled vehicle operation would not have significant impacts to soil resources if management requirements are followed, including staying 50 feet from the primary dune line and staying off dunes greater than five feet in height. Helicopter landings should occur at designated landing zones to the extent feasible. Troops should avoid walking on established dunes over 5 feet in height. Impact minimization strategies and post-mission monitoring would likely be required for tracked vehicle use on the island.

LCAC Crossings

Potential effects to soil resources from LCAC crossovers are the same as those described under the No Action Alternative. The number of LCAC missions under this alternative is unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further LCAC operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts. If a large number of crossings occurred within a short time, sand displacement could occur, resulting in an increased potential for storm surge washout. However, the dynamic barrier island environment would eliminate most of the footprint caused by the LCAC flyover activity in a short period of time. These maneuvers are not anticipated to result in adverse impacts to soils, as these craft are essentially hovercraft. Erosion impacts from LCAC use are not anticipated. It should be noted that the LCAC crossing site was established prior to the most recent hurricanes. If LCAC activities are scheduled in the future, the site should be evaluated for changes in beach morphology and

vegetation due to the storms. It is conceivable that new crossing sites might need to be established.

Surf Zone Testing

No live surf zone detonations are proposed under Alternative 1, though inert activities such as ALRT do occur within the surf zone and are part of the baseline. These can result in temporary disturbance to sediment and beach contours, rutting, and compaction. Any disturbance to beach and surf zone contours would be temporary, and as necessary disturbed surfaces would be restored to their original state.

4.2.3 Alternative 2

Ground Testing and Training

The types of ground maneuvers and the associated potential impacts under Alternative 2 would be the same as those evaluated under the previous alternatives. Currently, ground maneuvers include Los Banos Training, Advanced Skills Training, and HAVE ACE activities, each of which occurs 12 times per year for a total of 36 exercises. Under Alternative 2, these ground movement exercises would increase to 108 exercises per year. Wheeled vehicle operation would not have significant impacts to soil resources if management requirements are followed, including staying 50 feet from the primary dune line and staying off dunes greater than five feet in height. Helicopter landings should occur at designated landing zones to the extent feasible. Troops should avoid walking on established dunes over five feet in height. Impact minimization strategies and post-mission monitoring would likely be required for tracked vehicle use on the island.

LCAC Crossings

Potential effects to soil resources from LCAC crossovers are the same as those described under the previous alternatives. The number of LCAC missions under this alternative is unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further LCAC operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts. If a large number of crossings occurred within a short time, sand displacement could occur, resulting in an increased potential for storm surge washout. However, the dynamic barrier island environment would eliminate most of the footprint caused by the LCAC flyover activity in a short period of time. These maneuvers are not anticipated to result in adverse impacts to soils, as these craft are essentially hovercraft. Erosion impacts from LCAC use are not anticipated. It should be noted that the LCAC crossing site was established prior to the most recent hurricanes. If LCAC activities are scheduled in the future, the site should be evaluated for changes in beach morphology and vegetation due to the storms.

Surf Zone Testing

No live surf zone detonations are proposed, though inert activities such as ALRT do occur within the surf zone and are proposed under Alternative 2. These missions can result in temporary disturbance to sediment and beach contours, and rutting and compaction of sands. Any

disturbance to beach and surf zone contours would be temporary, and as necessary disturbed surfaces would be restored to their original state.

4.3 WATER RESOURCES

Potential impacts to water resources are provided for activities approved in the 2005 PEA. These activities represent the baseline conditions contained of the No Action Alternative in this REA. Analysis is provided for surface and subsurface waters, wetlands, and floodplains.

4.3.1 No Action Alternative

Surface and Subsurface Waters

Impacts to surface waters could potentially result from several types of activities, including ground training, 30-mm guns, flares, surf zone testing, obscurants, and amphibious assault exercises. The primary water quality concerns for SRI missions are potential turbidity changes and introduced of metals into the Gulf from ammunition and flares. No changes to pH or nutrient levels are anticipated. The information provided below is based on analyses conducted for the 2005 PEA.

Ground Training

Troop movement and bivouac during ground training would potentially generate graywater, which is shower and sink wash water produced from field operations. Eglin AFB requires that graywater wastes generated on SRI be disposed of properly. Existing Eglin AFB procedures for managing sewage and kitchen wastes would eliminate any potential effects on ground and surface waters. Wastewater from field kitchens would be contained and transported to on-base or off-base wastewater plants, but collection of field shower water is not required since no water quality issues are associated with this type of graywater. Portable latrines will be provided at appropriate locations. Coordination with the 96 Civil Engineering Group at Eglin AFB would ensure that these requirements are met.

Dispersed troop maneuvers through water bodies are not anticipated to impact water quality. Large troop maneuvers would avoid wetland vegetation, and digging would be avoided near water bodies. Provided these minimization procedures are adhered to, troop movement is not anticipated to impact water quality on SRI.

Vehicles would remain on designated roads for most operations. However, in certain cases vehicles could be maneuvered along the shoreline and cross the island. This type of activity was analyzed in the 2005 PEA for A-13B. Along the shoreline, turbidity impacts would not be anticipated. At the crossover site, routes would be chosen so that wetlands are avoided.

30-mm Guns

Most or all of 30-mm rounds are expected to be inert (live rounds would only be used on a case-by-case basis approved through the AFF 813 process), and casings generally fall within the LCAC. However, the 2005 PEA provides analysis of potential live fire. The amount of steel and

aluminum debris that could be deposited in the Gulf of Mexico from LCAC 30-mm firing operations is approximately 0.8201 pounds per round. By comparison, hundreds of tons of artificial reef materials are placed in nearshore waters of the Gulf. LCAC 30-mm testing and training would increase the total amount of iron and aluminum debris to the marine environment, releasing insoluble iron oxides and iron hydroxides to the water column. However, dispersion in the water column and the slow rate of oxidation would reduce any impacts on water quality.

The increase in iron deposition is not expected to cause the water quality in the Gulf to approach the concentration of 300 µg/L that is considered detrimental to the marine environment. Aluminum from 30-mm projectiles deposited in the marine or terrestrial environment is not in a chemical form that is readily leached for environmental transport or exposure. The 2005 PEA identifies studies conducted with aluminum chaff (which has larger surface area and is more readily available than 30-mm cartridges) showing that exposed aquatic organisms have not demonstrated toxic effects even when exposed to abnormally high concentrations of aluminum.

Flares

The 2005 PEA identified carbon, magnesium products, and aluminum as the significant chemical products from flare utilization. Carbon and graphite are nontoxic and are physiologically inert. Magnesium in flare residue is relatively nontoxic by ingestion and is not toxic to aquatic biota. Aluminum from flare cartridges is in a form that is not readily available for chemical leaching and transport and is not available for biological uptake. Some flares are ejected by pyrotechnic devices or initiation devices that contain chromium and/or lead compounds. Chromium and lead are listed as hazardous air pollutants under the Clean Air Act. However, analysis in the 2005 PEA determined that up to 67,000 flares could be released in a peak hour without significantly increasing short- or long-term health risks from hexavalent chromium or lead. For a typical target area (considered to be 10,000 acres in the 2005 PEA), 220,000 flares could be released annually without significantly increasing health risks. The nontoxic nature of major chemical combustion products from flare use and the dispersion of marine waters suggest that current flare usage does not harm the biological environment or threatened and endangered species.

Surf Zone Testing

Surf zone detonations, though part of the baseline activities historically conducted on SRI, would require a separate analysis and approval through the Air Force 813 process, even upon selection of the No Action. There would be no chemical by-products from inert surf zone tests.

Obscurant Use

The composition of a smoke grenade is approximately 1,200 grams of brass flakes for infrared obscurant (M-76) or 900 grams titanium dioxide (TiO₂) for visual obscurant (M-82). The 2005 PEA concluded that 317 pounds (144 kilograms) of TiO₂ and 185 pounds (84 kilograms) of brass flakes would be expended due to obscurant use, although M-18 smoke grenades are primarily proposed for use under the No Action Alternative.

Boat smokes will increase the release of brass flakes to the atmosphere and ultimately to the marine environment. Brass will dissociate into copper and zinc more rapidly in saltwater than freshwater; in addition, copper and zinc will reach equilibrium more quickly. Brass, copper, and zinc adsorb to particulate matter in the water column and eventually settle with sedimentation. Some copper flakes less than 0.45 microns will become colloidal. The adsorption of copper to sediment creates precipitates such as hydroxide complexes, phosphates, and sulfides. Zinc forms precipitates as a sulfide and co-precipitates with calcium carbonate and iron hydroxide.

Copper can accumulate in marine sediments to toxic concentrations. Benthic organisms such as mollusks, arthropods, and nematodes could ingest copper and brass particles in suspended sediment to be ionized in the gut. Filter feeders could adsorb dissolved copper and zinc through the gill membranes, causing difficulties in gas exchange. The U.S. Environmental Protection Agency (USEPA) set water quality standards for copper limit saltwater environments to an average 24-hour concentration of 5.6 mg/L with a maximum exposure limit of 23 mg/L at any time (as cited in U.S. Air Force, 2005). Brass released over the surf zone from boat smokes, within the limits of the ROI, would be dispersed in the air over a large area and would be dispersed rapidly in the water column when settled. These factors allow brass and copper concentrations in the water column to be small on initial contact, and even smaller with dispersion. The relative infrequency and scattered operation of boat smokes would not allow high concentrations of copper and zinc to accumulate in the sediments from these operations.

Titanium dioxide would be released into the atmosphere over the surf zone from smoke grenades. Particulate titanium oxides would be deposited on the surface of marine waters in the ROI. Titanium oxide was ranked nontoxic by the USEPA Chemical Scoring System for Hazard and Exposure Identification (as cited in U.S. Air Force, 2005). Titanium oxides are insoluble in water and will adsorb to particles and sediments. The 2005 PEA states that there appears to be an intestinal barrier to the adsorption of ingested insoluble titanium in mammals and other vertebrates, which makes it nontoxic to plants and small mammals. Titanium dioxide is not expected to cause significant harm to ecological receptors in the ROI.

Amphibious Assaults

Large scale amphibious assaults, which have only been associated with Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) activities in the past, involve the use of LCACs, landing craft utility (LCU) vehicles, AAVs, and Zodiac® boats at the land-water interface. The likelihood of such activities occurring in the future is unknown; however, potential impacts are analyzed in this section. The number of amphibious assault operations under the No Action Alternative is unknown. Major amphibious exercises like the ARG/MEU have not occurred on SRI since 2002, and there are currently no plans for further major amphibious exercises. It is anticipated that any future amphibious missions will involve moderate use of the island, and are expected to result in little to no impacts. The use of Zodiacs is relatively benign. Small boat operations would temporarily affect turbidity at the landing site, but would have no lasting or significant effects due to quick dispersal of materials in the water column. LCAC landings are not anticipated to result in adverse impacts to water quality, as these craft are essentially hovercraft. As with all watercraft, some minimal residual petroleum products may be released from boats and amphibious craft, but the amount would not be significant.

LCU landings may occur offshore from SRI. The LCU has a 7-foot draft and would be required to stop offshore when waters became too shallow. This craft is likely to impact bottom sediments and create turbidity. Offloading of vehicles from the LCU and their movement to the shore would also increase water column turbidity. However, the resulting turbidity would be short-term (less than 1 day) and localized.

AAV landings and returns to the water may occur on both the Gulf and sound sides of the island, along with lateral movements of the vehicles and cross-island maneuvers. AAVs would displace large amounts of sand when moving at high rates of speed and would churn up bottom sediments upon landings and returns. During preparation of the 2005 PEA, no data were available regarding the actual amount of displacement from an individual AAV; however, the amount may be substantial given the number of vehicles that could operate on the island during ARG/MEU training. Post-mission monitoring would be needed to assess turbidity changes caused by AAV activities.

Shoreline turbidity associated with AAV landing and returning to the water on the Gulf side is expected to be minimal, as the Gulf-side shoreline of the island is a high-energy environment with a constantly shifting profile. The sound side of the island is of greater concern because it is typically protected from erosion by vegetation, is low energy, and has more silty sediments that do not shift as readily as sandy sediments. Measures to reduce potential shoreline erosion could be required for activities involving AAVs. Disturbance of bottom sediments on the sound side of the island, with associated changes in turbidity and dissolved oxygen, would be temporary and localized, and levels would be anticipated to return to normal within a day.

Wetlands

Multiple small wetlands are located across SRI (Figure 3-3). Impacts to wetlands could potentially occur as a result of destruction or degradation. The 2005 PEA identified troop and vehicle movements on the island as the primary activities that could impact wetlands. For most operations, vehicles would remain on established roads and would therefore not impact wetlands. However, in certain situations, vehicles and troops would need to move in areas without roads, creating the potential for wetlands to be impacted. In these cases, routes for vehicle movements would be selected so that wetlands are avoided. Occasional movement of small numbers of troops near or through wetland areas is not expected to result in significant impacts. Testing and training sites are typically selected based on avoidance of important environmental resources such as wetlands, and it would be possible in many cases to choose routes of troop movements to minimize disturbance to wetlands. Federal and state permits would be required for potential impacts to wetlands, specifically an FDEP Wetland Resource Management Permit and an Army Corps Dredge and Fill Permit. A Finding of No Practicable Alternative would also be required in accordance with EO 11990.

LCAC maneuver areas are located in areas devoid of wetlands. However, the LCAC corridors approved in the 2005 PEA pass through areas with wetlands. In most cases, these wetlands could be maneuvered around. Even if an LCAC were to pass over a wetland, no impacts would be anticipated due to the "hovercraft" nature of the vehicle. It should be noted that recent hurricanes could have altered the topography of LCAC crossing sites. If LCAC missions are conducted in the future, assessments of the previously approved corridors could be necessary.

The 2005 PEA analyzed potential crossing of SRI by AAVs (tracked vehicles) at A-13B during ARG/MEU exercises, which have not occurred for several years. Vehicle crossings at this site would have the potential to impact wetlands, even though avoidance measures would be taken. However, tracked or wheeled vehicle use in wetlands is not authorized by or included in the analysis of this EA. If ARG/MEU or other training exercises requiring vehicles to operate in wetlands are conducted again on SRI, separate NEPA analysis would be required, and management requirements would be implemented during all activities.

Floodplains

Executive Order 11988 requires examination of actions involving construction (i.e., buildings, roads) within a floodplain regarding 1) potential impacts to drainage patterns in the floodplain, and 2) the potential for people or structures to be impacted by flooding, in order to minimize or prevent loss of life and property. Almost all of SRI lies within the 100-year floodplain (Figure 3-3). However, none of the activities associated with the No Action Alternative involve construction, and thus there are no anticipated impacts to floodplains.

4.3.2 Alternative 1

Surface and Subsurface Waters

Ground Training

The types of ground training activities and the associated potential impacts under Alternative 1 would be the same as those evaluated under the No Action Alternative. Currently, ground maneuvers include Los Banos Training, Advanced Skills Training, and HAVE ACE activities, each of which occurs 12 times per year for a total of 36 exercises. Under Alternative 1, these ground movement exercises may increase, but the extent is unknown. Graywater waste generated during troop movement and bivouac would be disposed of according to existing Eglin AFB procedures. Coordination with the 96 Civil Engineering Group at Eglin AFB would ensure that these requirements are met.

Troop maneuvers through water bodies are not anticipated to impact water quality. Large troop maneuvers would avoid wetland vegetation, and digging would be avoided near water bodies. With these minimization procedures in place, troop movement is not anticipated to impact water quality on SRI.

Vehicles would remain on designated roads for most operations. However, in certain cases vehicles could be maneuvered along the shoreline and cross the island. This type of activity was analyzed in the 2005 PEA for A-13B. Along the shoreline, turbidity impacts would not be anticipated. At the crossover site, routes would be chosen so that wetlands are avoided.

30-mm Guns

Potential impacts to water resources resulting from 30-mm munitions would be the same as those evaluated under the No Action Alternative. Casings would be inert and generally be confined to the LCAC from which they were fired.

Flares

Analysis in the 2005 PEA determined that up to 220,000 flares could be released annually without significantly increasing health risks. Approximately 300 flares are included in Alternative 1. Significant impacts to water resources from flare use are not anticipated.

Surf Zone Testing

Live surf zone detonations would not be conducted under Alternative 1. Inert surf zone testing such as ALRT would not result in the deposition of contaminants into surface waters. Thus, there would be no impacts.

Obscurant Use

Obscurant use and potential impacts would be the same as that discussed under the No Action Alternative. Concentrations of obscurants would not reach levels that would have significant adverse impacts on water resources.

Amphibious Assaults

Under Alternative 1, potential impacts from amphibious assaults would be the same as those of the No Action Alternative.

Wetlands

Multiple wetlands occur across SRI (Figure 3-3). The 2005 PEA identified troop and vehicle movements on the island as the primary activities that could impact wetlands. These types of activities and the associated potential impacts would be the same as those evaluated under the No Action Alternative. Los Banos Training, Advanced Skills Training, and HAVE ACE activities each occur 12 times per year for a total of 36 exercises. Under Alternative 1, these exercises may increase, but the extent is unknown. For most operations, vehicles would remain on established roads. However, in certain situations, vehicles and troops would need to move in areas without roads, creating the potential for wetland impacts. In these cases, routes for vehicle movements would be selected so that wetlands are avoided. Occasional movement of small numbers of troops near or through wetlands is not expected to result in significant impacts. Testing and training sites are typically selected based on avoidance of important environmental resources such as wetlands, and it would be possible in many cases to choose routes of troop movements to minimize disturbance to wetlands. Federal and state permits would be required for potential impacts to wetlands, specifically an FDEP Wetland Resource Management Permit and an Army Corps Dredge and Fill Permit. A Finding of No Practicable Alternative would also be required in accordance with EO 11990.

LCAC maneuver areas are located in areas devoid of wetlands. However, the LCAC corridor approved in the 2005 PEA passes through areas with wetlands. In most cases, these wetlands could be avoided. Even if an LCAC were to pass over a wetland, no impacts would be anticipated due to the "hovercraft" nature of the vehicle. It should be noted that recent hurricanes could have altered the topography of the LCAC crossing site. If LCAC missions are conducted in the future, assessments of the previously approved corridors could be necessary.

The 2005 PEA evaluated crossing of SRI by vehicles at A-13B during ARG/MEU exercises, which have not occurred for several years. Vehicle crossings would have the potential to impact wetlands. However, vehicle use in wetlands is not authorized or considered part of the proposed actions of this EA. If ARG/MEU or other training exercises requiring vehicles to operate in wetlands are conducted again on SRI, separate NEPA analysis would be required, and management requirements would be implemented during all activities.

Floodplains

Executive Order 11988 requires examination of actions involving construction (i.e., buildings, roads) within a floodplain regarding 1) potential impacts to drainage patterns in the floodplain, and 2) the potential for people or structures to be impacted by flooding, in order to minimize or prevent loss of life and property. Almost all of SRI lies within the 100-year floodplain (Figure 3-3). However, none of the activities associated with Alternative 1 involve construction, and thus there are no anticipated impacts to floodplains.

4.3.3 Alternative 2

Surface and Subsurface Waters

Ground Training

The types of ground training activities and the associated potential impacts under Alternative 2 would be the same as those evaluated under the previous alternatives. Troop movements through water bodies are not anticipated to impact water quality. Large troop maneuvers would avoid wetland vegetation, and digging would be avoided near water bodies. With these minimization procedures in place, troop movement is not anticipated to impact water quality on SRI.

Vehicles would remain on designated roads for most operations. However, in certain cases vehicles could be maneuvered along the shoreline and cross the island. This type of activity was analyzed in the 2005 PEA for A-13B. Along the shoreline, turbidity impacts would not be anticipated. At the crossover site, routes would be chosen so that wetlands are avoided.

30-mm Guns

Potential impacts to water resources resulting from 30-mm munitions would slightly higher as those evaluated under the previous alternatives. The number of 30-mm projectiles would increase to a maximum of 1,412 under Alternative 2, a deposition of approximately 1158 lbs (.8201 x 1,412) of metal into the Gulf of Mexico. Dispersion in the water column and the slow rate of oxidation would reduce any impacts on water quality.

Flares

Up to 1,232 flares would be released under Alternative 2. Analysis in the 2005 PEA determined that up to 220,000 flares could be released annually without significantly increasing health risks.

Surf Zone Testing

Surf zone testing under Alternative 2 would consist of inert missions, but no detonations. Thus, no contaminants would be produced and water quality would not be affected.

Obscurant Use

Obscurant use and potential impacts would be the same as that discussed under the No Action Alternative and Alternative 1. Concentrations of obscurants would not reach levels that would have significant adverse impacts on water resources.

Amphibious Assaults

Under Alternative 2, potential impacts from amphibious assaults would be the same as that of the No Action Alternative and Alternative 1.

Wetlands

Multiple wetlands occur across SRI (Figure 3-3). The 2005 PEA identified troop and vehicle movements on the island as the primary activities that could impact wetlands. These types of activities and the associated potential impacts would be the same as those evaluated under the previous alternatives. Currently, Los Banos Training, Advanced Skills Training, and HAVE ACE activities, each occur 12 times per year for a total of 36 exercises. Under Alternative 2, these exercises would increase to 108 exercises per year. For most operations, vehicles would remain on established roads and would therefore not impact wetlands. However, in certain situations, vehicles and troops would need to move in areas without roads, creating the potential for wetland impacts. In these cases, routes for vehicle movements would be selected so that wetlands are avoided. Occasional movement of small numbers of troops near or through wetlands is not expected to result in significant impacts. Testing and training sites are typically selected based on avoidance of important environmental resources such as wetlands, and it would be possible in many cases to choose routes to minimize disturbance to wetlands. Federal and state permits would be required for potential impacts to wetlands, specifically an FDEP Wetland Resource Management Permit and an Army Corps Dredge and Fill Permit. A Finding of No Practicable Alternative would also be required in accordance with EO 11990.

The LCAC maneuver corridor is located in an area primarily devoid of wetlands. However, even if an LCAC were to pass over a wetland, no impacts would be anticipated due to the “hovercraft” nature of the vehicle. It should be noted that recent hurricanes could have altered the topography of the LCAC crossing site. If LCAC missions are conducted in the future, assessments of the previously approved corridors could be necessary.

Island crossing by tracked vehicles at A-13B during ARG/MEU exercises, which could potentially impact wetlands, was analyzed in the 2005 PEA. However, vehicle use in wetlands is not authorized or considered part of the proposed actions of this EA. If ARG/MEU or other training exercises requiring vehicles to operate in wetlands are conducted again on SRI, separate NEPA analysis would be required, and management requirements would be implemented during all activities.

Floodplains

Executive Order 11988 requires examination of actions involving construction (i.e., buildings, roads) within a floodplain regarding 1) potential impacts to drainage patterns in the floodplain, and 2) the potential for people or structures to be impacted by flooding, in order to minimize or prevent loss of life and property. Almost all of SRI lies within the 100-year floodplain (Figure 3-3). However, none of the activities associated with Alternative 2 involve construction, and thus there are no anticipated impacts to floodplains.

4.4 BIOLOGICAL RESOURCES

This section discusses potential impacts to biological resources from activities conducted at SRI on Eglin AFB property. Resources include terrestrial and marine species and habitats. Potential impacts to biological resources were addressed in the 2005 SRI Mission Utilization Plan PEA (U.S. Air Force, 2005). Activities analyzed in the 2005 document represent the baseline activities of the No Action Alternative in this REA. Potential impacts were analyzed according to general effector categories, which were identified as noise, direct physical impact, and habitat alteration. Species and habitats would be affected by a number of missions. However, specific mission-related management requirements and mitigations outlined in previous NEPA documentation and ESA and MMPA consultations would decrease the severity of effects so that significant impacts to biological resources would not occur.

4.4.1 No Action Alternative

Noise

Primary mission activities that would produce noise within the SRI ROI include aircraft and LCAC operations, gunnery and missile missions, amphibious craft operation, and surf zone missions. Although the effects of noise on wildlife are unclear, noise above 140 dBP may cause hearing damage in humans and could possibly affect wildlife. For example, the Santa Rosa beach mouse could potentially avoid habitat when noise levels exceed 140 dBP. Although safety procedures prevent the exposure of people to such levels, wildlife within the ROI would be exposed. Flight responses have been noted in sea birds exposed to aircraft noise greater than 85 dBA. Startle effects increase when the noise occurs simultaneously with a visual presence, such as a low flying aircraft. During sea turtle season (01 May to 31 October), sensitive turtle species occurring on SRI (Atlantic green sea turtle, Atlantic loggerhead turtle, Atlantic leatherback turtle, and Kemp's ridley sea turtle) could also be annoyed by elevated sound pressure levels. Management requirements, which are provided in Section 2.5, would help to minimize wildlife exposure to potentially harmful noise levels. Discussion of noise effectors is provided in the subsections below.

Aircraft Noise

Potential impacts to sensitive species from helicopter landings and low-level helicopter operations on SRI were assessed in the formal USFWS ESA Section 7 consultations for the ARG/MEU and for U.S. Army Ranger Los Banos training. Brief helicopter landings and low-altitude helicopter operations (less than 5 minutes for each activity) occur about once a

month during ranger training. The probability of a nesting female attempting to enter the beach within a half-mile radius of these activities is considered low, even during peak nesting periods. The peak nesting rate for loggerheads was reported in the 2005 PEA as 0.012 nests per night per 0.5 miles and the peak rate for green turtles is 0.007 nests per night per 0.5 miles, for a combined potential peak of 0.019 nests per night per 0.5 miles. If noise from helicopter operations was audible and sufficiently intense for an entire night during peak nesting season, the number of nesting deterrences would be estimated by multiplying the peak nesting rate by the number of exercises occurring. For example, if 100 missions were flown throughout the nesting season, all at night and over the peak nesting period, less than two deterrence episodes are likely to occur.

Helicopters may provide air support and surveillance for any training activity conducted on SRI. Low-level flights over piping plover critical habitat or shorebird nesting areas may result in a flush/startle response. During shorebird nesting season, this may increase the vulnerability of eggs and chicks to predation. However, due to the short duration of such overflight events, it is likely that the shorebird would return to the area soon after the incident. Nevertheless, it would be preferable to avoid plover critical habitat during wintering season (15 July to 15 May) and known shorebird nesting and feeding areas during nesting season (15 March to 31 August).

OA-HITL tower operations may result in startle responses to shorebirds in the immediate vicinity of the tower and may interfere with sea turtle nesting activity if operations are conducted at night. Similar to helicopter operation, the duration of these events would be short-term, and shorebirds would likely return to nesting sites rather quickly. Night operations during peak sea turtle nesting (May through August) may result in the deterrence; reduced night operations during nesting season are recommended.

LCAC Noise

Noise from LCAC use on land and water could impact sea turtles, resulting in harassment and adverse effects to nesting abilities. Effects from LCAC operations would primarily be limited to turtles at the surface, including hatchlings. Informal ESA Section 7 consultation with the NMFS for ARG/MEU training estimated that approximately 1.6 sea turtles, including hatchlings, would be present per square mile, with only about 0.5 turtles present at the surface.

LCAC use on land in the 7-mile training corridor was assessed in the USFWS ESA Section 7 Consultation for ARG/MEU training, and impacts and avoidance and minimization measures in that consultation would be similar for LCAC use anywhere on SRI given similar conditions. In summary, during night operations the noise generated by the craft's fans and engines, as well as general disturbance, is likely to deter nesting females from coming ashore in or near the landing corridor. Noise and vibrations produced by the craft may also disturb emerging hatchlings in or near landing corridors. For these reasons, nighttime LCAC activities would be minimized during sea turtle season.

Piping plover critical habitat is located approximately one-half mile from two of the LCAC crossover corridors associated with the No Action Alternative (Figure 3-4). Due to the complexity of plover habitat usage patterns, the presence of piping plovers in the crossover area is possible. It is likely that noise from LCAC operations would only flush birds from the landing and crossing area, possibly causing stress and extra caloric expenditure. If LCAC operations

became sustained at designated crossing corridors, the disturbance could keep piping plovers from foraging in the landing area during the course of the operation. During this time, displaced plovers may simply move to undisturbed foraging areas. The number of amphibious assault operations is unknown, and the likelihood of sustained operations in the future is also unknown. Amphibious missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future amphibious missions will involve moderate use of the island, and are expected to result in little to no impacts from noise.

A least tern colony has been documented within the LCAC crossing corridor at A-13B, and colonies occur within approximately one-half to one-fourth mile of other crossover sites as well. Nesting areas may change over time, and additional least tern colonies could therefore occur within crossover areas. Black skimmers also have the potential to nest on SRI in similar habitats. In addition, snowy plovers are solitary nesters and could nest anywhere along the rack line or other suitable habitat, which may include the LCAC crossover locations. Thus, nesting colonies or individual nests of these three species have the potential to occur within the crossover corridors, and any activity that occurs on SRI within the breeding seasons of these birds has the potential to impact reproductive success. Therefore, surveys would be required before LCAC use during nesting season. Located nests would be marked and avoided. Wading birds that are designated as species of special concern by the FWC could be temporarily displaced from foraging areas along crossover corridors or along shorelines of saltwater and freshwater water bodies.

Because the primary foraging and sheltering habitat of the state-listed Santa Rosa beach mouse is within the primary, secondary, and tertiary sand dunes of SRI, beach mice should not be significantly impacted by noise from LCAC crossings. In 2004, Eglin AFB Natural Resources Section began conducting monthly beach mouse track count surveys in the vicinity of the LCAC crossover area. In addition to these monthly surveys, Eglin also began conducting tracking tube surveys every other month in 2010 in accordance with Florida FWC protocols. Data from these surveys provide presence/absence information and are expected to indicate any substantial change in beach mouse populations on SRI.

Regarding potential effects to marine species offshore of SRI during Amphibious Ready Group/Marine Expeditionary Unit readiness training (U.S. Air Force, 2003c), impacts to marine mammals from the use of LCACs in the Gulf were not considered an issue of concern by the NMFS.

Surface-To-Air Missile Noise

The 2005 PEA identifies that wildlife within 0.2-mile of a PATRIOT missile launch would be exposed to a short duration (11 seconds) of a maximum noise level greater than 115 dBC. Noise levels decrease to less than 95 dBC 2 miles from the launch site. This contour encompasses nearly 12 square miles of water and land. As long as there are no nighttime test events during sea turtle season (01 May to 31 October), no adverse impacts to turtles are anticipated as a result of this sound pressure level. Nesting shorebirds could potentially be affected, but given the short duration of the launch noise, most birds would likely return to their nests within a few minutes.

Small Boat Obscurant Testing

Small boat obscurant testing generally occurs during beach landings or reconnaissance missions. No harmful noise levels would be produced from small boats during these activities. However, noise could be a source of deterrence to nesting sea turtles if activities are conducted at night during sea turtle season. For this reason, use of small boats at night between May and October should be avoided.

Surf Zone Testing

Noise associated with surf zone testing would consist of activities required to place mine shapes and structures such as those used in ALRT testing, and may include human activity and heavy machinery. Surf zone detonations have occurred on SRI but are not proposed. Thus, there would be no in-air or underwater noise concerns regarding this alternative.

Gunnery Noise

It is expected that most or all LCAC gunnery training would involve inert munitions (live rounds would only be approved on a case-by-case basis through the AFF 813 process). However, the 2005 PEA provides analysis for live 30-mm rounds. During possible live training, it is likely that species in the immediate vicinity of the LCAC would move outside of the maneuver area due to the general disturbance. Noise from 30-mm gunfire is therefore not anticipated to directly affect animal species. The noise associated with the firing of the 30-mm gun may result in a startle effect to small mammals and birds near the area and could temporarily interfere with foraging activities or nesting. However, foraging animals may simply move on to other areas, while nesting birds would likely return shortly after the exercise was completed. Firing of 30-mm munitions from LCACs should be avoided during evening hours from May to October in order to avoid deterrence of sea turtle nesting activities.

Species within the immediate vicinity of small arms firing areas would likely exhibit a startle response to the noise. However, foraging species would typically move to other areas, while nesting species would return after the disturbance. These activities would also likely startle predators (e.g., feral cats, coyotes) from the area, thus reducing the chances of nest predation should nesting birds be flushed.

Activities conducted at night near the beach during sea turtle season may result in nest deterrence due to noise disturbance. However, nightly nesting emergence rates are low, even during peak nesting season. There is a low probability that nesting sea turtles would be deterred by munitions firing; however, firing at night on the beaches should be avoided during the peak nesting season for each species (June and July), and night firing should be minimized during hatching season whenever possible. If a sea turtle were observed on the beach during live fire activities, all firing would cease, allowing the turtle to continue its activities. If hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination.

Amphibious Assault Noise

Amphibious assaults may involve the use of LCACs, LCUs, AAVs, and Zodiac boats within 6 miles or less of the shoreline. The noise created by these vehicles would be expected to deter marine mammals from the immediate area during transit activities, but activities would last only a few hours at most on any given day. Noise impacts to marine mammals from amphibious assaults are anticipated to be minor and short-term.

Direct Physical Impacts

Direct impacts to wildlife could result from vehicular, aircraft, boat, and foot traffic, gunnery, and missiles. These types of mission activities produce fragments that could potentially cause physical injury to wildlife species. Additionally, vehicular and foot traffic could crush sensitive species, and boats and aircraft could collide with animals, causing injury or death.

Vehicle Collision/Foot Trampling

Wheeled vehicle and troop maneuvers take place across the island. Any night operations on the beachfront pose a threat of direct physical impact to sea turtle nests, adults, and hatchlings, and may obscure sea turtle tracks. Therefore nighttime beachfront activities would be minimized when possible during sea turtle season. Corridors would be surveyed for evidence of sea turtle nesting or hatching activity immediately prior to night activities. When driving along the shoreline, vehicles must remain at least 50 feet from the primary dune line, and troops would be instructed to remain within designated troop movement areas on the beach. Vehicle operators and troops would be instructed to avoid marked sea turtle nests by at least 50 feet.

If a sea turtle were observed on the beach during activities, personnel would remain quiet, allowing the turtle to continue its activities. Efforts would be made to not obscure the turtle crawl or the nest area. If hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination. All effort would be made not to obscure the turtle crawls or the nest from where they emerged. Between 01 May and 31 October, when activities would be conducted on the beach during the night, one participant would be designated as an observer to be responsible for identifying signs of nesting or hatchling sea turtles. The observer would be responsible for assuring that the training participants did not interfere with nesting sea turtles, impede hatchling sea turtles from emerging from the nest and crawling to the Gulf of Mexico, or obscure signs of sea turtle activity. Direct physical impacts to adults, hatchlings, and/or nests are possible from wheeled vehicles and troop movement; however, adherence to proper avoidance and minimization measures would greatly reduce the potential for adverse impacts to sea turtle populations.

During certain operations, vehicles/craft may be staged on the beachfront during the day and/or night. Although female sea turtles may be discouraged from nesting by the presence of vehicles/craft, only limited numbers would be on the beachfront at any one time, and therefore the affected area would be relatively small. To prevent direct impact to nests and/or the obscuring of sea turtle tracks within landing and staging areas, these areas would be surveyed immediately before night amphibious landings. To the extent practicable, vehicles and watercraft would be staged at water's edge. Whenever it is necessary to stage vehicles on the

beachfront, silt screens would be installed around the base of the vehicles. With these avoidance and minimization measures in place, the staging of vehicles on the beachfront at night during sea turtle season is not likely to directly impact sea turtles.

Potential management requirements for nest protection may also require nest relocation. Nests occurring within the action area requiring relocation may experience reduced egg viability and egg mortality. Whenever possible, nests should be left *in situ*. The nests that do require relocation would be moved in accordance with FWC Marine Turtle Conservation Guidelines and all nests would be monitored daily by permitted surveyors.

The perforate reindeer lichen is found landward of the primary dunes in the scrub and coastal grassland communities. Trampling from foot and vehicle traffic is a potential threat to the lichen. Locations of the perforate reindeer lichen have been fenced off and marked with signs reading “Keep Out – Endangered Species” so these areas can be easily avoided by troops and vehicles. With the marking and fencing of lichen locations, no direct impacts to the lichen are anticipated from vehicle or foot trampling.

Movement of wheeled vehicles, LCACs, and troops may occur in areas close to shorebird, wading bird, or piping plover habitat. Noise from vehicle and troop activities near foraging and breeding areas would likely temporarily flush the birds from the area, minimizing the chances of a direct physical impact.

Surf Zone Testing

Surf zone testing is not likely to adversely affect a protected species through direct physical impact. There would be no detonations, nor shrapnel produced from this type of activity. Surf zone detonations are not part of this alternative, and would require a separate analysis.

Boat Collisions

Small boats may potentially be used for obscurant testing throughout the surf zone. As described for surf zone testing above, the density of adult and hatchling sea turtles per square mile is less than two turtles. Some percentage of these two individuals may be directly affected by boat traffic, but the likelihood is considered remote. Turtles would likely leave the area due to noise produced by the boats. Visual surveys would further ensure clearance of the area. Marine mammals are extremely mobile and have a good sense of hearing, and could therefore avoid small boats. Boat use during obscurant operations would be substantially less than recreational boat use in the area. Boat traffic is not likely to directly impact Gulf sturgeon due to the fact that sturgeon spend most of their time feeding on the ocean floor. The likelihood of an encounter with a boat is considered unlikely.

Beachfront Activities

Beachfront activities associated with surf zone testing have the potential to impact sea turtles. Setup activities and exercises associated with mine countermeasures may require beachfront activities involving vehicles, personnel, equipment, and objects such as inert mines and obstacles. For example, Naval Explosive Ordnance Disposal School (NEODS) personnel would

use the beachfront to practice inert mine countermeasure procedures on mines they pulled out of the Gulf (live detonations associated with the NEODS occur outside of the seaward boundary of the ROI, and impacts are analyzed in other Air Force documentation). Such activities would require only a small portion of the beach (less than 100 feet of beachfront) and activities typically last only a few days. Vehicle access to the beach may be required, but during sea turtle season vehicle access would be limited to daytime hours. Personnel would be trained to spot sea turtle crawls, instructed to stay away from nests, and informed of other appropriate measures to minimize the potential for direct impacts to sea turtles.

Shrapnel/Direct Hit

Munitions training on SRI is generally conducted with inert rounds. However, the 2005 PEA provides analysis of potential live fire events. Live fire activities would involve low-range munitions. Small-caliber weapons between 5.56 mm and .50 caliber could be fired in a seaward direction only. If available, soldiers would use frangible munitions (5.56 mm, 7.62 mm, and .50 cal) with effective ranges of 25 to 150 meters or those of nonlead composition (i.e., tungsten) to reduce or eliminate potential environmental and safety concerns. The effective ranges for standard munitions (5.56 mm, 7.62 mm, and .50 cal) vary from 550 meters to 2,000 meters.

Nighttime use of munitions has the potential to impact sea turtles. The peak sea turtle nesting rates provided in the 2005 PEA are 0.012 nests per night per 0.5 miles for loggerheads, 0.007 nests per night per 0.5 miles for green sea turtles. Leatherback and Kemp's ridley nesting is small and considered negligible for this analysis.

Given the low rates of nesting emergencies, there is a low probability that nesting sea turtles would be directly impacted by munitions firing; however, firing at night on the beaches should be minimized when possible during sea turtle season. This probability would be further reduced if exercises were conducted outside of the peak nesting seasons for each species. For live fire activities at night during sea turtle season, an observer must be present to identify signs of sea turtle activity. If a sea turtle or hatchling was observed on the beach during live fire activities, all firing would cease, allowing the turtle to continue activities. With these requirements in place, small arms firing at night during sea turtle season on SRI is not anticipated to directly impact sea turtles. Activities during the day are expected to have no effect.

Live fire operations with munitions directed towards the Gulf also have the potential to impact marine mammals (primarily bottlenose dolphins) and sea turtles in the water. Precautionary measures should be taken to minimize the risk for direct impacts to these species, including pre-mission surveys to certify the test area clear of animals and post-mission surveys to search for any animals potentially injured or killed. These measures should minimize the risk of direct physical impacts from live fire to marine mammals and sea turtles in the water.

Potential for direct impacts to the Santa Rosa beach mouse from live fire is extremely low due to the fact that beach mice tend to spend much of their time in nests that they excavate in the dunes and that they are nocturnal. Munitions are not likely to directly impact the Santa Rosa beach mouse.

Munitions use on SRI could potentially directly affect piping plovers, wading birds, and/or shorebirds. The potential for a direct strike is extremely low, but could be reduced (for the piping plover) by minimizing missions during the winter foraging period. Establishing buffer zones around known piping plover critical habitat during the winter foraging period (e.g., 150 meters for frangible munitions, 2,000 meters for standard munitions) and directing fire towards the Gulf, which is away from the plover habitat, would further reduce potential strikes. Avoidance of nesting areas for shorebirds and wading birds during breeding season would minimize the possibility of direct impacts to these species.

Target areas should be determined clear of birds and other animals before firing. In the event that a bird is found in or near the firing areas, noise associated with the firing of munitions can be expected to flush the bird from the landing area. During this time, displaced birds may simply move on to undisturbed foraging areas nearby. Firing of small arms is not anticipated to directly impact the piping plover, wading bird, or shorebird populations on SRI.

Amphibious Assaults

Sea Turtles

Amphibious landings may involve the use of LCACs, LCUs, AAVs, and Zodiac boats at the land-water interface. Ground movement covers use of tracked vehicles, wheeled vehicles, and troop maneuvers on land. Direct physical contact between sea turtles and amphibious vessels could occur. The 2005 PEA provides analysis on the estimated number of turtles potentially struck during amphibious missions. Amphibious vehicle transit during the 2003 Amphibious Ready Group/Marine Expeditionary Unit training exercise, the largest amphibious exercise on SRI to date, potentially affected up to 16 sea turtles. The ARG/MEU involved landings of LCACs, AAVs, LCUs, and Zodiacs. This activity is considered a worst-case scenario for impacts due to amphibious landings. Since 2003, amphibious missions have consisted primarily of Zodiac boat landings. It is anticipated that any future amphibious missions will involve moderate use of the island, and are expected to result in little to no impacts.

Using the area of ocean surface affected by craft movements and the density of sea turtles, the expected maximum number of sea turtles within the vessel transit area would be approximately 16. Some percentage of these 16 individuals may be affected through direct contact with a boat or amphibious vessel, but the likelihood is considered small. Adult turtles would likely avoid collision with LCUs because these vessels move slowly. LCACs produce loud noise that might be detected some distance away. The greatest potential risk was considered in the 2005 PEA to be direct contact with hatchlings during sea turtle season. This potential would be reduced through avoidance of *Sargassum* mats. LCACs maneuvering on land could pass over adult or hatchling sea turtles. While the hull structure would not likely physically strike turtles due to the hovercraft nature of the vessel (riding on a cushion of air, except for an apron that contacts the surface), the downdraft of air underneath the vessel could kill, injure, or disturb sea turtles. Adherence to avoidance and minimization measures would reduce the potential to impacts to sea turtle populations. Activity occurring outside of sea turtle season is not anticipated to directly impact sea turtles.

AAVs may also potentially be used in maneuver areas. During sea turtle season, AAV use in maneuver areas would be restricted to daytime hours. Prior to sunset, ruts would need to be removed to avoid impacts to sea turtles. Coordination with the Natural Resources Section would be necessary to ensure that no sea turtle nests were located in the maneuver area prior to AAV operations. Outside of sea turtle season, AAVs would be free to maneuver during the day or night.

Heavy troop maneuvers also have the potential to directly impact sea turtles, but it is unlikely. Of more concern is the potential for these maneuvers to obscure evidence of sea turtle crawls and nests. To prevent this, all corridors would be surveyed for evidence of sea turtle activity immediately prior to night activities. Troops would be instructed to remain within designated troop movement areas on the beach.

Direct physical impacts to adults, hatchlings, and/or nests are possible from tracked vehicles, wheeled vehicles, and troop movement. However, adherence to proper avoidance and minimization measures can greatly reduce the potential for direct impacts to sea turtle populations.

Marine Mammals

Bottlenose and Atlantic spotted dolphins occur in nearshore waters of the Gulf. Manatees also occur, although the frequency of occurrence is unknown. The largest vehicles that would be moving in the near offshore waters are LCACs. Analysis provided in the 2005 PEA estimated that approximately seven dolphins would occur in the operations area. However, dolphins would easily avoid collision because the LCUs and AAVs move slowly and the LCACs produce noise that would be detected some distance away and would be avoided as any other boat in the Gulf. Amphibious craft activities offshore of SRI are not anticipated to directly impact marine mammal individuals or populations.

Birds

Movement of tracked and wheeled vehicles, LCACs, and troops may occur in areas close to piping plover foraging habitat, shorebird habitat, or wading bird habitat. Short-term activities near these foraging and breeding areas would likely temporarily flush the birds from the area, minimizing the chances of a direct physical impact. However, impacts to nests, chicks, and eggs could result from trampling or crushing due to vehicle and troop maneuvers through nesting areas. As a result, shorebird nesting areas should be avoided during nesting season (01 March to 31 August).

Perforate Reindeer Lichen

Perforate reindeer lichen is found landward of the primary dunes in the scrub and coastal grassland communities. Trampling from foot and vehicle traffic is a potential threat to the lichen, so locations of the perforate reindeer lichen have been fenced off and marked with signs reading "Keep Out – Endangered Species" so these areas can easily be avoided by troops and vehicles. With the marking and fencing of lichen locations, no direct impacts to the lichen are anticipated from amphibious or ground maneuvers.

Santa Rosa Beach Mouse

No impacts are anticipated from LCAC crossovers due to the “hovercraft” nature of the vehicle. Tracked and wheeled vehicle traffic has the potential to crush the beach mouse, but the risk of this is relatively low since this type of traffic is already limited in dune areas, which is the primary habitat for the beach mouse.

Gulf Sturgeon

While in the Gulf of Mexico, Gulf sturgeon spend the majority of their time at or near the bottom feeding on invertebrates in the substrate. Therefore, the effects of the use of LCACs and Zodiacs, which have a shallow draft, on Gulf sturgeon are expected to be insignificant. The AAVs and LCUs, which are tracked amphibious vehicles that may have a draft of up to seven feet, have the potential to directly impact Gulf sturgeon, but it is unlikely given that these vehicles are slow and allow the sturgeon ample time to avoid them. Direct impacts from AAVs and LCUs on Gulf sturgeon are not anticipated.

Habitat Alteration

Habitat alterations characterize the physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to a species. A habitat refers to ecological and geomorphological components, such as vegetation, soil, topography, and water that support organisms. Habitats may be altered by a variety of factors, including changes in vegetation, structure, food sources, breeding and nesting areas, etc. Habitat alteration may lead to decreased barrier island stability, decreased survival of threatened, endangered, or special status species, or degradation of areas critical to overall species diversity.

Sensitive Habitats

Sensitive habitats were identified in the 2005 PEA as Coastal Protection Areas and dune communities. Coastal Protection Areas were designated on SRI based on a 1992 FNAI report on coastal upland communities. These were areas of extremely good scrub habitat and areas where the perforate lichen was found; however, the current condition of these sites is not known since numerous hurricanes have impacted the island since the sites were designated. Until a survey is made to assess current conditions, troop movement in these areas should be limited to areas seaward of the dunes and vehicle movement should be restricted to a relatively narrow corridor close to the shoreline and on designated roads. Some LCAC corridors or maneuver areas identified in the 2005 PEA would cross previously-identified Coastal Protection Areas, including east of A-17A and east of A-2. Given that these LCAC sites were chosen for their relative flatness and lack of substantial vegetation, it is likely that these areas were negatively impacted by recent hurricanes and would no longer be considered as Coastal Protection Areas. Therefore, impacts to these sensitive areas are expected to be minimal.

The beach dune community is one of the most predominate vegetative communities present on SRI. The importance and fragility of this ecosystem dictate that operations be restricted to only those activities that have minimal impact to ground cover and dune structure. Repeated disturbance to dunes can result in destabilization. It is not likely that LCAC operation would

result in a significant change in dune height. Measurement of LCAC sand displacement showed that two LCAC passes resulted in only a 0.75-inch decrease in dune elevation immediately after the crossover. Moreover, within the LCAC crossover corridor, LCACs may not use the same exact path of travel through the corridor, and it is likely that the sand displacement caused by one LCAC would be counteracted by the displacement of another.

Vehicle traffic and substantial troop maneuvers may also occur in certain areas. Due to the fragility of the dune ecosystem, all vehicle and troop maneuvers would avoid dunes taller than five feet and large sea oat clumps to minimize impacts. Vehicles would remain on existing roads whenever possible. Vehicular movement corridors would be limited to the minimum size necessary for the mission, and corridors would be marked so as to be easily distinguished by vehicle operators.

Wildfires

There is no prescribed burning program for SRI, but small wildfires have occurred as a result of pyrotechnics. The scrub community on SRI is fire maintained, with catastrophic wildfires expected about once every 20 to 80 years, but natural fires in other island communities are rare. Efforts should be taken to minimize the likelihood that man-induced wildfires are started in any of the ecological communities because fire is naturally an infrequent occurrence on the island. Alteration of the natural fire regime would lead to changes in the composition and structure of vegetative communities. If wildfires are started near buildings or other structures, they should be contained as quickly as possible using minimally damaging control methods. However, given the patchy fuels and prevalent north/south wind on the island, it is likely that the fires would not spread very far or cover much area.

Invasive Non-Native Species

The introduction of invasive non-native species to the island could threaten the health of native species, such as the federally listed perforate reindeer lichen and sensitive marsh communities. Invasive plant species often thrive in areas of disturbance where they can out-compete native species and take over an area. Secondary impacts can include degradation of food sources and shelter for native animals, such as the piping plover. To reduce opportunities for invasive plants to invade, disturbances should be minimized and localized when possible. Natural Resources Section staff should be notified when missions will occur in an area known to contain invasive species so that the area can be prioritized for treatment to kill the invasive plants before the mission takes place.

Management recommendations that can reduce the spread of invasive plants associated with mission activities include:

- Restricting vehicle/equipment access in untreated areas with known invasive plant problems.
- Washing vehicles/equipment before transport onto the island.
- Keeping vehicles on established roads when possible.

- Designating access corridors from roads to beach and periodically monitoring these corridors for invasive species.
- Coordinating with Natural Resources Section to select native species for any new plantings on the island.
- Screening sources of construction material and fill dirt to ensure that no invasive plants are present.
- Using only certified weed-free vegetative material (e.g., hay bales, pine straw) if brought in from off the island.

If the management recommendations listed above are followed, the likelihood that island missions would transport invasive species is low.

Artificial Lighting

Depending on the time of year, certain night mission-related lighting could affect light-based cues used by hatching sea turtles. Newly hatched sea turtles orient towards light sources when crawling to the sea. Consequently, if there are manmade light sources in the dunes, they may mistakenly crawl landward instead of towards the sea, resulting in mortalities from predators and desiccation. Man-made lighting can also disturb nesting adult sea turtles. Any helicopter insertions would be brief and lighting would be kept to a minimum; thus no impacts from helicopter lights are anticipated.

For other activities that may impact sea turtles, such as vehicle and troop maneuvers or equipment setup on the beachfront, lighting would be minimized through reduction, shielding, lowering, and appropriate placement of lights to prevent the glowing portion of any luminaries (including lamp, globe, or reflector) from being directly visible from anywhere on the beach. Personnel conducting work, including driving and/or operating equipment on or adjacent to the beach, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights and lighting on equipment at night.

Missions that routinely require nighttime conditions should avoid sea turtle locations and seasons (01 May to 31 October) if possible. If not possible, management actions may include conversion to low-pressure sodium vapor lighting, use of light shields to protect critical dune areas, and turning off unnecessary nonmission or safety lights. Management measures, including fencing off active nests and redirecting any disoriented hatchlings, should be employed. Mission personnel would need to work with the Natural Resources Section to implement these management measures.

Sensitive Animal Species Habitat

Habitat impacts may affect the health of a number of sensitive animal species on SRI, which were identified in the 2005 PEA as the Santa Rosa beach mouse, sea turtles, piping plover, wading birds, and shorebirds. Habitat for these species could be impacted by mission activities, including the disturbance of nesting and feeding areas by ground troops and vehicle/equipment traffic. Avoidance of known nesting and feeding areas is the best method to minimize impacts to

sensitive animal species. Coordination with Natural Resources Section staff would be required to determine the habitats of sensitive species, which in some cases would be marked.

Sea Turtles

LCAC movement is not expected to produce ruts in the sand because they travel approximately four feet above the ground. However, sand blown from beneath the air cushion may obscure evidence of sea turtle activity, interfering with surveyors' ability to locate, mark, and protect nest sites. Vehicle and heavy troop movement may also obscure evidence of sea turtle crawls and nests. To prevent this, LCAC corridors would be surveyed for evidence of sea turtle activity immediately prior to night activities. Vehicles and troops would be instructed to remain within the designated movement corridors and avoid dunes over five feet high, thereby reducing impacts to nesting habitat.

Vehicles/craft may land or be offloaded and staged on the beachfront during certain operations. Although female sea turtles may be discouraged from nesting where vehicles/craft are left on the beachfront at night, only limited numbers would occur at any one time, and therefore the affected area would be relatively small. To the extent practicable, vehicles and watercraft would be staged at water's edge. Whenever it is necessary to stage vehicles on the beachfront, silt screens would be installed around the base of the vehicles.

Beachfront activities associated with surf zone testing have the potential to impact sea turtle habitat. Setup activities and exercises associated with mine countermeasures may require beachfront activities involving vehicles, personnel, equipment, and objects. Such activities would require only a small portion of the beach (typically less than 100 feet of beachfront). Vehicle access to the beach may be required, but personnel would be instructed to avoid dunes greater than five feet in height and, during sea turtle season, all ruts would be removed prior to sunset.

During amphibious assault training, tracked vehicles can create ruts as they come ashore. Ruts at the waterline would be removed by wave action and tides and are not expected to pose a risk to hatchlings. Ruts above the waterline may impede hatchling movement or obscure evidence of sea turtle activity. However, in accordance with required management practices, ruts would be removed as soon as is practicable, and before the next evening. Furthermore, to preserve nesting habitat, vehicle movement corridors would be clearly marked. Overall, use of tracked and wheeled vehicles on the beach during sea turtle season is likely to adversely impact sea turtle habitat. However, adherence to proper avoidance and minimization measures can greatly reduce the potential for adverse impacts to sea turtle habitat.

Birds

Piping plover critical habitat is situated on the north shore of SRI near A-18. Troop and vehicle movement may occur near possible piping plover foraging areas (sand/mud flats) on the north shore of the island and have the potential to impact critical habitat. Large troop maneuvers and vehicle movements would be limited to areas outside of piping plover critical habitat. Ground movement activities on SRI would have no effect on piping plover critical habitat. One LCAC crossing area identified in the 2005 PEA lies approximately 0.75 mile from plover critical

habitat, and one maneuver area would be located just south of the plover habitat, but no impacts are anticipated because LCACs would remain out of plover critical habitat. Activities associated with amphibious landings would not occur in or near piping plover critical habitat.

Wading birds forage mainly in wetland areas or along shorelines of saltwater and freshwater bodies. A breeding area for several wading bird species is present along the west shore of East Pass on SRI. Vehicle traffic and substantial troop movement through these areas has the potential to impact wading bird habitat. Colonies or individual nests of several shorebird species are usually found along the rack line or other suitable habitat along the beach, and have the potential to occur within mission areas. As a result, any activity that occurs on SRI within the breeding seasons of these birds has the potential to impact reproductive success. Avoidance measures would minimize the potential for these species or their habitats to be impacted.

Santa Rosa Beach Mouse

The primary foraging and sheltering habitat of the state-listed Santa Rosa beach mouse is within the primary, secondary, and tertiary sand dunes of SRI. Hovercraft and wheeled vehicles may operate on various portions of SRI, and troop maneuvers may occur almost anywhere on the island. Vehicles and troops are expected to avoid dunes greater than five feet high. This measure would reduce potential impacts to beach mice and their burrows. Avoiding dunes would also reduce impacts to the dune vegetation, which serves as a food source for this species. In 2004, Eglin AFB Natural Resources Section began conducting monthly beach mouse track count surveys in the vicinity of the LCAC crossover area. In addition to these monthly surveys, Eglin also began conducting tracking tube surveys every other month in 2010 in accordance with Florida FWC protocols. Data from these surveys provide presence/absence information and are expected to indicate any substantial change in beach mouse populations on SRI. Ground maneuvers are not anticipated to adversely impact Santa Rosa beach mouse habitat.

Essential Fish Habitat

The habitat on the Gulf side of SRI is a sandy/silty substrate, which does not support seagrass beds. The nearest major seagrass bed in the Gulf of Mexico (versus Santa Rosa Sound) is located to the southeast of Cape San Blas, outside of the study area; therefore, there are no potential impacts to seagrasses that serve as EFH. *Sargassum* is a free-floating algae that drifts as mats in oceanic eddies. Management requirements from previous operations require missions to avoid *Sargassum* mats. Missions offshore of SRI would also avoid *Sargassum* mats; thus there would be no impacts to *Sargassum* that functions as EFH.

Artificial reefs occur offshore of A-4. These reefs are over a mile out and are not located near any of the proposed surf zone test areas or landing areas. A shipwreck east of A-15A is located between two LCAC corridors approved in the 2005 PEA, but due to the “hovercraft” nature of the LCAC, there would be no impacts below the surface of the water. Contact between AAVs and LCUs, which would land at A-13B during amphibious assault training, could affect the shipwreck’s utility as fish habitat as well as cause damage to the surface craft. If this structure is avoided, the proposed activities conducted at SRI are not likely to adversely impact EFH.

Gulf Sturgeon

Impacts to Gulf sturgeon critical habitat from surf zone activities such as ALRT are not anticipated.

During amphibious assault training, LCUs and AAVs could affect Gulf sturgeon habitat. LCUs have a draft of 7 feet and would likely cause ruts in bottom sediments where they land offshore of SRI. Sandy, muddy substrate may also be affected by tracked AAVs landing at SRI. However, due to the small impact area, impacts to the Gulf sturgeon through habitat alteration from AAVs and LCUs are not anticipated. Due to the shallow draft of the Zodiacs and the “hovercraft” nature of the LCACs, these vehicles are not anticipated to impact Gulf sturgeon critical habitat.

4.4.2 Alternative 1

This section discusses potential impacts to biological resources from activities associated with Alternative 1. Impact analysis follows the format of the 2005 SRI Mission Utilization Plan PEA (U.S. Air Force, 2005) and the No Action Alternative of this document, which provides analysis according to general effector categories. These categories include as noise, direct physical impact, and habitat alteration.

Noise

The mission categories considered most likely associated with potential noise impacts are the same as those described in the No Action Alternative, and include aircraft and LCAC operations, gunnery and missile missions, amphibious craft operation, and surf zone missions.

Aircraft Noise

Brief helicopter landings and low-altitude helicopter operations (less than 5 minutes for each activity) occur about once a month during U.S. Army Ranger Los Banos training. Helicopter operations can potentially occur with other missions such as ARG/MEU training, although the number of missions is not quantified. Helicopter noise could potentially deter nesting sea turtles from coming ashore or disturb shorebirds. Shorebird flush/startle responses could increase the vulnerability of eggs and chicks during nesting season. The probability of a nesting female attempting to enter the beach near areas of helicopter operations is considered low, even during peak nesting periods. In addition, due to the short duration of overflight events, it is likely that shorebirds would return to the area soon after the incident. Nevertheless, it would be preferable to avoid plover critical habitat during wintering season (15 July to 15 May) and known shorebird nesting and feeding areas during nesting season (01 March to 31 August).

OA-HITL tower operations may result in startle responses to shorebirds in the immediate vicinity of the tower and may interfere with sea turtle nesting activity if operations are conducted at night. Although the number of OA-HITL tower operations is not quantified, effects similar to helicopter operations would be expected. The duration of these events would be short-term, and shorebirds would likely return to nesting sites rather quickly. Night operations during peak sea

turtle nesting (May through August) may result in the deterrence; reduced night operations during nesting season are recommended.

LCAC Noise

Noise from LCAC use on land and water could impact sea turtles and shorebirds. The number of LCAC operations under Alternative 1 is unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts from noise. Effects from LCAC operations would primarily be limited to sea turtles at the surface, including hatchlings. It is estimated that approximately 1.6 sea turtles, including hatchlings, would be present per square mile of LCAC operations, with only about 0.5 turtles present at the surface. Previous Section 7 consultation under the ESA for ARG/MEU training specified that nighttime LCAC activities should be minimized during sea turtle season.

LCAC crossovers would not occur in piping plover critical habitat. However, due to the complexity of plover habitat usage patterns, this species could occur in the crossover area. It is likely that noise from LCAC operations would result in only temporary flushing from operations area. If LCAC operations became sustained at designated crossing corridors, the disturbance could keep piping plovers from foraging in the landing area during the course of the operation. During this time, displaced plovers may simply move to undisturbed foraging areas. The likelihood of sustained operations in the future is unknown.

A least tern colony has been documented within the LCAC crossing corridor. Nesting areas may change over time, and additional least tern colonies could therefore occur within crossover areas. Black skimmers also have the potential to nest on SRI in similar habitats. In addition, snowy plovers could nest anywhere along the rack line or other suitable habitat, which may include the LCAC crossover location. Thus, nesting colonies or individual nests of these three species have the potential to occur within the crossover corridor, and any activity that occurs within the breeding seasons has the potential to impact reproductive success. Therefore, surveys would be required before LCAC use during nesting season. Located nests would be marked and avoided. Wading birds that are designated as species of special concern by the FWC could be temporarily displaced from foraging areas along crossover corridors or along shorelines of saltwater and freshwater water bodies.

The Santa Rosa beach mouse is not expected to be impacted by LCAC noise because primary foraging and sheltering habitat occurs within the primary, secondary, and tertiary sand dunes. Eglin AFB Natural Resources Section conducts quarterly track count surveys in the vicinity of the LCAC crossover area. Data from these surveys are expected to indicate any substantial change in beach mouse populations on SRI.

Impacts to marine mammals from the use of LCACs in the Gulf were not considered an issue of concern by the NMFS.

Surface-To-Air Missile Noise

Up to three PATRIOT missile launches could occur annually under Alternative 1. It is expected that that wildlife within 0.2 mile of a PATRIOT missile launch would be exposed to a short duration (11 seconds) of a maximum noise level greater than 115 dBC. Noise levels decrease to less than 95 dBC 2 miles from the launch site. This contour encompasses nearly 12 square miles of water and land. As long as there are no nighttime test events during sea turtle season (01 May to 31 October), no adverse impacts to turtles are anticipated. Nesting shorebirds could potentially be affected, but given the short duration of the launch noise, most birds would likely soon return to their nests.

Small Boat Obscurant Testing

The number of small boat obscurant testing missions associated with Alternative 1 is unknown. No harmful noise levels would be produced from small boats during these activities. However, noise could be a source of deterrence to nesting sea turtles if activities are conducted at night during sea turtle season. For this reason, according to management requirements, use of small boats at night between May and October should be avoided.

Surf Zone Testing

Noise associated with surf zone testing would consist of activities required to place mine shapes and structures such as those used in ALRT testing, such as human activity and heavy machinery. Surf zone detonations are not proposed. Thus, there would be no in-air or underwater noise concerns to biological resources from this alternative.

Gunnery Noise

It is expected that most or all LCAC gunnery training would involve inert munitions (live rounds would only be approved on a case-by-case basis through the AFF 813 process). However, the 2005 PEA provides analysis for live 30-mm rounds. The number of LCAC operations under Alternative 1 is unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts from gunnery noise. During live training, it is likely that species in the immediate vicinity of the LCAC would move outside of the maneuver area due to the general disturbance. Noise from 30-mm gunfire is therefore not anticipated to directly affect animal species. The noise associated with the firing of the 30 mm may result in a startle effect to small mammals and birds near the area and could temporarily interfere with foraging activities or nesting. However, foraging animals may simply move on to other areas, while nesting birds would likely return shortly after the exercise was completed. Firing of 30 mm from LCACs should be avoided during evening hours from May to October in order to avoid deterrence of sea turtle nesting activities.

Up to approximately 785,000 small arms rounds could be expended annually under this alternative, although the number of missions associated with level is not quantified. Species within the immediate vicinity of small arms firing areas would likely exhibit a startle response to

the noise. However, foraging species would typically move to other areas, while nesting species would return after the disturbance.

Activities conducted at night near the beach during sea turtle season may result in nest deterrence due to noise disturbance. However, nightly nesting emergence rates are low, even during peak nesting season. There is a low probability that nesting sea turtles would be deterred by munitions firing; however, firing at night on the beaches should be avoided during the peak nesting season for each species (June and July), and night firing should be minimized during hatching season whenever possible.

Amphibious Assault Noise

Amphibious assaults may involve the use of LCACs, LCUs, AAVs, and Zodiac boats within 6 miles or less of the shoreline. The noise created by these vehicles would be expected to deter marine mammals from the immediate area during transit activities, but activities would last only a few hours at most on any given day. Noise impacts to marine mammals from amphibious assaults are anticipated to be minor and short-term.

Direct Physical Impacts

Similar to the No Action Alternative, direct impacts to wildlife could result from vehicular, aircraft, boat, and foot traffic, gunnery, and missiles. These types of mission activities could potentially cause physical injury to wildlife species. Additionally, vehicular and foot traffic could crush sensitive species, and boats and aircraft could collide with animals.

Vehicle Collision/Foot Trampling

The number of missions involving vehicle and troop movement is unknown, but these missions may take place in many areas of the island. Los Banos Training, Advanced Skills Training, and HAVE ACE activities each occur 12 times per year for a total of 36 exercises. Under Alternative 1, these exercises may increase but the extent is not known. Night operations on the beachfront pose a threat to sea turtle nests, adults, and hatchlings, and may obscure sea turtle tracks. Therefore nighttime beachfront activities would be minimized when possible during sea turtle season, and management requirements provided in Section 2.5 would be employed.

During certain operations, vehicles/craft may be staged on the beachfront. Although female sea turtles may be discouraged from nesting, only limited numbers of vehicles/craft would be on the beachfront at any one time, and therefore the affected area would be relatively small. Management requirements provided in Section 2.5 would substantially reduce the potential for direct impact to sea turtles. With these avoidance and minimization measures in place, the staging of vehicles on the beachfront at night during sea turtle season is not likely to directly impact sea turtles.

Perforate reindeer lichen is found landward of the primary dunes in the scrub and coastal grassland communities. Trampling from foot and vehicle traffic is a potential threat to the lichen. However, locations of the lichen have been fenced off and marked with signs so that

these areas can be easily avoided by troops and vehicles. With the marking and fencing of lichen locations, no direct impacts are anticipated from vehicle or foot trampling.

Movement of wheeled vehicles, LCACs, and troops may occur in areas close to shorebird, wading bird, or piping plover habitat. Noise from vehicle and troop activities near foraging and breeding areas would likely temporarily flush the birds from the area, minimizing the chances of a direct physical impact.

Surf Zone Testing

Inert surf zone testing, such as ALRT, is not likely to directly interact with or physically impact wildlife or protected species. There would be no detonations, nor shrapnel produced from this type of activity. Surf zone detonations are not part of this alternative, and would require a separate analysis.

Boat Collisions

Small boats may potentially be used for obscurant testing throughout the surf zone, although the number of missions per year is not specified. As described for surf zone testing above, the density of adult and hatchling sea turtles per square mile is less than two turtles. Some percentage of these two individuals may be directly affected by boat traffic, but the likelihood is considered remote. Turtles may leave the area due to noise produced by the boats before the potential for a strike occurs. Visual surveys would further ensure clearance of the area. Marine mammals are mobile with excellent underwater hearing, and could therefore avoid small boats. Boat use during obscurant operations would likely be substantially less than recreational boat use in the area. Boat traffic is not likely to directly impact Gulf sturgeon because sturgeon are generally considered a bottom-dwelling species. The likelihood of an encounter with a boat is considered unlikely.

Beachfront Activities

Beachfront activities associated with surf zone testing have the potential to impact sea turtles. Setup activities and exercises associated with mine countermeasures may require beachfront activities involving vehicles, personnel, equipment, and objects such as inert mines and obstacles. Such activities typically require only a small portion of the beach (less than 100 feet of beachfront) and activities typically last only a few days. Vehicle access to the beach may be required, but during sea turtle season vehicle access would be limited to daytime hours. Personnel would be trained to spot sea turtle crawls, instructed to stay away from nests, and informed of other appropriate measures to minimize the potential for direct impacts to sea turtles.

Shrapnel/Direct Hit

Munitions training on SRI is generally conducted with inert rounds. However, the 2005 PEA provides analysis of potential live fire events. Up to approximately 750,000 small arms rounds could be expended annually under Alternative 1; the percentage of this number that would be live fire is unknown but expected to be low. Live fire activities would involve low-range munitions. Small-caliber weapons between 5.56 mm and .50 caliber could be fired in a seaward

direction only. If available, frangible munitions those of nonlead composition would be used to reduce or eliminate potential environmental and safety concerns.

Nighttime use of munitions has the potential to impact sea turtles. The peak sea turtle nesting rates provided in the 2005 PEA are 0.012 nests per night per 0.5 miles for loggerheads, and 0.007 nests per night per 0.5 miles for green sea turtles. Leatherback and Kemp's ridley nesting is small and considered negligible regarding contribution to overall nesting density.

Given the low rate of nesting emergences per day, there is a low probability that nesting sea turtles would be directly impacted by munitions firing; however, firing at night on the beaches should be minimized when possible during sea turtle season. The probability of impact would be further reduced if exercises were conducted outside of the peak nesting season. Management requirements for nighttime live fire missions are provided in Section 2.5. With these requirements in place, small arms firing at night during sea turtle season is not anticipated to directly impact sea turtles. Activities during the day are expected to have no effect.

Live fire operations with munitions directed towards the Gulf also have the potential to impact marine mammals (primarily bottlenose dolphins) and sea turtles in the water. Precautionary measures should be taken to minimize the risk for direct impacts to these species, including pre-mission surveys to certify the test area clear of animals and post-mission surveys to search for any animals potentially injured or killed. These measures would minimize the risk of direct physical impacts from live fire to marine mammals and sea turtles in the water.

Potential for direct impacts to the Santa Rosa beach mouse from live fire is extremely low due to the fact that beach mice tend to spend much of their time in nests that they excavate in the dunes and that they are nocturnal. The potential for a direct strike to wading birds or shorebirds, including the piping plover is considered extremely low. Implementation of the management actions provided in Section 2.5 would further reduce potential strikes. Target areas should be determined clear of birds and other animals before firing. In the event that a bird is located in or near the firing areas, noise would probably flush the bird from the landing area. Displaced birds may simply move to nearby undisturbed foraging areas. Firing of small arms is not anticipated to directly impact the piping plover, wading birds, or shorebird populations on SRI.

Amphibious Assaults

Sea Turtles

Amphibious landings have occurred only once in the recent past, during ARG/MEU training exercises. The number of amphibious operations under Alternative 1 is unknown. Amphibious missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future amphibious missions will involve moderate use of the island, and are expected to result in little to no impacts from noise. The 2005 PEA provides analysis of the estimated number of turtles potentially struck during amphibious landings. The expected maximum number of sea turtles within the vessel transit area would be approximately 16. Some percentage of these individuals may be struck by vessels, but the likelihood is considered small. Adult turtles may be able to avoid collision with LCUs because these vessels move slowly. LCACs produce loud noise that might be detected

some distance away. The greatest potential risk was considered in the 2005 PEA to be direct contact with hatchlings during sea turtle season. This potential would be reduced through avoidance of *Sargassum* mats. Activity occurring outside of sea turtle season is not anticipated to directly impact sea turtles.

During sea turtle season, AAV use would be restricted to daytime hours. Prior to sunset, ruts would be removed from the sand. Coordination with the Natural Resources Section would be necessary to ensure that no sea turtle nests were located in the maneuver area prior to AAV operations. Outside of sea turtle season, AAVs could maneuver freely day or night.

Heavy troop maneuvers also have the potential to directly impact sea turtles, but it is unlikely. Of more concern is the potential for these maneuvers to obscure evidence of sea turtle crawls and nests. To prevent this, all corridors would be surveyed for evidence of sea turtle activity immediately prior to night activities. Troops would be instructed to remain within designated troop movement areas on the beach.

Direct physical impacts to adults, hatchlings, and/or nests are possible from tracked vehicles, wheeled vehicles, and troop movement. However, adherence to proper avoidance and minimization measures, which are provided in Section 2.5, can greatly reduce the potential for direct impacts to sea turtle populations.

Marine Mammals

Bottlenose and Atlantic spotted dolphins and manatees occur within the nearshore portion of the ROI. Analysis provided in the 2005 PEA estimated that approximately seven dolphins would occur in the operations area. However, dolphins would easily avoid collision because the vessels move slowly, and LCACs produce noise that would be detected some distance away and would be avoided as any other boat in the Gulf. The ability of manatees to avoid these craft is unknown but is considered less than that of dolphins. Manatee occurrence is expected to be lower than that of dolphins, particularly during winter. Amphibious craft activities offshore of SRI are not anticipated to directly impact marine mammal individuals or populations.

Birds

Movement of tracked and wheeled vehicles, LCACs, and troops may occur in areas close to piping plover foraging habitat, shorebird habitat, or wading bird habitat. Short-term activities would likely temporarily flush birds from the area, minimizing the chance of a direct physical impact. However, impacts to nests, chicks, and eggs could result from trampling or crushing due to vehicle and troop maneuvers. As a result, shorebird nesting areas should be avoided during nesting season (01 March to 31 August).

Perforate Reindeer Lichen

Perforate reindeer lichen could be trampled or crushed due foot and vehicle traffic. Locations of the lichen have been fenced off and marked with signs so these areas can easily be identified and avoided. With the marking and fencing of lichen locations, no direct impacts to lichen are anticipated from amphibious or ground maneuvers.

Santa Rosa Beach Mouse

No impacts are anticipated from LCAC crossovers due to the “hovercraft” nature of the vehicle. Tracked and wheeled vehicle traffic has the potential to crush the beach mouse, but the risk of this is relatively low since this type of traffic is limited in dune areas, which is the primary habitat for the beach mouse.

Gulf Sturgeon

While in the Gulf of Mexico, Gulf sturgeon are thought to spend the majority of their time at or near the bottom feeding on invertebrates in the substrate. Therefore, the effects of the use of LCACs and Zodiacs, which have a shallow draft, are considered insignificant. AAVs and LCUs, which are tracked vehicles that have a draft of up to 7 feet, have the potential to directly impact sturgeon, but it is unlikely given that these vehicles are slow and would allow the sturgeon ample time to avoid them. Direct impacts from AAVs and LCUs on Gulf sturgeon are not anticipated.

Habitat Alteration

As described for the No Action Alternative, habitat alterations refer to physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to a species. Habitats may be altered by a variety of factors, including changes in vegetation, structure, food sources, breeding and nesting areas, etc. Habitat alteration may lead to decreased barrier island stability, decreased species survival, or degradation of areas critical to species diversity.

Sensitive Habitats

Potential impacts to sensitive habitats, which were identified in the 2005 PEA as Coastal Protection Areas and dune communities, would be similar to those described under the No Action Alternative. Coastal Protection Areas were designated on SRI based on a 1992 FNAI report; the current, post-hurricane condition of these sites unknown. Until surveys are conducted to assess current conditions, troop movement in these areas should be limited to areas seaward of the dunes and vehicle movement should be restricted to a relatively narrow corridor close to the shoreline and on designated roads. Coastal Protection Areas could occur near or within the LCAC corridor and some maneuver areas. However, given that these LCAC sites were chosen for their relative flatness and lack of substantial vegetation, it is likely that these areas were negatively impacted by recent hurricanes and would no longer be considered as Coastal Protection Areas. Therefore, impacts to these sensitive areas are expected to be minimal.

Operations in dune habitat would be restricted to only those activities that have minimal impact to ground cover and dune structure. LCAC operation would not likely result in a significant change in dune height. Vehicle traffic and troop maneuvers would avoid dunes taller than five feet and large sea oat clumps to minimize impacts. Vehicles would remain on existing roads whenever possible. Vehicular movement corridors would be limited to the minimum size necessary, and corridors would be marked so as to be easily distinguished.

Wildfires

Small wildfires have occurred in the past as a result of pyrotechnics use. Natural wildfires are expected about once every 20 to 80 years in scrub communities, but natural fires in other island communities are rare. Therefore, efforts should be taken to minimize the likelihood that human-induced wildfires are started in any of the ecological communities. Alteration of the natural fire regime could lead to changes in the composition and structure of vegetative communities. If wildfires are started near buildings or other structures, they should be contained as quickly as possible. However, given the patchy fuels and prevalent north/south wind on the island, it is likely that the fires would not cover much area.

Invasive Non-Native Species

Potential impacts due to the introduction of invasive non-native species are the same as those described in the No Action Alternative. Invasives could threaten the health of native species, such as the federally listed perforate reindeer lichen and sensitive marsh communities. Secondary impacts can include degradation of food sources and shelter for native animals such as the piping plover. To reduce opportunities for invasive plants to invade, disturbances should be minimized and localized when possible. Natural Resources Section staff should be notified when missions will occur in areas known to contain invasive species. Management recommendations to reduce the spread of invasive plants associated with mission activities are provided under the No Action Alternative; if followed, the likelihood that island missions would transport invasive species is low.

Artificial Lighting

Potential impacts due to artificial lighting are the same as those described under the No Action Alternative. Mission-related lighting could affect nesting adult and hatching sea turtles. Any helicopter insertions would be brief and lighting would be kept to a minimum; thus no impacts from helicopter lights are anticipated. For other activities such as vehicle and troop maneuvers or equipment setup on the beachfront, lighting would be minimized through reduction, shielding, lowering, and appropriate placement of lights. Personnel conducting work, including driving and/or operating equipment on or adjacent to the beach, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights and lighting on equipment at night.

Missions that routinely require nighttime conditions should avoid sea turtle locations and seasons (01 May to 31 October) if possible. If not possible, management actions may include conversion to low-pressure sodium vapor lighting, use of light shields to protect critical dune areas, and turning off unnecessary nonmission or safety lights. Management measures, including fencing off active nests and redirecting any disoriented hatchlings, should be employed. Mission personnel would need to work with the Natural Resources Section to implement these management measures.

Sensitive Animal Species Habitat

Habitat impacts may affect the health of a number of sensitive animal species on SRI, which were identified in the 2005 PEA as the Santa Rosa beach mouse, sea turtles, piping plover, wading birds, and shorebirds. Potential impacts to these habitats are the same as those described in the No Action Alternative and include the disturbance of nesting and feeding areas by ground troops and vehicle/equipment traffic. Avoidance of known nesting and feeding areas is the best method to minimize impacts to sensitive animal species. Coordination with Natural Resources Section staff would be required to determine the habitats of sensitive species, which in some cases would be marked.

Sea Turtles

LCAC movement is not expected to produce ruts in the sand because they travel approximately four feet above the ground. However, sand blown from beneath the air cushion may obscure evidence of sea turtle activity, interfering with surveyors' ability to locate, mark, and protect nest sites. Vehicle and heavy troop movement may also obscure evidence of sea turtle crawls and nests. The LCAC corridor would therefore be surveyed for evidence of sea turtle activity immediately prior to night activities. Vehicles and troops would be instructed to remain within the designated movement corridors and avoid dunes over five feet high, thereby reducing impacts to nesting habitat.

Vehicle use during amphibious assault training and beachfront activities associated with surf zone testing has the potential to impact sea turtle habitat. However, only a limited number of vehicles/craft would be left on the beach at any given time. Setup activities and exercises associated with mine countermeasures would require only a small portion of the beach (typically less than 100 feet). Personnel driving vehicles on the beach would be instructed to avoid dunes greater than five feet in height and, during sea turtle season, all ruts would be removed prior to sunset. Tracked vehicle movement corridors would be clearly marked. Adherence to the avoidance and minimization measures provided in Section 2.5 can greatly reduce the potential for adverse impacts to sea turtle habitat.

Birds

Piping plover critical habitat is situated on the north shore of SRI near A-18. Troop and vehicle movement may occur near possible piping plover foraging areas (sand/mud flats) on the north shore of the island and have the potential to impact critical habitat. Large troop maneuvers and vehicle movements (including LCACs) would be limited to areas outside of piping plover critical habitat. Activities associated with amphibious landings would not occur in or near piping plover critical habitat.

Wading birds forage mainly in wetland areas or along shorelines of saltwater and freshwater bodies. A breeding area for several wading bird species is present along the west shore of East Pass on SRI. Vehicle traffic and substantial troop movement through these areas has the potential to impact wading bird habitat. Colonies or individual nests of several shorebird species are usually found along the rack line or other suitable habitat along the beach, and have the potential to occur within mission areas. As a result, any activity that occurs on SRI within the

breeding seasons of these birds has the potential to impact reproductive success. Avoidance measures would minimize the potential for these species or their habitats to be impacted.

Santa Rosa Beach Mouse

Potential impacts to Santa Rosa beach mouse habitat are the same as those described for the No Action Alternative. The primary foraging and sheltering habitat of the beach mouse is within the primary, secondary, and tertiary sand dunes of SRI. Vehicles and troops are expected to avoid dunes greater than five feet high. This measure would reduce potential impacts to beach mice and their burrows. Avoiding dunes would also reduce impacts to the dune vegetation, which serves as a food source for this species. In 2004, Eglin AFB Natural Resources Section began conducting monthly beach mouse track count surveys in the vicinity of the LCAC crossover area. In addition to these monthly surveys, Eglin also began conducting tracking tube surveys every other month in 2010 in accordance with Florida FWC protocols. Data from these surveys provide presence/absence information and are expected to indicate any substantial change in beach mouse populations on SRI. Ground maneuvers are not anticipated to adversely impact Santa Rosa beach mouse habitat.

Essential Fish Habitat

The habitat on the Gulf side of SRI is a sandy/silty substrate, which does not support seagrass beds. The nearest major seagrass bed in the Gulf of Mexico (versus Santa Rosa Sound) is located to the southeast of Cape San Blas, outside of the study area; therefore, there are no potential impacts to seagrasses that serve as EFH. *Sargassum* is a free-floating algae that drifts as mats in oceanic eddies. Management requirements from previous operations require missions to avoid *Sargassum* mats. Missions offshore of SRI would also avoid *Sargassum* mats; thus there would be no impacts to *Sargassum* that functions as EFH.

Artificial reefs occur offshore of A-4. These reefs are over a mile out and are not located near any of the proposed surf zone test areas or landing areas. A shipwreck east of A-15A is located near the LCAC corridor, but due to the “hovercraft” nature of the LCAC, there would be no impacts below the surface of the water. Contact between AAVs and LCUs, which would land at A-13B during amphibious assault training, could affect the shipwreck’s utility as fish habitat as well as cause damage to the surface craft. If this structure is avoided, the proposed activities conducted at SRI are not likely to adversely impact EFH.

Gulf Sturgeon

During amphibious assault training, LCUs and AAVs could affect Gulf sturgeon habitat. LCUs have a draft of 7 feet and would likely cause ruts in bottom sediments where they land offshore of SRI. Sandy, muddy substrate may also be affected by tracked AAVs landing at SRI. However, due to the small impact area, impacts to the Gulf sturgeon through habitat alteration are not anticipated. Due to the shallow draft of the Zodiacs and the “hovercraft” nature of the LCACs, these vehicles are not anticipated to impact Gulf sturgeon critical habitat.

4.4.3 Alternative 2

This section discusses potential impacts to biological resources from activities associated with Alternative 2. Impact analysis follows the format of the 2005 SRI Mission Utilization Plan PEA (U.S. Air Force, 2005) and the No Action Alternative of this document, which provides analysis according to general effector categories. These categories include as noise, direct physical impact, and habitat alteration.

Noise

The mission categories considered most likely associated with potential noise impacts are the same as those described in the previous alternatives, and include aircraft and LCAC operations, gunnery and missile missions, amphibious craft operation, and surf zone missions

Aircraft Noise

Brief helicopter landings and low-altitude helicopter operations (less than 5 minutes for each activity) occur about during U.S. Army Ranger Los Banos training. Current training occurs once per month; there is no known planned increase in mission tempo. Potential impacts would therefore be the same as those described in previous alternatives. Helicopter operations can potentially occur with other missions such as ARG/MEU training, although the number of missions is not quantified. Helicopter noise would not significantly affect sea turtles or shorebirds (including the piping plover), even if the number of missions increases. The probability of a nesting female attempting come ashore during the time of brief helicopter operations is considered low. Startled shorebirds would return to the area soon after the incident. Nevertheless, it would be preferable to avoid plover critical habitat during wintering season (15 July to 15 May) and shorebird nesting and feeding areas during nesting season (01 March to 31 August).

OA-HITL tower operations may result in startle responses to shorebirds in the immediate vicinity of the tower and may interfere with sea turtle nesting activity if operations are conducted at night. Although the number of OA-HITL tower operations is not quantified, effects similar to helicopter operations would be expected. The duration of these events would be short-term, and shorebirds would likely return to nesting sites rather quickly. Night operations during peak sea turtle nesting (May through August) may result in the deterrence; reduced night operations during nesting season are recommended.

LCAC Noise

Noise from LCAC use on land and water would not impact sea turtles and shorebirds. The number of LCAC operations under Alternative 2 is unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts from noise. A low number of sea turtles (approximately 1.6) would be present per square mile of LCAC operations, with only about 0.5 turtles present at the surface. Previous Section 7 consultation under the ESA for ARG/MEU training specified that nighttime LCAC activities should be minimized during sea turtle season.

LCAC crossovers would not occur in piping plover critical habitat. Although this species could occur in the crossover area, it is likely that noise from LCAC operations would result in only temporary flushing from area. If LCAC operations became sustained at designated crossing corridors, the disturbance could keep piping plovers from foraging in the landing area during the course of the operation. Displaced plovers may simply move to undisturbed foraging areas. The likelihood of sustained operations in the future is unknown.

A least tern colony has been documented within the LCAC crossing corridor. Nesting areas may change over time, and additional least tern colonies could therefore occur within crossover areas. Black skimmers also have the potential to nest on SRI in similar habitats. In addition, snowy plovers could nest anywhere along the rack line or other suitable habitat, which may include the LCAC crossover location. Thus, nesting colonies or individual nests of these three species have the potential to occur within the crossover corridor, and any activity that occurs within the breeding seasons has the potential to impact reproductive success. Therefore, surveys would be required before LCAC use during nesting season. Located nests would be marked and avoided. Wading birds that are designated as species of special concern by the FWC could be temporarily displaced from foraging areas along crossover corridors or along shorelines of saltwater and freshwater water bodies.

The Santa Rosa beach mouse would not be impacted by LCAC noise because primary foraging and sheltering habitat occurs within the dunes. In 2004, Eglin AFB Natural Resources Section began conducting monthly beach mouse track count surveys in the vicinity of the LCAC crossover area. In addition to these monthly surveys, Eglin also began conducting tracking tube surveys every other month in 2010 in accordance with Florida FWC protocols. Data from these surveys provide presence/absence information and are expected to indicate any substantial change in beach mouse populations on SRI.

Impacts to marine mammals from the use of LCACs in the Gulf were not considered an issue of concern by the NMFS.

Surface-To-Air Missile Noise

Up to 12 PATRIOT missile launches could occur annually under Alternative 2. It is expected that that wildlife within 0.2-mile of a PATRIOT missile launch would be exposed to a short duration (11 seconds) of a maximum noise level greater than 115 dBC. Noise levels decrease to less than 95 dBC 2 miles from the launch site. This contour encompasses nearly 12 square miles of water and land. As long as there are no nighttime test events during sea turtle season (01 May to 31 October), no adverse impacts to turtles are anticipated. Nesting shorebirds could potentially be affected, but given the short duration of the launch noise, most birds would likely soon return to their nests.

Small Boat Obscurant Testing

The number of small boat obscurant testing missions associated with Alternative 2 is unknown. No harmful noise levels would be produced from small boats during these activities. However, noise could be a source of deterrence to nesting sea turtles if activities are conducted at night

during sea turtle season. For this reason, according to management requirements, use of small boats at night between May and October should be avoided.

Surf Zone Testing

Los Banos Training, Advanced Skills Training, and HAVE ACE activities each occur 12 times per year for a total of 36 exercises. Under Alternative 2, these exercises could increase as could surf zone testing. Test missions such as ALRT would result in temporary noise and disturbance during set up and take down, but the noise would not be significant.

Gunnery Noise

Although most or all LCAC gunnery training would involve inert munitions (live rounds would only be approved on a case-by-case basis through the AFF 813 process), the 2005 PEA provides analysis for live 30-mm rounds. The number of LCAC operations under Alternative 2 is unknown. LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future LCAC missions will involve moderate use of the island, and are expected to result in little to no impacts from gunnery noise. During live training, it is likely that species in the immediate vicinity of the LCAC would move outside of the maneuver area due to the general disturbance. Noise from 30-mm gunfire is therefore not anticipated to directly affect animal species. Birds startled by the noise associated with the firing of the 30 mm may move to other areas, while nesting birds would likely return shortly after the exercise was completed. Firing of 30 mm from LCACs should be avoided during evening hours from May to October in order to avoid deterrence of sea turtle nesting activities.

Over three million small arms rounds could be expended annually under Alternative 2, although the number of missions associated with this level is not quantified. Species startled by small arms firing would probably move to other areas, while nesting species would return after the disturbance.

Activities conducted at night near the beach during sea turtle season may result in nest deterrence due to noise disturbance. However, nightly nesting emergence rates are low, and there is a low probability that nesting sea turtles would be deterred by munitions firing. However, firing at night on the beaches should be avoided during the peak nesting season for each species (June and July), and night firing should be minimized during hatching season whenever possible.

Amphibious Assault Noise

Amphibious assaults may involve the use of LCACs, LCUs, AAVs, and Zodiac boats within 6 miles or less of the shoreline. The noise created by these vehicles would be expected to deter marine mammals from the immediate area during transit activities, but activities would last only a few hours at most on any given day. Noise impacts to marine mammals from amphibious assaults are anticipated to be minor and short term.

Direct Physical Impacts

Similar to the previous alternatives, direct impacts to wildlife could result from vehicular, aircraft, boat, and foot traffic, gunnery, and missiles. These types of mission activities could potentially cause physical injury to wildlife species. Additionally, vehicular and foot traffic could crush sensitive species, and boats and aircraft could collide with animals.

Vehicle Collision/Foot Trampling

Similar to the previous alternatives, the number of missions involving vehicle and troop movement is unknown, but these missions may take place in many areas of the island. Los Banos Training, Advanced Skills Training, and HAVE ACE activities each currently occur 12 times per year for a total of 36 exercises. Under Alternative 2, these exercises could increase to achieve an optimum usage level, and may involve vehicular and foot traffic. Night operations on the beachfront pose a threat to sea turtle nests, adults, and hatchlings, and may obscure sea turtle tracks. Therefore, nighttime beachfront activities would be minimized when possible during sea turtle season, and management requirements provided in Section 2.5 would be employed. Staging of vehicles/craft on the beachfront is not likely to deter sea turtle nesting because only limited numbers of vehicles/craft would be on the beachfront at any one time. Again, management requirements provided in Section 2.5 would substantially reduce the potential for direct impact to sea turtles.

The locations of perforate reindeer lichen have been fenced off and marked with signs so that these areas can be easily avoided by troops and vehicles. With the marking and fencing of lichen locations, no direct impacts are anticipated from vehicle or foot trampling.

Movement of wheeled vehicles, LCACs, and troops may occur in areas close to shorebird, wading bird, or piping plover habitat. Noise from vehicle and troop activities near foraging and breeding areas would likely temporarily flush the birds from the area, minimizing the chances of a direct physical impact.

Surf Zone Testing

Surf zone testing is not likely to adversely affect a protected species through direct physical impact. There would be no detonations nor shrapnel produced from this type of activity. Surf zone detonations are not part of this alternative, and would require a separate analysis.

Boat Collisions

Small boats may be used for obscurant testing throughout the surf zone, although the number of missions per year is not specified. As described for surf zone testing above, the density of adult and hatchling sea turtles per square mile is less than two turtles. Some percentage of these two individuals may be directly affected by boat traffic, but the likelihood is considered remote. Turtles may leave the area due to noise produced by the boats before the potential for a strike occurs. Visual surveys would further ensure clearance of the area. Marine mammals are mobile with excellent underwater hearing, and could therefore avoid small boats. Boat use during obscurant operations would likely be substantially less than recreational boat use in the area.

Boat traffic is not likely to directly impact Gulf sturgeon because sturgeon are generally considered a bottom-dwelling species.

Beachfront Activities

Beachfront activities associated with surf zone testing have the potential to impact sea turtles. Setup activities may require beachfront activities involving vehicles, personnel, equipment, and objects such as inert mines and obstacles. However, such activities typically require only a small portion of the beach (less than 100 feet of beachfront) and typically last only a few days. Vehicle access to the beach during sea turtle season would be limited to daytime hours. Personnel would be trained to spot sea turtle crawls, instructed to stay away from nests, and informed of other appropriate measures to minimize the potential for direct impacts to sea turtles.

Shrapnel/Direct Hit

Although munitions training on SRI is generally conducted with inert rounds, 2005 PEA provides analysis of potential live fire events. Over three million small arms rounds could be expended annually under Alternative 2; the percentage of this number that would be live fire is unknown but expected to be low. Live fire activities would involve low-range munitions and would be fired in a seaward direction only. Given the low rate of nesting emergences per day (0.012 nests per night per 0.5 miles for loggerheads and 0.007 nests per night per 0.5 miles for green sea turtles), there is a low probability that nesting sea turtles would be directly impacted by munitions firing; however, firing at night on the beaches should be minimized when possible during sea turtle season. The probability of impact would be further reduced if exercises were conducted outside of the peak nesting season. Management requirements for nighttime live fire missions are provided in Section 2.5. With these requirements in place, small arms firing at night during sea turtle season is not anticipated to directly impact sea turtles.

Live fire operations with munitions directed towards the Gulf also have the potential to impact marine mammals (primarily bottlenose dolphins) and sea turtles in the water. Precautionary measures should be taken to minimize the risk for direct impacts to these species, including pre-mission surveys to certify the test area clear of animals and post-mission surveys to search for any animals potentially injured or killed. These measures would minimize the risk of direct physical impacts from live fire to marine mammals and sea turtles in the water.

Potential for direct impacts to the Santa Rosa beach mouse from live fire is extremely low because 1) beach mice tend to spend much of their time in nests excavated in the dunes, and 2) they are nocturnal. The potential for a direct strike to wading birds or shorebirds, including the piping plover is considered extremely low. Implementation of the management actions provided in Section 2.5 would further reduce potential strikes.

Amphibious Assaults

Sea Turtles

Amphibious landings have occurred only once in the recent past, during ARG/MEU training exercises. The number of amphibious operations under Alternative 2 is unknown. Amphibious

missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. The 2005 PEA provides analysis concluding that the expected maximum number of sea turtles within the vessel transit area would be approximately 16. Some percentage of these individuals may be struck by vessels, but the likelihood is considered small. Adult turtles may be able to avoid collision with LCUs because these vessels move slowly. LCACs produce loud noise that might be detected some distance away. The greatest potential risk was considered to be direct contact with hatchlings. This potential would be reduced through avoidance of *Sargassum* mats. Activity occurring outside of sea turtle season is not anticipated to directly impact sea turtles. During sea turtle season, AAV use would be restricted to daytime hours, and ruts would be removed from the sand. Coordination with the Natural Resources Section would be necessary to ensure that no sea turtle nests were located in the maneuver area prior to AAV operations. Outside of sea turtle season, AAVs could maneuver freely day or night.

Sea turtles would not likely be directly impacted during troop movement, but such movement could obscure evidence of sea turtle crawls and nests. To prevent this, all corridors would be surveyed for evidence of sea turtle activity immediately prior to night activities. Troops would be instructed to remain within designated troop movement areas on the beach.

Direct physical impacts to adults, hatchlings, and/or nests are possible from tracked vehicles, wheeled vehicles, and troop movement. However, adherence to proper avoidance and minimization measures, which are provided in Section 2.5, can greatly reduce the potential for direct impacts to sea turtle populations.

Marine Mammals

Bottlenose and Atlantic spotted dolphins and manatees occur within the nearshore portion of the ROI. Analysis provided in the 2005 PEA estimated that approximately seven dolphins would occur in the operations area. However, dolphins would easily avoid collision because the vessels move slowly and produce noise that would be detected some distance away. The ability of manatees to avoid these craft is unknown but is considered less than that of dolphins. Manatee occurrence is expected to be lower than that of dolphins, particularly during winter. Amphibious craft activities offshore of SRI are not anticipated to directly impact marine mammal individuals or populations.

Birds

Movement of tracked and wheeled vehicles, LCACs, and troops may occur in areas close to piping plover foraging habitat, shorebird habitat, or wading bird habitat. Short-term activities would likely temporarily flush birds from the area, minimizing the chance of a direct physical impact. However, impacts to nests, chicks, and eggs could result from trampling or crushing due to vehicle and troop maneuvers. As a result, shorebird nesting areas should be avoided during nesting season (15 March to 31 August).

Perforate Reindeer Lichen

Locations of perforate reindeer lichen have been fenced off and marked with signs so these areas can easily be identified and avoided. With the marking and fencing of lichen locations, no direct impacts to lichen are anticipated from amphibious or ground maneuvers.

Santa Rosa Beach Mouse

No impacts are anticipated from LCAC crossovers due to the “hovercraft” nature of the vehicle. The potential for crushing is considered low because this type of traffic is limited in dune areas, which is the primary habitat for the beach mouse.

Gulf Sturgeon

While in the Gulf of Mexico, Gulf sturgeon are thought to spend the majority of their time at or near the bottom feeding on invertebrates in the substrate. Therefore, the effects of the use of LCACs and Zodiacs, which have a shallow draft, are considered insignificant. AAVs and LCUs, which are tracked vehicles that have a draft of up to 7 feet, have the potential to directly impact sturgeon, but it is unlikely given that these vehicles are slow and would allow the sturgeon ample time to avoid them. Direct impacts from AAVs and LCUs on Gulf sturgeon are not anticipated.

Habitat Alteration

Habitat alterations refer to physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to a species. Habitats may be altered by a variety of factors, including changes in vegetation, structure, food sources, breeding and nesting areas, etc. Habitat alteration may lead to decreased barrier island stability, decreased species survival, or degradation of areas critical to species diversity.

Sensitive Habitats

Potential impacts to sensitive habitats, which were identified in the 2005 PEA as Coastal Protection Areas and dune communities, would be similar to those described under the previous alternatives. Coastal Protection Areas were designated on SRI based on a 1992 FNAI report; the current, post-hurricane condition of these sites unknown. Until surveys are conducted to assess current conditions, troop movement in these areas should be limited to areas seaward of the dunes and vehicle movement should be restricted to a relatively narrow corridor close to the shoreline and on designated roads. Coastal Protection Areas could occur near or within the LCAC corridor and some maneuver areas. However, given that these LCAC sites were chosen for their relative flatness and lack of substantial vegetation, it is likely that these areas were negatively impacted by recent hurricanes and would no longer be considered as Coastal Protection Areas. Therefore, impacts to these sensitive areas are expected to be minimal.

Operations in dune habitat would be restricted to only those activities that have minimal impact to ground cover and dune structure. LCAC operation would not likely result in a significant change in dune height. Vehicle traffic and troop maneuvers would avoid dunes taller than 5 feet and large sea oat clumps to minimize impacts. Vehicles would remain on existing roads

whenever possible. Vehicular movement corridors would be limited to the minimum size necessary, and corridors would be marked so as to be easily distinguished.

Wildfires

Small wildfires have occurred in the past as a result of pyrotechnics use. Natural wildfires are expected about once every 20 to 80 years in scrub communities, but natural fires in other island communities are rare. Therefore, efforts should be taken to minimize the likelihood that human-induced wildfires are started in any of the ecological communities. Alteration of the natural fire regime could lead to changes in the composition and structure of vegetative communities. Wildfires should be contained as quickly as possible. Given the patchy fuels and prevalent north/south wind on the island, it is likely that the fires would not be substantial.

Invasive Non-Native Species

Potential impacts due to the introduction of invasive non-native species are the same as those described in the previous alternatives. Invasive species can threaten the health of native species. Secondary impacts can include degradation of food sources and shelter for native animals such as the piping plover. To reduce opportunities for invasive plants to invade, disturbances should be minimized and localized when possible. Natural Resources Section staff should be notified when missions will occur in areas known to contain invasive species. Management recommendations to reduce the spread of invasive plants associated with mission activities are provided under the No Action Alternative; if followed, the likelihood that island missions would transport invasive species is low.

Artificial Lighting

Potential impacts due to artificial lighting are the same as those described under the previous alternatives. Mission-related lighting could affect nesting adult and hatching sea turtles. Any helicopter insertions would be brief and lighting would be kept to a minimum; thus no impacts from helicopter lights are anticipated. For other activities such as vehicle and troop maneuvers or equipment setup on the beachfront, lighting would be minimized through reduction, shielding, lowering, and appropriate placement of lights. Personnel conducting work, including driving and/or operating equipment on or adjacent to the beach, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights and lighting on equipment at night.

Missions that routinely require nighttime conditions should avoid sea turtle locations and seasons (01 May to 31 October) if possible. If not possible, management actions may include conversion to low-pressure sodium vapor lighting, use of light shields to protect critical dune areas, and turning off unnecessary nonmission or safety lights. Management measures, including fencing off active nests and redirecting any disoriented hatchlings, should be employed. Mission personnel would need to work with the Natural Resources Section to implement these management measures.

Sensitive Animal Species Habitat

Habitat impacts may affect the health of a number of sensitive animal species on SRI, which were identified in the 2005 PEA as the Santa Rosa beach mouse, sea turtles, piping plover, wading birds, and shorebirds. Potential impacts to these habitats are the same as those described in the previous alternatives and include the disturbance of nesting and feeding areas by ground troops and vehicle/equipment traffic. Avoidance of known nesting and feeding areas is the best method to minimize impacts to sensitive animal species. Coordination with Natural Resources Section staff would be required to determine the habitats of sensitive species, which in some cases would be marked.

Sea Turtles

LCAC movement is not expected to produce ruts in the sand because they travel approximately four feet above the ground. However, sand blown from beneath the air cushion may obscure evidence of sea turtle activity, interfering with surveyors' ability to locate, mark, and protect nest sites. Vehicle and heavy troop movement may also obscure evidence of sea turtle crawls and nests. The LCAC corridor would therefore be surveyed for evidence of sea turtle activity immediately prior to night activities. Vehicles and troops would be instructed to remain within the designated movement corridors and avoid dunes over five feet high, thereby reducing impacts to nesting habitat.

Vehicle use during amphibious assault training and beachfront activities associated with surf zone testing has the potential to impact sea turtle habitat. However, only a limited number of vehicles/craft would be left on the beach at any given time. Setup activities and exercises associated with mine countermeasures would require only a small portion of the beach (typically less than 100 feet). Personnel driving vehicles on the beach would be instructed to avoid dunes greater than five feet in height and, during sea turtle season, all ruts would be removed prior to sunset. Tracked vehicle movement corridors would be clearly marked. Adherence to the avoidance and minimization measures provided in Section 2.5 can greatly reduce the potential for adverse impacts to sea turtle habitat.

Birds

Troop and vehicle movement may occur near possible piping plover foraging areas (sand/mud flats) on the north shore of the island and have the potential to impact critical habitat. Birds startled by these activities would likely find nearby suitable foraging habitat. Large troop maneuvers and vehicle movements (including LCACs) would be limited to areas outside of piping plover critical habitat. Activities associated with amphibious landings would not occur in or near piping plover critical habitat.

Wading birds forage mainly in wetland areas or along shorelines of saltwater and freshwater bodies. A breeding area for several wading bird species is present along the west shore of East Pass on SRI. Vehicle traffic and substantial troop movement through these areas have the potential to impact wading bird habitat. Colonies or individual nests of several shorebird species are usually found along the rack line or other suitable habitat along the beach, and have the potential to occur within mission areas. As a result, any activity that occurs on SRI within the

breeding seasons of these birds has the potential to impact reproductive success. Avoidance measures would minimize the potential for these species or their habitats to be impacted.

Santa Rosa Beach Mouse

The primary foraging and sheltering habitat of the beach mouse is sand dunes. Vehicles and troops would avoid dunes greater than five feet high. This measure would reduce potential impacts to beach mice and their burrows, and to dune vegetation that serves as a food source for the species. In 2004, Eglin AFB Natural Resources Section began conducting monthly beach mouse track count surveys in the vicinity of the LCAC crossover area. In addition to these monthly surveys, Eglin also began conducting tracking tube surveys every other month in 2010 in accordance with Florida FWC protocols. Data from these surveys provide presence/absence information and are expected to indicate any substantial change in beach mouse populations on SRI. Ground maneuvers are not anticipated to adversely impact Santa Rosa beach mouse habitat.

Essential Fish Habitat

The habitat on the Gulf side of SRI is a sandy/silty substrate, which does not support seagrass beds. The nearest major seagrass bed in the Gulf of Mexico (versus Santa Rosa Sound) is located to the southeast of Cape San Blas, outside of the study area; therefore, there are no potential impacts to seagrasses that serve as EFH. *Sargassum* is a free-floating algae that drifts as mats in oceanic eddies. Management requirements from previous operations require missions to avoid *Sargassum* mats. Missions offshore of SRI would also avoid *Sargassum* mats; thus there would be no impacts to *Sargassum* that functions as EFH.

Artificial reefs occur offshore of A-4. These reefs are over a mile out and are not located near any of the proposed surf zone test areas or landing areas. A shipwreck east of A-15A is located near the LCAC corridor, but due to the “hovercraft” nature of the LCAC, there would be no impacts below the surface of the water. Contact between AAVs and LCUs, which would land at A-13B during amphibious assault training, could affect the shipwreck’s utility as fish habitat as well as cause damage to the surface craft. If this structure is avoided, the proposed activities conducted at SRI are not likely to adversely impact EFH.

Gulf Sturgeon

During amphibious assault training, LCUs and AAVs could affect Gulf sturgeon habitat. LCUs have a draft of 7 feet and would likely cause ruts in bottom sediments where they land offshore of SRI. Sandy, muddy substrate may also be affected by tracked AAVs landing at SRI. However, due to the small impact area, impacts to the Gulf sturgeon through habitat alteration are not anticipated. Due to the shallow draft of the Zodiacs and the “hovercraft” nature of the LCACs, these vehicles are not anticipated to impact Gulf sturgeon critical habitat.

4.5 CULTURAL RESOURCES

In accordance with AFI 32-7065, the specific locations of certain cultural resources are not identified in public documents in order to protect these sites from looting and vandalism. This

specific information is sensitive and can be acquired from the 96th Civil Engineer Group Cultural Resources (96 CEG/CEVSH) as required.

The entire project area, both terrestrial and marine contexts, has previously been surveyed for cultural resource presence/absence. Due to this comprehensive survey work, the locations of extant cultural resources are well known on SRI. Due to the location of the resources in a coastal, barrier island environment, there is constant erosion caused by tropical storms, wind, and waves. As the sand shifts existing sites may degrade and new sites may be uncovered. Under all alternatives, in the event of an inadvertent discovery, all training and testing will cease until Eglin's Base Historic Preservation Officer and 96 CEG/CEVSH are notified and the area is further inspected.

4.5.1 No Action Alternative

The No Action Alternative represents the previously approved level, types, and locations of activities at SRI and would not adversely affect cultural resources.

4.5.2 Alternative 1

Land-disturbing as well as sediment-disturbing activities such as ground training, amphibious landing activities and surf zone testing would occur during certain mission and training activities. These activities all have the potential to adversely affect cultural resources. The mission locations shown in Figure 2-3 have been coordinated with 96 CEG/CEVSH to avoid potential impacts to sensitive cultural resources. However, further coordination with 96 CEG/CEVSH would be required prior to any activities outside of currently approved test and training areas or above levels currently represented by the No Action Alternative through completion of an Air Force 813 form. Prior to any additional proposed activities, mitigative or protective measures may be required for known archaeological sites or historic structures.

Ongoing activities require that NRHP eligible resources are clearly marked and considered off limits and as a result would not be adversely affected. In the event of an inadvertent discovery, all training and testing will cease until Eglin's Base Historic Preservation Officer and 96 CEG/CEVSH are notified and the area is further inspected.

4.5.3 Alternative 2

Any anticipated effects to cultural resources are identical to those presented under Alternative 1.

4.6 AIR QUALITY

The types of missions occurring on SRI that affect air quality include surf zone testing, boat operations, missile launches, and ground operations in which vehicles are involved.

4.6.1 No Action Alternative

The baseline level of testing and training authorized in the SRI PEA considered the affects of testing and training operations involving the use of various types of vehicles, obscurants, and other munitions. The 2005 PEA found air quality not to be a substantial issue, thus was not analyzed quantitatively. Amphibious landings and crossings of SRI were analyzed in a major action, the ARG/MEU, which found emissions were a minor contribution to total county emissions. Testing and training expenditures have also been quantified in a number of other REA's (i.e., Test Areas B-70 and B-75). Munitions emissions are minute compared with both the NAAQS and county emissions. Emissions from missile launches and boat and vehicle operations are temporary, on the order of hours. No adverse impacts are expected from the No Action Alternative to regional air quality.

4.6.2 Alternative 1

The current and foreseeable future mission activities would be authorized under this alternative which analyzes the maximum munitions use. The types of operations that occur on SRI use primarily small arms, smokes, flares, chaff, and some missiles. The majority of emissions would be from smokes/obscurants. These would cause a temporary and localized increase in particulate matter emissions. The overall affect when compared with the NAAQS and Santa Rosa and Okaloosa Counties is negligible. No adverse impacts to air quality are expected under Alternative 1.

4.6.3 Alternative 2

Alternative 2 would authorize an increase in mission activities which would mean an increase in expenditures on SRI. The types of munitions and the quantities used would not be sufficient to cause noticeable degradation to the regional air quality. There would be a minor and temporary increase in emissions during the use of obscurants or flares. Even with increased munitions use the emissions would not be substantial enough to cause levels to be greater than the NAAQS or greater than 10 percent of the county's baseline levels. No adverse impacts to regional air quality are expected from Alternative 2.

4.7 NOISE

As discussed in Section 3.7, various noise metrics are used to help quantify noise. For impacts due to low frequency impulsive noise such as an explosion, peak sound pressure levels (dBp) are used to express noise intensity. In this assessment, noise is quantified for aircraft, LCAC, gunnery, and missiles as it affects anthropogenic resources. Noise impacts to biological receptors are discussed in Section 4.4.

Various sociological surveys and recommendations of the federal interagency councils have resulted in common benchmarks of a day-night average sound level of 65 dBA for A-weighted noise and 62 dBC for C-weighted noise. These thresholds are often used to determine residential

land use compatibility and risk of human annoyance. Other noise levels are also useful in assessing environmental impacts to people:

- A day-night average noise level of 55 dBA was identified by the U.S. Environmental Protection Agency (USEPA) as a level that would protect the public health and welfare with an adequate margin of safety. The 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, 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 (Russell, 2001, as cited in U.S. Air Force, 2005).
- Florida Statute 327.60(1) addresses noise exposure to humans from passing boats. The statute states that in order to prevent potential annoyance impacts to people from a single noise event, no vessel may exceed a sound level of 90 A-weighted decibels over a 1-second duration, also referred to as A-weighted sound exposure level (ASEL), at a distance of 50 feet from the vessel.
- The Eglin Noise Study suggested a voluntary noise exposure limit of 95 ASEL for low-flying aircraft. This threshold would be applicable for helicopter drop zones over the water.

Annoyance is the most common impact associated with noise exposure. It is desirable to maintain noise levels less than 65 dBA and 62 dBC day-night averages to minimize the percent of the population which would be highly annoyed. Residential areas, schools, hospitals, and businesses are likely locations where annoyance and other noise effects could be a concern.

4.7.1 No Action Alternative

The No Action Alternative approves the baseline level of test and training activities within the SRI ROI as described in the Preferred Alternative of the Santa Rosa Island Mission Utilization Plan PEA (U.S. Air Force, 2005). This section discusses each activity type and the associated potential noise impacts to people.

Electronic Systems/ ECM Testing/Training

These test/training activities are not likely to cause any noise impacts to the public.

Aircraft Noise

Noise from crossover flights through established air corridors are addressed in the *Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force, 1998a).

Helicopter Noise

Helicopter noise would likely most affect persons located on shore or in near-shore Gulf waters during personnel/equipment drops and extractions. Personnel and equipment drops occurring in the sound are addressed in the *Estuarine and Riverine Areas Programmatic Environmental Assessment* (U.S. Air Force, 2004). Table 4-2 shows the sound exposure levels for an HH-53 helicopter at the drop zones and landing zones at several distances. At a distance of 500 feet, noise would not exceed 95 ASEL. The distance between the island and the mainland shoreline exceeds 1,000 feet; therefore, the public would not be exposed to noise greater than 95 ASEL from helicopters at landing zones on SRI. Training would not be conducted until the drop zone and surrounding areas are clear of nonparticipating vessels and aircraft. Therefore, other vessels would not be exposed to impactive noise levels.

OA-HITL Tower Aircraft Traffic Noise

Noise levels due to aircraft passing within 100 feet of the OA-HITL, and as low as 200 feet above ground level, were analyzed in the *Final Environmental Assessment for Santa Rosa Island Reconstitution Test Capabilities* (U.S. Air Force, 1998c), which is the basis for the information presented in this section (Table 4-3). No significant noise impacts from east-west flight profiles passing the OA-HITL tower are expected to the residential areas to the north of Santa Rosa Sound or on recreation lands to the west of Eglin AFB-controlled lands on SRI. Operational constraints may be required for north-south profiles as a single aircraft overflight of the OA-HITL tower produces a ground noise level up to 115 dBA SEL (65.5 L_{dn}) over existing residential areas north of Santa Rosa Sound. The use of certain flight maneuvers have been shown to reduce single event aircraft noise by 10 to 12 dBA, thus reducing the level of sound reaching the north shore where receptors are located.

Table 4-2. Sound Exposure Levels for an HH-53 Helicopter

Distance (feet)	Sound Exposure Level ¹
200	101.4
250	99
315	98.4
400	96.8
500 Threshold	95.2 Threshold
630	93.6
800	91.9
1,000	90.2
1,250	88.4
1,600	86.6
2,000	84.7
2,500	82.8
3,150	80.7

Distance (feet)	Sound Exposure Level ¹
4,000	78.6
5,000	76.4
6,300	74.0
8,000	71.5
10,000	68.8
12,500	66.0
16,000	63.0
20,000	59.9
25,000	56.4

Source: U.S. Air Force, 1996, as cited in U.S. Air Force, 2005

1. dBA based on 100 percent RPM, at 59°F, 70 percent relative humidity

Table 4-3. Two Aircraft Air-to-Ground Approximate SELs at Varying Distances from Site A-13/A-14

Aircraft and SEL	Near OA-HITL Tower	Wynnhaven Beach Shore Line 6,000 ft	Navarre Beach Front Streets 25,000 ft
F-16 Air-to-Ground dB SEL	118.0	88	74
F-16 Air-to-Ground dB SEL	99.9	73	59

dB = decibels; ft = feet; OA-HITL = open air hardware in the loop; SEL = sound exposure level

LCAC Noise, Including Amphibious Assaults and Single Event Noise

Potential noise impacts to the to the public resulting from the operation of LCACs within the sound have been assessed in the *Estuarine and Riverine Programmatic Environmental Assessment* (U.S. Air Force, 2004) and are not addressed in this document. The effects of noise associated with LCAC crossings at TA A-13B and use in the Gulf were evaluated in the *ARG/MEU Environmental Assessment* (U.S. Air Force, 2003c). Based on the Air Force’s Acoustic Effects Branch (AL/OBEN) Excess Sound Attenuation Model for the LCAC’s engines under ground run-up conditions, the maximum noise level (98 dBA) results at a point 45 degrees from the bow of the craft at a distance of 200 feet. Maximum noise levels fall below 90 dBA at distances more than 400 feet from the craft (Table 4-4).

Table 4-4. Summary of Estimated LCAC Noise Impacts at Distance

Distance from LCAC (ft)	Noise Level (dBA)
200	98
400	89
800	80
1,000	77
2,000	68

Source: U.S. Air Force, 2005

Note: Measures represent estimates during LCAC operation.

Noise exposure from LCACs in transit was estimated by considering the noise source moving laterally in front of a receptor 300 feet perpendicular to the track of the craft. With the craft traveling at approximately 40 knots, the SEL at the receptor was calculated for the total noise event (approximately 16 seconds in duration). This single-day equivalent event was estimated to result in a 24-hour equivalent sound level ($L_{eq(24)}$) of approximately 52 dBA at that specific receptor.

Expanded LCAC operations/amphibious assaults aggregate noise levels at a range of distances from the maneuver areas are shown in Table 4-5. These are the equivalent noise levels resulting from one operation in a 24-hour period [$L_{eq(24)}$]. This estimate assumes that all exercises occur in the same maneuver area, providing a conservative estimate.

Table 4-5. LCAC Maneuver Noise Levels

Distance from Edge of Maneuver Area (ft)	Noise Levels: 1 Operation [$L_{eq(24)}$]	
	Leading Edge	Lateral Edge
500	53.7	52.9
1,000	49.5	49.0
1,500	46.8	46.6
2,000	44.8	44.6
2,500	43.1	43.0

A single event noise from LCAC operations would produce noise of approximately 90 ASEL just under a distance of 400 feet. The LCAC is equipped with four A VCO-Lycoming aircraft-type engines, which do not comply with the Florida boat noise statute due to their sizeable horsepower. To comply with the Florida statute by restricting and prohibited areas such that other vessels would not be exposed to noise and by maintaining a distance of at least 400 feet from residential areas. Noise impacts associated with amphibious exercises on SRI were analyzed in the ARG/MEU Environmental Assessment. Although the ARG/MEU only analyzes the 7-mile training area and crossover location at A-13B, the impacts and avoidance and minimization measures presented are applicable to the other crossover locations on the island given the similarity of conditions. The findings are summarized below.

The exercise area was described as an area of 8,000 feet seaward of the beach, including the beach area, and continuing 3,000 feet inland. Activity was assumed to occur in waves; thus, noise was estimated for one wave of activity, with a wave consisting of several LCACs, AAVs, and LCU, and other land-based equipment. Aggregated noise levels at a range of distances from the indicated edges of the exercise area are shown in Table 4-6.

Table 4-6. Noise from Amphibious Landing (One Exercise Wave) in A-Weighted Decibels

Distance (ft)	Leading Edge		Lateral Edge	
	$L_{eq(1)}$	Equivalent Operation	$L_{eq(1)}$	Equivalent Operation
500	68.7	2,344.2	76.7	14,791.1
1,000	65.3	1,071.5	72.7	5,888.4
2,000	62.1	512.9	68.2	2,089.3
3,000	60.2	331.1	65.4	1,096.5
Distance (ft)	$L_{eq(24)}$	Equivalent Operation	$L_{eq(24)}$	Equivalent Operation
500	54.9	97.7	62.9	616.6
1,000	51.5	44.7	58.9	245.5
2,000	48.3	21.4	54.4	87.1
3,000	46.4	13.8	51.6	45.7

$L_{eq(1)}$ = Equivalent noise level in a 1-hour period
 $L_{eq(24)}$ = Equivalent noise level in a 24-hour period

Noise from LCAC crossovers would not exceed 95 ASEL at a distance of 400 feet. No single noise exposure from LCAC operations on SRI should result in annoyance to the public with the

nearest point to the mainland shoreline is 1,000 feet from the island. Expanded LCAC and amphibious assault activities would not cause noise levels greater than 90 ASEL in residential or commercial areas, therefore no nonparticipant would be exposed to potentially harmful noise levels. All marine traffic within 1-mile of the activity would be restricted during the mission, thus harmful impacts to boaters are highly unlikely.

Surface-to-Air Missile Noise

Noise impacts from S/A missile testing have been analyzed in the *Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement – Eglin Gulf Test Range* (U.S. Air Force, 1998d), *Final Environmental Assessment for Projected PATRIOT Testing (5-Year Plan)* (U.S. Air Force, 2002a), and the *Biological Assessment for Projected PATRIOT Testing* (U.S. Air Force, 2002d). PATRIOT missile launch primary noise impacts are the subsonic sounds which may affect the public and structures in the launch area. A launch typically generates impulse noise of 145 dBC (170 dBP) at a distance of 800 feet from the rear of the missile (U.S. Army, 1990, as cited in U.S. Air Force, 2005). Noise overpressure levels of 140 dBP and 115 dBP are the standards used for human hearing protection requirements and annoyance to the public, respectively. TA A-15 is closed to public access from the mean high-tide line of the Gulf of Mexico landward. Temporary (less than 4 hours) closures of the safety footprint would be imposed to protect the public from exposure to potentially harmful levels of blast pressure and noise. With the closures and location of TA A-15, the public would be well outside of the 115 dBP sound pressure level contour. Thus, civilians would not be exposed to harmful noise and damaging blast pressure levels.

Detonation Noise

Detonation impacts are described by two categories: overpressure and acoustics. When an explosive is detonated, a pressure wave in the atmosphere is produced that can have potentially lethal and injurious impacts depending on the receptor and the proximity to the source. Safe distances would vary according to the specific explosive used. Detonation amounts would be less than 0.66 lbs for door breaching. Public areas outside of the Air Force property are well outside of the 140 dBP safety limit. Therefore, it is unlikely that detonations would impact the public.

Gunnery Noise – LCAC 30-mm Live Fire

Live rounds are generally not used on SRI. However, only impulsive noise from 30-mm ammunition was analyzed in the baseline analysis. Live 30-mm rounds would only be used on a case-by-case basis approved through the AFF 813 process. These rounds produce 155 dBP sound pressure levels (SPL) at one meter from the source, requiring hearing protection for personnel in close proximity to the weapon. Noise attenuates (decreases) rapidly with increased distance, and because safety zones are required (which evacuates all nonparticipants from the area), no harmful noise levels would affect the public. Neither average nor single-event noise thresholds would be exceeded from the 30-mm live fire. The closure of the area to those not participating in the operations would provide safe distances to the public from noise exposure.

Small Arms Live Fire

Live fire operations involving the use of small-caliber weapons between 5.56 mm and .50 cal are discussed in this section. Similar to the 30-mm live fire discussion, impulsive noises would require those participating in the operations to use hearing protection. Once again, due to safety criteria, nonparticipants would be evacuated from the area and at a sufficient distance from the noise so as to avoid exposure to harmful noise levels. Assuming 1,000 rounds of varied-caliber ammunition in a 1,000-foot by 1,000-foot area, noise levels would be less than 61.6 dBC average over a 24-hour period. No adverse impacts would be expected to public from small arms live fire.

4.7.2 Alternative 1

Under this alternative, the current level of activity and foreseeable future activities would be authorized. There would be no new activities or expenditures that have not already been described under the No Action Alternative. Noise levels would not be greater under this alternative and with the implementation of previously discussed mitigations (when applicable) noise impacts would not affect residential areas or the general public.

4.7.3 Alternative 2

This alternative would authorize the level of activity described in Alternative 1 plus an increase in mission activity. Increased mission activity translates to more frequent noise events, although the specific number of missions is not quantified in all cases. As these events are not expected to be occurring concurrently, the noise levels would not be greater than those described under the No Action Alternative. No adverse impacts are expected to residential areas or the public from noise under Alternative 2.

4.8 SAFETY AND RESTRICTED ACCESS

4.8.1 No Action Alternative

As outlined in Chapter 2, the No Action Alternative is the baseline of test and training activities as described under the Preferred Alternative of the *Santa Rosa Island Mission Utilization Plan PEA* (U.S. Air Force, 2005). The No Action Alternative does not quantify activity levels in terms of the overall number of expendables, but provides a description and qualitative discussion of each activity. Consequently, the following describes the current practices and methodology, and subsequent effects pertaining to the No Action Alternative.

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. These

SDZs 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 point of 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, 2002).

The methodology for footprint formulation combines munitions system science, computer modeling, and best management practices. These footprints include safety zones for initial impacts as well as ricochets. 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. Safety footprints are also employed for land-based training where live ordnance is used. Weapons safety footprints act as overlays that restrict activities that could normally occur within and adjacent to test areas (U.S. Air Force, 2002).

All ordnance would be handled by trained and qualified personnel in accordance with Air Force and Army explosive safety standards and detailed published technical data. If any unauthorized personnel or vehicles are detected within the area during training, all activity is temporarily halted until the area is again cleared and verified to be secure (U.S. Air Force, 2002).

Weapon safety footprints would be employed for land- and aircraft-based training where live or inert ordnance would be used. Standard safety procedures, such as closing the gates to the range and blocking all passable trails, would be implemented in all cases to ensure limited public access to affected areas during training activities. As a result, there are no safety concerns based on the levels of activity authorized by the 2005 SRI Mission Utilization Plan SRI Programmatic Environmental Assessment under the No Action Alternative (U.S. Air Force, 2005).

Unexploded Ordnance

For over 70 years the Eglin Range has been in use, and the location of impact areas and the SDZs have changed many times. Impact areas and SDZs are locations where ordnance might have been accidentally dropped long or short of their target or might have landed after ricocheting. In 2000, Congress dictated an inventory of land contaminated by UXO to gain an understanding of the UXO liability nationwide. The Eglin inventory classified 724 square miles as active range using two subcategories: current impact areas (50,000 acres) and historic impact areas (335,000 acres). Test areas, some cantonment areas on historic ranges (not UXO-contaminated but restricted due to the mission), and some interstitial areas are closed to the public due to high UXO risk (U.S. Air Force, 2001).

Eglin has strict safety policies and procedures in place to minimize the risk posed by UXO to personnel. For example, areas that may contain UXO have signs posted to warn of potential danger. Also, Eglin's Outdoor Recreation Map shows areas of probable and possible UXO contamination. Members of the public are required to receive UXO awareness training which includes a UXO recognition video, prior to being issued recreational permits to access the Range. No injuries to the public are known to have occurred at Eglin AFB as a result of UXO (Caldwell, 2008). However, UXO could potentially pose a danger to the people involved in training, as personnel must sometimes enter potentially hazardous test areas to set up targets or

instrumentation in support of test or training activities. However, other controls are in place for personnel involved in range management and/or engaged in missions on the range.

96 CES/CED manages the risks posed by UXOs on the Range. Equipment such as metal detectors, robots, and protective “bomb suits” are routinely employed to find and deal with potential UXOs. Once a potentially dangerous item is found, 96 CES/CED determines the best way to disarm it. The item may be removed to another location for disposal or it may be destroyed in place (a small amount of plastic explosive is placed next to the item and detonated from a safe distance). 96 CES/CED will then verify that no dangerous components from the item remain on the Range.

As the result of over 70 years of use, most areas on the Eglin Range, including SRI have the potential for UXO contamination. While a detailed records search of range use and potential UXO contamination on the Eglin Range has been accomplished by the USACE and a number of other studies have been completed, records of UXO contamination remain incomplete. Eglin has published a UXO Management Plan, which addresses historic use and contamination, current management practices, and future needs. A number of procedures are in place to minimize risks to Eglin personnel and members of the public who access the Eglin Range. To mitigate any potential adverse impacts from UXO, consultation and coordination with 96 CES/CED personnel would be required to address UXO on SRI. Therefore, there are no adverse affects to safety under the No Action Alternative.

4.8.2 Alternative 1

Under Alternative 1, the current level of testing and training activity has been established, including a quantity of expendables that includes foreseeable future activities.

Ordnance Use

Alternative 1 is based upon the current level of testing and training, as well as the current number of expendable ordnance. This ordnance differs in size and type, and includes 7.62-mm cartridges, Patriot missiles, smoke grenades, and lasers. A detailed list of every type of ordnance expended at SRI is in Table 2-2. In total, the maximum annual expendables under Alternative 1 are 799,291, although a number of munitions types would be inert. The same safety procedures would be used for Alternative 1 as those outlined in the No Action Alternative. Restriction of public access would be strictly enforced, and every effort would be made to ensure designated areas are clear of nonparticipating vehicles and personnel. The continued use of weapon safety footprints, or SDZs, would ensure the effects from testing or training activities remain in the designated areas (U.S. Air Force, 2002).

All ordnance would be handled by trained and qualified personnel in accordance with Air Force and Army explosive safety standards and detailed published technical data. If any unauthorized personnel or vehicles are detected within the area during training, all activity is temporarily halted until the area is again cleared and verified to be secure (U.S. Air Force, 2002).

Standard safety procedures, such as closing the gates to the range and blocking all passable trails, would be implemented in all cases to ensure limited public access to affected areas during

training activities. As a result, there are no safety concerns based on the levels of activity authorized by the Proposed Action under Alternative 1.

Unexploded Ordnance

Eglin has strict safety policies and procedures in place to minimize the risk posed by UXO to personnel, and based on the fact that during its history there have been no known injuries to the public, these policies are effective. Under Alternative 1, the same procedures as those discussed under the No Action Alternative would be utilized. Careful and meticulous adherence to established procedures, as well as strict accountability for all expended ordnance would ensure these safety practices remain effective and mitigate potentially adverse effects to safety under Alternative 1.

4.8.3 Alternative 2

Under Alternative 2, the current level of testing and training activity would be increased in the event that a surge in testing and training is warranted by situational events. Maintaining this surge capability ensures that the range is able to rapidly meet the needs of the customer, if necessary.

Ordnance Use

Under Alternative 2, the expendables from the training and testing conducted under Alternative 1 would be increased. This expendable ordnance differs in size and type, and includes 7.62mm cartridges, Patriot missiles, smoke grenades, and lasers. A detailed list of every type of ordnance expended at SRI is in Table 2-2. In total, the maximum annual expendables under Alternative 2 are 3,197,164. The same safety procedures would be used for Alternative 2 as those outlined in the No Action Alternative. Restriction of public access would be strictly enforced, and every effort would be made to ensure designated areas are clear of nonparticipating vehicles and personnel. The continued use of weapon safety footprints, or SDZs, would ensure the effects from testing or training activities remain in the designated areas (U.S. Air Force, 2002).

All ordnance would be handled by trained and qualified personnel in accordance with Air Force and Army explosive safety standards and detailed published technical data. An increase would also presumably increase the number of personnel, which would enhance the safety of the increased ordnance handling requirements. If any unauthorized personnel or vehicles are detected within the area during training, all activity is temporarily halted until the area is again cleared and verified to be secure (U.S. Air Force, 2002).

Standard safety procedures, such as closing the gates to the range and blocking all passable trails, would be implemented in all cases to ensure limited public access to affected areas during training activities. An increase would also presumably increase the number of personnel, which would allow for an increase in personnel available to ensure access remains restricted. As a result, there are no safety concerns based on the levels of activity authorized by the Proposed Action under Alternative 1.

Unexploded Ordnance

Eglin has strict safety policies and procedures in place to minimize the risk posed by UXO to personnel, and based on the fact that during its history there have been no known injuries to the public, these policies are effective. Under Alternative 2, the same procedures as those discussed under the No Action Alternative would be utilized. Careful and meticulous adherence to established procedures, as well as strict accountability for all expended ordnance would ensure these safety practices remain effective and mitigate potentially adverse effects to safety under Alternative 2. An increase would also presumably increase the number of personnel, which would enhance the ability to identify and properly dispose of unexploded ordnance on the range during this period of surge training and testing.

4.9 LAND USE AND RECREATION

There would be no changes to land use under any of the alternatives and therefore, land use would remain as described in Section 3.9. Recreational resources are evaluated to determine if any proposed project activity would affect a change in access, availability to a recreation site or activity, or a change in recreational opportunities.

4.9.1 No Action Alternative

Under the No Action Alternative, testing and training missions would remain at baseline levels as described in the Preferred Alternative of the *Santa Rosa Island Mission Utilization Plan PEA*. Under this alternative, areas of Eglin property along SRI that are open to the public and used for recreation could be temporary closed during military activities that could impact access, availability, and restrict certain recreational opportunities during the time of closure which could result in annoyance and nuisances. However, closures are anticipated to be temporary since they would last only for the duration of the activity. Closures are also anticipated to result in minor impacts since only a portion of the access would be restricted and other areas would remain open for public access and recreation.

4.9.2 Alternative 1

Under Alternative 1, an increase in testing and training missions would result in more frequent number of closures. Similar to the No Action Alternative, Eglin property along SRI that is open to the public for recreation could be closed or restricted access during testing and training missions. However, these closures are anticipated to be temporary and minor since closures would only last for the duration of the activity and many other areas are available for recreational use.

4.9.3 Alternative 2

Under Alternative 2, an increase in testing and training missions from current conditions would result in similar impacts as those described under Section 4.9.2, Alternative 1. Increased testing and training missions would result in more frequent number of closures. Similar to the No Action Alternative, Eglin property along SRI that is open to the public for recreation could be closed or restricted access during testing and training missions. However, these closures are

anticipated to be temporary and minor since closures would only last for the duration of the activity and many other areas are available for recreational use.

4.10 SOCIOECONOMIC RESOURCES

This section discusses potential impacts to socioeconomic resources, including environmental justice and special risks to children. The socioeconomic receptors include nearby communities, property, and activities that could be impacted by testing and training activities on SRI.

4.10.1 No Action Alternative

Under the No Action Alternative, testing and training missions would be conducted as described in the 2005 Preferred Alternative of the *Santa Rosa Island Mission Utilization Plan PEA*. There were no significant impacts identified in the 2005 Preferred Alternative of the PEA and therefore, there are no significant impacts identified under the No Action Alternative.

Fishing could be impacted from testing and training activities particularly if a surge in mission activities is performed during popular fishing events. To minimize any potential impacts, testing and training activities would be scheduled outside popular times and events including major tournaments and holidays. In addition, testing and training activities that would impact fishing would be performed only on weekdays and would not be performed on weekends which are the most popular times for recreational fisherman. Second, advisories and notices will be provided to the public prior to testing and training so that fisherman can avoid these particular areas.

Neither Okaloosa nor Santa Rosa County currently exceeds the state of Florida, or the community of comparison (COC) percentage of minority and low-income persons. The counties of Okaloosa and Santa Rosa have a higher percentage of children than the state of Florida which would indicate there could be a disproportionate impact to children. However, there are no school or childcare facilities on SRI and the closest schools and childcare centers are located inland within the Community of Fort Walton Beach. Fort Walton Beach has a lower percent youth population than the COC.

4.10.2 Alternative 1

Under Alternative 1, the number of expendables associated with mission activities is quantified. However, the change in the total annual number of testing and training missions is unknown. Testing and training missions are a vital component to the military which is a large economic driver in the area.

Impacts to socioeconomic resources are expected to be similar to those under the No Action Alternative. Fishing could be impacted, but mission activities would be scheduled outside popular times and events, including major tournaments and holidays. In addition, testing and training activities would be conducted only on weekdays. Advisories and notices would be provided to the public prior to testing and training so that fisherman can avoid these particular areas.

Neither Okaloosa nor Santa Rosa County currently exceeds the state of Florida, or the community of comparison (COC) percentage of minority and low-income persons. The Counties of Okaloosa and Santa Rosa have a higher percentage of children than the state of Florida which would indicate there could be a disproportionate impact to children. However, there are no school or childcare facilities on SRI and the closest schools and childcare centers are located inland within the Community of Fort Walton Beach. Fort Walton Beach has a lower percent youth population than the COC.

4.10.3 Alternative 2

Under Alternative 2, a potential surge in testing and training missions above baseline conditions would result in more frequent testing of current mission and activities above baseline levels. Potential impacts to socioeconomic resources would be similar to those as described under Alternative 1.

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APPENDIX A

MILITARY TESTING AND TRAINING AND OTHER LAND USE ACTIVITIES

SRI CURRENT MISSION AND LAND USE DESCRIPTIONS

Santa Rosa Island (SRI) provides a unique environment for military operations, affording access to diverse geographic features and the littoral zone. Local units that routinely utilize SRI include, but are not limited to, 7 Special Forces Group (Airborne) (7SFG(A)), HAVE ACE, 1 Special Operations Wing (1 SOW), 720 Special Tactics Group (STG), STTG, 6 Ranger Training Battalion (6RTB), 23 Special Tactics Squadron (STS), 14 Weapons Instructor Course (WIC), and 342 Training Squadron Detachment (TRS). Other units deployed temporarily to Eglin or Hurlburt also conduct missions at SRI. These units include US Army SF and Rangers, US Navy Special Boat Team (SBT) and Sea-Air-Land Teams (SEAL), US Air Force Combat Control Team (CCT) and Tactical Air Control Party (TACP), US Marine Corps Special Operations Forces (MARSOF), and allied foreign Special Operations Forces (SOF).

Missions of various types are conducted on SRI almost daily. All participating mission personnel abide by the rules and regulations for environmentally and culturally sensitive areas. The vast majority of missions are conducted in the area of A-15. This area has been under development for a number of years to support special operations mission sets. A-15 maintains a number of helicopter landing zones (HLZs) and buildings suitable for DA missions. For these reasons, and due to the restricted nature of SRI and A-15, it allows SOF personnel to train with multiple partnering forces and airborne assets in a secluded setting. Although A-15 is a primary area, A-7, A-10, A-11, and A-13 are also active training areas.

Many, but not all, missions conducted on SRI involve SOF personnel. The SOF battle plan involves the execution of small, quiet, stealthy, leave-no-trail operations. An ODA Team is usually a 12-person unit, with 1 or 2 additional personnel possibly present if being evaluated. There may be more than one team in place for a training mission, but even under such a scenario, the mission is not considered a major amphibious landing/attack training event involving hundreds of personnel. Training events consist of any number of specific tasks employing multiple means to accomplish them. Teams may arrive and depart SRI by multiple conveyances appropriate to the training task, including ground, air, and water transport. For shoreline operations, BLS areas as identified in this document are utilized for small boat operations to infil or exfil teams executing training events. Teams come ashore via small boat, and once on shore they proceed inland to conduct their mission. In most instances, during the infil and exfil phases, teams are on the beach area only long enough to prepare for the mission. During dive training events, teams conduct training up to 1,000 meters offshore in the Gulf of Mexico (GOM), and on the water's edge of the beach area. They may do multiple iterations of swimming/diving to and from the shore and the boat.

For air assault SOF missions, helicopters are utilized depending on availability and mission need. Personnel and equipment are delivered or extracted at an HLZ by either landing, or using an alternate system such as FRIES or fast ropes. Rope methods are used at HLZs, but also at other unimproved sites where the aircraft cannot land, or where speed of the mission dictates an expedient insertion or recovery. Insertion and extraction by vehicle is still the predominant method. Trucks, HUMVEE, bus, or car are all possible conveyances.

Once on shore/site, teams will maneuver on the ground to conduct DA, CSAR, or RECON type missions. Teams will incorporate information on culturally and environmentally sensitive areas, as provided by 96 CEG/CEV, when planning routes for ground maneuver actions to and from objective sites. An example would be inserting a team at A-13 that would then maneuver to A-15, conduct DA missions, then maneuver to A-17 for extraction. All maneuvers would take place through approved areas. The DA, RECON and CSAR missions involve small arms munitions in the form of blanks and simulators. In rare cases, live fire may be conducted. Also in use are ground burst simulators and small amounts of C-4/det cord required to dislodge doors from their frames. Specific structures are in place at A-15 to support these door breaching activities. Live rounds are not authorized on SRI.

Due to the ongoing training at A-15, and the sometimes immediate need for a specific event, the Gulf side of A-15 needs to be available on a near-continuous basis, without the need for regulatory consultation for each mission. A dedicated training area (shown as the A-15 Designated Training Area Area in Figure 2-2 of the main text) is part of Alternative 2 (the Preferred Alternative) for this REA and is described in Section 2.2.3. Based on size and scope of training, and with the support of 96CEG/CEV, monitoring and marking this area when required would allow all required events to take place without negative impacts to cultural or natural resources.

The following mission and land use descriptions provide information pertaining to activities that have been conducted within the SRI ROI. These activities are evaluated under the Preferred Alternative (Alternative 2) in Chapter 4. A terms and definitions section precedes the mission and land use sections.

A.1 Terms and Definitions

Combat Control Team (CCT). [JP 1-02, JP 3-17] (DoD) A small task organized team of Air Force parachute and combat diver qualified personnel trained and equipped to rapidly establish and control drop, landing, and extraction zone air traffic in austere or hostile conditions. They survey and establish terminal airheads as well as provide guidance to aircraft for airlift operations. They provide command and control, and conduct reconnaissance, surveillance, and survey assessments of potential objective airfields or assault zones. They also can perform limited weather observations and removal of obstacles or unexploded ordnance with demolitions.

Convoy Escort. [JP 1-02] (DoD, NATO) An aircraft in company with a convoy and responsible for its protection. Also, an escort to protect a convoy of vehicles from being scattered, destroyed, or captured

Beach Landing Site (BLS). [JP 1-02] (DoD) A geographic location selected for across-the-beach infiltration, exfiltration, or resupply operations.

Marine Corps Special Operations Forces (MARSOF). [JP 1-02, JP 3-05.1] (DoD) Those Active Component Marine Corps forces designated by the Secretary of Defense that are specifically organized, trained, and equipped to conduct and support special operations.

Personnel Recovery (PR). [JP 1-02] (DoD) The aggregation of military, civil, and political efforts to obtain the release or recovery of personnel from uncertain or hostile environments and denied areas whether they are captured, missing, or isolated. That includes US, allied, coalition, friendly military, or paramilitary, and others as designated by the National Command Authorities. PR is the umbrella term for operations that are focused on the task of recovering captured, missing, or isolated personnel from harm's way. PR includes, but is not limited to, theater search and rescue; combat search and rescue; search and rescue; survival, evasion, resistance, and escape; evasion and escape; and the coordination of negotiated as well as forcible recovery options. PR can occur through military action, action by nongovernmental organizations, other US Government-approved action, and/or diplomatic initiatives, or through any combination of these.

Rangers. [JP 1-02, JP 3-05.1] (DoD) US Army rapidly deployable airborne light infantry organized and trained to conduct highly complex joint direct action operations in coordination with or in support of other special operations units of all Services. Rangers also can execute direct action operations in support of conventional non-special operations missions conducted by a combatant commander and can operate as conventional light infantry when properly augmented with other elements of combined arms.

Sea-Air-Land (SEAL) Team. [JP 1-02, JP 3-05] (DoD) US Navy forces organized, trained, and equipped to conduct special operations in maritime, littoral, and riverine environments.

Search and Rescue (SAR). [JP 1-02] (DoD, NATO) The use of aircraft, surface craft, submarines, specialized rescue teams, and equipment to search for and rescue personnel in distress on land or at sea.

Special Boat Team (SBT). [JP 1-02, JP 3-05] (DoD) US Navy forces organized, trained, and equipped to conduct or support special operations with patrol boats or other combatant craft.

Special Forces (SF). [JP 1-02, JP 3-05] (DoD) US Army forces organized, trained, and equipped to conduct special operations with an emphasis on unconventional warfare capabilities.

Special Operations Forces (SOF). [JP 1-02, JP 3-05.1] (DoD) Those Active and Reserve Component forces of the Military Services designated by the Secretary of Defense and specifically organized, trained, and equipped to conduct and support special operations. Includes Special Operations personnel assigned to all branches of military service (Army, Navy, Air Force, and Marines).

Surveillance. [JP 1-02] (DoD, NATO) The systematic observation of aerospace, surface or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means

Tactical Air Control Party (TACP). [JP 1-02, JP 3-09.3] (DoD) A subordinate operational component of a tactical air control system designed to provide air liaison to land forces and for the control of aircraft.

Reconnaissance. [JP 1-02] (DoD, NATO) A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area.

FRIES: Fast rope infiltration/exfiltration/extraction system.

Duck Drop: Zodiac type boats dropped from fixed/rotary wing aircraft into a body of water.

Fast Rope Hoist: Extraction method employed by rotary wing aircraft. May be used anywhere personnel are on the ground and need to be removed.

Urban Escort: Specific form of convoy escort. Involves at least one airframe coordinating/conducting escort protection measures for a ground asset transiting an urban area.

Combat Search and Rescue (CSAR). Same as SAR, but in combat situation.

Ground Maneuver: Movement of personnel from one point to another, usually from an infil point to an objective area, and then out to an extraction point.

Infil/Exfil: Infiltration/Exfiltration by any means. Means can be on ground by vehicle, on water by boat or submarine, or by air with fixed or rotary wing asset.

Small Boat Ops: Means to deliver/remove personnel to an objective area. Can be in large open waters, and also up rivers and streams. Boat is usually a rubber zodiac type with small outboard engines. Engines are modified to be very quiet.

Dive Team: An ODA team whose specific task is scuba diving.

Direct Action (DA). [JP 1-02, JP 3-05] (DoD) Short-duration strikes and other small-scale offensive actions conducted as a special operation in hostile, denied, or politically sensitive environments and which employ specialized military capabilities to seize, destroy, capture, exploit, recover, or damage designated targets. Direct action differs from conventional offensive actions in the level of physical and political risk, operational techniques, and the degree of discriminate and precise use of force to achieve specific objectives. A DA mission involves the direct planning and maneuvering to engage an enemy target with force, neutralize the threat, then exit the area, or hold the area for reinforcements.

Operational Detachment Alpha (ODA) Team. A Special Forces unit consisting of 12 personnel trained on specific areas of warfare. There are mountain, dive, and HALO specialty teams. All teams are DA trained.

Operational Detachment Bravo (ODB) Team. A team whose job is to provide logistical support to an ODA team.

1 SOW: 1 Special Operations Wing

6 RTB: 6 Ranger Training Battalion

STTS: Special Tactics Training Squadron

23 STS: 23 Special Tactics Squadron

14 WIC: 14 Weapons Instructor Course

342 TRS DET 3: 342 Training Squadron Detachment 3 (TACP school at Hurlburt Field).

720 STG: 720 Special Tactics Group

HAVE ACE: USSOCOM special operations school at Hurlburt Field. Includes SOF personnel from all military service branches.

GOMEX: Gulf of Mexico

OPFOR: Opposing Forces

HLZ: Helicopter Landing Zone

A.2 MILITARY ACTIVITIES ON SANTA ROSA ISLAND

Testing

Air Operations Testing – Air operations that occur in the airspace above the SRI ROI are analyzed cumulatively within the *Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force, 1998). Air operations as part of the Open Air-Hardware in the Loop (OA-HITL) Tower Testing are included as part of this REA.

Electronic Countermeasures (ECM) and Electronic Systems Testing - ECM testing evaluates an aircraft system's ability to defeat land, sea, or airborne threats. This provides training on how to combat electronic signals designed to degrade onboard equipment or confuse the operator and any "other" use of the airspace. ECM Training is routinely done aircraft against aircraft or aircraft against ground/surface ship systems. Any part of the Eglin Range Complex can be used for this type of training but it is mostly done over the water. Electronic Systems testing includes radar software testing, radios, radar cross section, and any electronic system other than ECM. These missions are generally flown at a low speed and moderate altitude (usually 5,000 to 15,000 feet above ground level (AGL) but sometimes as low as 500 feet). SRI test facilities are usually involved in most of these activities.

Surface to Air (S/A) Missile Testing – Surface-to-air missile tests launch missiles from a variety of locations, including D-3 (Cape San Blas), TA A-15 on SRI, and surface vessels, at target aircraft in the Eglin Gulf Test and Training Range (EGTTR). Missions of this type typically involve Theater Missile Defense (TMD) medium- and long-range missile systems, such as Air Intercept Missile (AIM) and PATRIOT missiles, fired from a High Mobility Multi-Purpose

Wheeled Vehicle (HMMWV) at A-15. In 2002, an *Environmental Assessment for Projected Patriot Testing (Five-Year Plan)* (U.S. Air Force, 2002) was prepared to evaluate the potential impacts from conducting PATRIOT missile testing activities on SRI and interior portions of Eglin AFB over a 5-year period.

OA-HITL Testing – The cornerstone of the OA-HITL testing effort is a 300-foot OA-HITL tower at Test Area A-13B and three focus test sites located at TA A-3, TA A-6, and TA A-17A. The tower has a Skypod and Shaker Table to support test/test support equipment. The focus sites would contain a 100-foot tower, a control facility, and several pads/hardstands. OA-HITL testing involves linking the tower to other facilities such as the Guide Weapons Evaluation Facility (GWEF) or Preflight Integration of Munitions and Electronic Systems (PRIMES) facilities, allowing for complete simulations from aircraft release through endgame. The tower is also used as a seeker/sensor platform for evaluating or data gathering on new or improved seeker/sensors. The test item or subject could be as close as the beach, the surf zone, or as far as 30 miles out (line-of-sight) from the tower. The tower may also be used to test and evaluate Command, Control, Communications, Computers, Intelligence, and Surveillance/Reconnaissance Systems (C4ISR) systems through the same process of linking and simulations. This action was evaluated through the NEPA process in the *Environmental Assessment for Santa Rosa Island Reconstitution of Test Capabilities* (U.S. Air Force, 1998b). The 2005 SRI Mission Utilization Plan evaluated Expanded OA-HITL tower testing that included sensor testing with smoke and obscurants and the addition of a railroad track and turntable (U.S. Air Force, 2005).

Airborne Littoral Reconnaissance Technologies, Including Coastal Battlefield Reconnaissance Analysis and Rapid Overt Airborne Reconnaissance Systems – A Biological Assessment (U.S. Air Force, 2008) and corresponding Biological Opinion (NMFS, 2008) were completed in 2008 for Airborne Littoral Reconnaissance Technologies (ALRT) activities. The ALRT project consists of collecting signature data from both passive and active multispectral seeker/sensor signature data of obstacles, simulated mines, and barricades in inland environments and littoral waters from several possible systems and airframes. The sensors typically consist of passive multispectral receivers collecting imagery just as a video camera does, but some missions are active and have up to a Class IV laser illuminator. Simulated mines, barriers, and obstacles are set up on beach and inland areas, as well in as a separate specified marine area extending from the shore in waters as deep as 4 meters (13 feet) over an area 100 meters (328 feet) wide.

Under the ALRT program, the 46 TS/OGEE assists Naval Surface Warfare Center Panama City Division (NSWC PCD) execute the Coastal Battlefield Reconnaissance Analysis (COBRA) and the Rapid Overt Airborne Reconnaissance (ROAR). The COBRA flight test missions take place over multiple ranges. Decision of the specific range to use is based on the layout that will optimize data collection and provide accurate scoring effectiveness of each test. The primary range on SRI for COBRA operations is performed on A-15. NSWC PCD assets used for the setup of A-15 include inert mines, concertina wire, hedgehogs, sea urchins, tangle foot, buoys, and concrete blocks. The purpose of the test is to verify the COBRA system is fully operational through a series of flight tests over littoral and in-land environments. The ROAR system uses the same test methodology as the COBRA test except the ROAR system has an active imager while COBRA has a passive imager. The methodology encompasses both ground tests and flight

tests. Ground tests are performed by operating a truck on runways or on roads. The flight tests use a civilian Bell UH-1. Littoral environmental tests are conducted over A-15. When testing at A-15 is unavailable, tests are performed at the Navy Shallow Water Mines and Countermeasures (SWMCM) Test Ponds on B-70.

During each 1- to 2-week testing series, multiple data-collection flights are conducted, typically with two occurring per day. A Bell UH-1 “Huey” aircraft flies to Test Area A-15 to collect data. The aircraft then lands on TA A-15 to refuel, download data, check systems, and tie down for the night as required. The helicopter then takes off from Test Area A-15 for a subsequent data-collection flight, then returns to the mainland or stays on Test Area A-15 upon mission completion. Flights occur both day and night, with approximately 25 percent of missions occurring at night between the hours of 2100 and midnight. Altitudes range from 152 to 914 meters (500 to 3,000 feet) for each sortie, with typical speeds from 35 to 70 knots (40 to 81 miles per hour). Missions that do not require landing at Test Area A-15 stage out of local airports.

The typical system consists of the imaging sensor, optical illuminator image recording hardware, navigation tracking software, mechanical cooling equipment for the illuminator, and the aircraft. Lasers are enclosed in a light-tight enclosure with a mechanical shutter for stopping illumination when not over target fields. In addition, a number of laser safety devices are incorporated into the system to prevent inadvertent laser operation. Cameras record images of the target field. All recording is annotated electronically and synchronized together with Global Positioning System (GPS) time.

Each test series lasts 1 to 2 weeks. Personnel set up the target field over 3 to 4 days, the mission flights commence, and then personnel remove the targets from the test site over 2 to 3 days. ALRT missions could occur every few months; the estimate number of missions provided in the Biological Assessment for the Advanced ALRT Project (U.S. Air Force, 2008) is four to five times per year.

A typical mission scenario is as described below:

- Three to four days: target set up and mission preparation
- Four to six days: conduct mission flights
- Two to four days: weather backup
- Two to three days: target removal and cleanup

Activities associated with testing include placement of inert mines and obstacles (such as concrete blocks and concertina wire) on the beach front. M20 antitank mines, PDM-1M antitank/antiland craft mines, or other similar mines that are approximately 14 inches in diameter, plus baseplate accessories as required, are used in the surf zone at 0.5-meter (1.64-foot) depths. Barricades include concertina wire or wire rolls that could simulate concertina wire, tanglefoot barbed wire fencing, and structural sea urchins, which are three pieces of steel rebar welded in the shape of a teepee.

The minefield, barrier, and obstacle layouts required for this test include linear patterned and random scattered mines, barriers, and obstacles on the beach and in the water. These targets would be placed on the beach and in the surf zone. The obstacles and barricades would be no longer than 100 meters (328 feet); however, M20 inert antitank mines may be scattered around the other items but would be located within the potential placement locations. To minimize the movement or loss of mines, each individual target is anchored, tied together, inventoried, and monitored for proper setup. These devices are positioned near the edge of the water or in the water up to 4 meters (13 feet) deep and anchored primarily with screw anchors or, occasionally, poles jettied into the sand. To raise and lower some of the heavier targets, a boat/barge with equipment is necessary. A scuba diver secures each mine with a screw anchor.

The array remains in place at night, with reflective buoys marking the area to keep boat traffic out. As soon as the last flight test is complete, personnel remove all of the mines, obstacles, and barricades and account for their locations.

Small Boat Obscurant Testing – This type of testing led by the Navy involves using an obscurant system for small combatant watercraft. The Navy tests against certain operational scenarios, utilizing SRI beachfront as it has the instrumentation capabilities and test area requirements necessary to conduct these tests. This type of testing of infrared and obscurant screening along the beachfront is of interest to the Special Operations community and to the Army for beach assault or counterinsurgency tactics. The obscurant system uses standard Army smoke grenades to provide screening against visible and infrared threat systems. The grenades would be launched onshore and several hundred meters offshore. Sites designated for obscurant testing on SRI included A11, A13, A13A, and A15.

LCAC Training and Weapons Testing - The Landing Craft Air Cushion (LCAC) is a high-speed fully amphibious landing craft capable of traveling over both land and water, providing transition over the land-water interface. The LCAC is also used in the neutralization of beach obstacles and hostile watercraft, with testing/training activities typically involving live/inert testing of various firing mechanisms in concert with travel through the land-water interface and across beach environments. The 2005 SRI Mission Utilization Plan (U.S. Air Force, 2005) addressed Expanded LCAC Training/Maneuver Areas and designated specific LCAC crossover areas on SRI. Expanded LCAC activities involve the increased use of the LCAC for both inert training activities and live fire testing and training. Live fire activities consist of live 30 mm rounds fired at targets in the direction of the Gulf of Mexico. Live fire missions are uncommon and would be evaluated on a case-by-case basis through the Air Force 813 process. Under the 2005 plan, LCACs would utilize specific areas for crossing from the Gulf to Santa Rosa Sound and vice versa and for the use of firing weapon systems. The areas designated for LCAC crossovers in the 2005 SRI Mission Utilization Plan are located west of Test Area A-3, west of Test Area A-6, two areas between Test Area A-13A and A-15, and east of Test Area A-17. LCAC testing has not occurred on SRI since 2003, when a joint exercise between the U.S. Navy and the U.S. Marines was conducted and analyzed in the *Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) Readiness Training Environmental Assessment* (which includes the associated USFWS and NMFS Biological Assessments) (U.S. Air Force, 2003). The Preferred Alternative of this document would eliminate all LCAC crossover corridors except the one located near A-13B (Figure 2-2).

Ground Testing - Ground testing mainly involves land-based activities associated with supporting littoral warfare programs, which include shallow-water mine detection testing and mine obstruction clearance testing. Ground testing may also involve the setup and testing of equipment on the beach to evaluate performance in high humidity beach environments. Obscurants may also be used during ground testing. Such activities have been evaluated in the *Littoral Assessment of Mine Burial Signatures (LAMBS) Biological Assessment* (U.S. Air Force, 2002b), the *Environmental Assessment for Joint Biological Point Detection System (JBPDS) at Multiple Test Ranges* (U.S. Air Force, 2003a), and the *Biological Assessment for Airborne Littoral Reconnaissance Technologies (ALRT) Project* (U.S. Air Force, 2004).

JFPASS Technical Demonstration-1 - As part of the Technical Demonstration-1 (TD-1) Execution Concept, Team JFPASS performs several activities on Santa Rosa Island. The first activity performed on SRI by Team JFPASS includes deploying, setting up, and validating the integration and technical readiness of the Force Protection (FP) security system at A-17. The second activity performed by Team JFPASS on SRI includes training and practicing base defense operations. Tactical base defense operations are conducted in two phases. During Phase I, Team JFPASS provides radar and camera surveillance at site A-17 in a semi-fixed site/expeditionary operational environment. During Phase 2, Team JFPASS defends a portion of site A-17 in an austere expeditionary operational environment. The types of technology used during these two phase include: MIUW marine surface radar with camera; 3eTI Military Wi-Fi; STS-1400 Ground Surveillance Radar with Camera; MDARS Unmanned Ground Vehicle; Networked Remote Operated Weapon System (NROWS); BAIS intrusion sensors.

Pacific Sail Program - The SPAWAR Division of the Navy collects data on laser operations in a marine/littoral environment using test lasers (MATS system) and support equipment on A-15A in support for the Pacific Sail Program. Assets used include a laser backstop, target, and instrumentation set up on top of the 300 foot tower. The test team and equipment stay on the existing roads and hard surfaces at A-15A. Three laser lines illuminate a fixed target on the 300-foot island tower and airborne targets flying within W-151A over water and 2914A over the western Eglin Range. The laser lines used are 532 nm, 775 nm, and 1567 nm. Laser illumination is performed from ground to air. The testing period occurs over a 30-day period.

Joint Biological Standoff Detection System - The U.S. Air Force conducts Joint Biological Standoff Detection System production verification testing at SRI (A-15). Testing occurs over a 6-day period from 0000 to 1200. The JBSDS equipment uses Light Detection and Ranging (LIDAR) technology with infrared and ultraviolet lasers to detect and discriminate biological aerosol clouds up to 5 km away. The same systems used during previous testing will be used during this phase of testing. Simulants used during the test include: 150 grams (g) of bacterial spore agents (BG) and 5 L of BG wet; 16 L of viral agents (MS2); 240 g protein toxins (OV); 480 g of bacterium (Btk); 16 L plant pathogens (EH). The testing was evaluated in the *Environmental Assessment for Joint Biological Point Detection System (JBPDS) at Multiple test Ranges, Eglin Air Force Base, Florida* (U.S. Air Force, 2003a).

Simulants are disseminated to create an aerosol cloud using sprayers and blowers are released from a boat located off-shore out to a maximum distance of 5 km from the detectors. Interferents will be produced during the missions to test system performance in the presence of smoke. A

point source of smoke will be produced by burning brush/wood/hay/pine straw, and/or by using smoke grenades. Operating safety procedures will be IAW the test plan and the Eglin Test Directive Safety Appendix. All nonessential personnel are evacuated from the laser hazard area. Personnel inside the laser NOHD use approved laser protection goggles. Management requirements for turtle season are implemented to include restricting personnel from the beach, staying on established test sites, keeping lighting to a minimum, not shining lights toward the Gulf, and coordinating with Jackson Guard daily to ensure any turtle nests are identified and protected.

Tactical Radio Test Support - The RT-1944/U multiband network radio is designed to communicate high-volume sensor data from multiple Navy platforms to system operators to distant tactical ships including the LCS. The RT-1944 is under consideration as a replacement transceiver for the current AN/VRC-99B radio system. There are two purposes of the test. The first is to verify that the RT-1944/U meets the Capability Development Document (CDD) for Littoral Combat Ship Flight 0+ requirement to operate four off-board systems simultaneously. The second purpose is to verify the ability of the RT-1944/U to simultaneously pass such data from multiple MIW unmanned surface systems to a simulated LCS command station.

Test missions performed at SRI include a RT-1944/U base station and a radio network utility tester (R-NUT) located at previously improved ground or existing facilities at TA A-15 in order to simulate an LCS mounted base station. The radio antenna will be mounted on a 51-foot mobile tower located on an existing pad at TA A-15. The systems operating in the Gulf of Mexico will be one Common Unmanned Surface Vessel (CUSV), one Eglin AFB Rigid Hull Inflatable Boat (RHIB) acting as both a chase boat and as a simulated CUSV (test boat 3), two chartered fishing boats simulating Remote Multi-Mission Vessels (RMMV), and a Navy AeroStar UAV acting as a radio relay. The AeroStar UAV will take-off and land at TA B-12 with flights into W-151A1 airspace. The CUSV control station and an AeroStar UAV additional control station will be located in an existing blockhouse at A-15.

Littoral Combat Ship (LCS) Precision Attack Missile (PAM) Captive Seeker Flights - The Navy's LCS program includes 7 days of signature collection missions to support modeling and simulation development for the PAM. An Army UH-1 helicopter with a PAM seeker installed will be flying captive missions against a variety of manned surface vessels in the Gulf of Mexico. The Army UH-1 helicopter will operate out of Test Site A-15. UH-1 flights will initiate and end on A-15A Test Pad 1. The UH-1 will be stored in the High Bay (facility 12555) after each mission and be refueled by Eglin trucks daily while on the Test Pad 1. One of the mission days will also include a Navy SH-60 helicopter which will provide laser designation of the surface targets.

Training

Training missions or activities are designed to teach, maintain, or increase operational proficiency. Training is divided into categories, and in some cases levels within these categories. The major training categories occurring within the SRI ROI are described below.

Personnel/Equipment Drops and Extractions - Special Operations and the Army Ranger School routinely drop personnel and equipment into the water or on land either at low altitude (no

parachutes used) or high altitude (parachutes used). This activity typically uses W-151S (S = Shoreline) with occasional “over the horizon” drops in other sections of W-151 or any one of the numerous land drop zones or test areas. The typical drop is three to five personnel at a height of 5 to 2,000 feet above the surface. During certain operations, there will also be personnel helicopter extractions, which require short duration helicopter landings on SRI. Similar activities involving low-flying helicopters and personnel traversing the Gulf in small watercraft were assessed in the *ARG/MEU Readiness Training Environmental Assessment* (which includes the associated USFWS and NMFS Biological Assessments) (U.S. Air Force, 2003), *U.S. Army Ranger Los Banos Training Biological Assessment* (U.S. Air Force, 2003b), and *Advanced Skills Training Program Biological Assessment* (U.S. Air Force, 2003c).

Ground Training Operations - Ground training operations mainly fall under two categories: maneuvers and static training. Maneuvers involve many armed forces schools such as the Army Ranger Training Battalion School, Explosive Ordnance Disposal School, etc., which routinely deploy to most areas throughout the Eglin Range Complex for in-field training. Activities involve movements of troops and vehicles throughout the designated training area. SRI is used for beach assault training and other forms of clandestine operations using small-arms blank ammunitions. Similar activities have been evaluated under the ARG/MEU EA and USFWS consultation (U.S. Air Force, 2003). Additional activities involving Advanced Skills Training and Ranger Training have also recently undergone ESA Section 7 consultation with the USFWS (U.S. Air Force, 2003b and 2003c). Survival training routinely uses boats for water survival and parasail training.

Static ground training operations usually involve stationary exercises such as communication system training, bivouacking, or establishing a command center or triage. Similar activities were assessed in the *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force, 2003).

Live Fire – Live fire operations were addressed in the Estuarine and Riverine Areas Final Programmatic Environmental Assessment (U.S. Air Force, 2004a). Although analyzed, live fire activities currently are not conducted on SRI. Live fire operations would generally involve small-caliber weapons between 5.56-mm and .50-caliber fired in a seaward direction only. If available, soldiers would use frangible munitions with a 200-meter range or those of nonlead composition (i.e., tungsten) to reduce or eliminate potential environmental and safety concerns. Larger-caliber weapons such as the 30 mm could potentially be used on an intermittent basis, such as with LCAC operations on a mission-specific, case-by-case basis approved through the AFF 813 process.

The SRI live fire range would be a designated area a maximum of one mile in width extending from the Gulf side of SRI to the Sound side, and located near Test Site A-13B (Figure 2-1). This range would enable Special Operations Forces (SOF) to conduct hot insert/extraction and “break contact” training drills using boats and/or swimmers in a coastal beach environment. The frequency of use would be biweekly. Guards posted in bunkers flanking the east-west bounds of the range would call a cease-fire in the event of a boat or aircraft entering the firing fan.

Some live fire capability exists within the SRI and Santa Rosa Sound airspace. The airspace has an established controlled firing area, previously used during a live fire LCAC test. During this

test, an LCAC positioned in Santa Rosa Sound fired 30-mm rounds at targets on SRI and in the direction of the Gulf of Mexico.

The general mission requirements would include transit by boat to an approved live fire site, where trainees could engage in fixed or pop-up targets. The live fire engagement scenario would last approximately 30 minutes, while the actual firing duration would be on the order of two or three minutes, after which troops would move ashore to capture an objective. In addition to inflatable boats, larger boats such as the Mark 5 would also be potentially employed. The Mark 5 is 81 feet long and highly maneuverable and can achieve speeds of 51 knots. Mark 5 guns include either a GAU-19 or a GAU-13, similar to the gun that fired the 30 mm in a previous LCAC test mission. Rounds fired would potentially include 20 mm, 30 mm, 40 mm and small-caliber munitions from 5.56 mm to .50 cal. High explosive rounds would not be used; practice rounds would be employed.

Expanded Special Operations Training - Special Operations and U.S. Marines have a need to train for covert beach landings and assaults. These groups usually use five to 15 personnel with small rubber boats. They are dropped off approximately 15 miles from shore (over the horizon) to navigate in and make a covert landing and assault or capture a designated target on SRI. There are other Special Forces Units from around the country and units from foreign countries that also need this training. The U.S. Air Force Special Operations Command at Hurlburt serves as the host for such training. The Navy is also a user of SRI for special operations training exercises. Similar types of activities have been evaluated in the *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force, 2003). The 2005 SRI Mission Utilization Plan (U.S. Air Force, 2005) designated the majority of SRI for Expanded Special Ops Training. An area of SRI approximately 0.5 miles east of Test Area A-6 to approximately 1 mile west of Test Area A-3 was not included.

Amphibious Assaults – The Marine Corps uses SRI to perform amphibious assault exercises. These activities typically involve a coordinated mission utilizing large landing craft, such as AAVs and LCACs, varying numbers of troops and personnel, and aircraft for cover. Landing craft and personnel are “dropped off” several miles or several thousand yards offshore and traverse to the island. Upon reaching SRI, the assault force breaches the shoreline, sets up a perimeter or staging area, and either proceeds to an objective or remains on site. The *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force, 2003c) discusses these activities.

U.S. Army Rangers Los Banos Training – A biological assessment and corresponding biological opinion (U.S. Air Force, 2003b and U.S. Fish and Wildlife Service, 2003) was completed in 2003 to address U.S. Army Rangers Los Banos Training activities on SRI. As described in the Biological Assessment (U.S. Air Force, 2003b), the 6th Army Ranger Training Battalion (6 RTB) conducts Operation Los Banos Training on SRI approximately once per month, with a maximum of 24 days per year. The training is conducted on Friday nights, with instructors typically surveying the operation area and objective sites 1 to 2 days in advance of the mission. Each 6 RTB class consists of 2 to 6 platoons, with up to 46 people in each platoon. Therefore, a maximum of 276 troops may participate in each training exercise. All activities are located between Test Areas A-10 and A-18 and target specific objective sites (Figure A-1). The

operation can be divided into three main segments: Infiltrate (INFIL), Objective Assault, and Exfiltrate (EXFIL).

INFIL: Training exercises begin at approximately midnight. Rangers usually deploy from Wynnhaven Beach and paddle across Santa Rosa Sound to designated drop sites. Personnel then walk to the objective sites via corridors through the northern side of SRI. Movement may occur on roads, across cleared areas, and through dune environments. In some cases, Rangers may deploy from the western boundary of Eglin’s property and move to their objectives by vehicle or on foot.

Objective Assault: Small-scale assault training is conducted on objectives, using small arms blank ammunitions. The objective sites vary, but usually consist of small buildings. Personnel use the training to maintain and increase proficiency in weapons use.

EXFIL: When the assaults are complete, personnel consolidate and walk down the beach or road in wedge formation. Exit from the island occurs via helicopter or vehicle. Currently, helicopters are not being used due to potential damage caused by sand.



Figure A-1. Los Banos Training Sites

Advanced Skills Training – A biological assessment (U.S. Air Force, 2003c) and corresponding biological opinion (USFWS, 2004) were completed to address Advanced Skills Training (AST)

exercises on SRI. AST specializes in unconventional missions where troops assemble air navigation and communication sites. Deploying by air, land, or sea on missions within enemy territory, AST troops establish "assault zones" functioning as parachute drop zones, helicopter or fixed wing landing zones, or extraction zones for low altitude resupply missions. They establish "recovery zones," which are used for surface-to-air recovery of personnel or equipment, or ground-based fire control for fixed wing, rotary wing, and AC-130 gunships. AST exercises on SRI include INFIL/EXFIL, ground maneuvers, special tactics training events, and boat operations. AST events may occur a few days per week near A-15. A brief description of each is provided below:

INFIL/EXFIL: These events consist of a special tactics team being rapidly deployed (INFIL) into nearshore waters by helicopter or small boats (Zodiacs) and coming ashore. EXFIL of the area will be by helicopter or small boats. Special tactics teams are composed of up to 24 personnel per team (normal composition is 3 to 7 personnel). After INFIL, troops would come ashore across from A-13 and A-15 in Santa Rosa Sound via approved waterborne infiltration methods. INFIL from the Gulf (as opposed to Santa Rosa Sound) would occur no more than once per quarter (four times per year). When they reach the beach, personnel will carry the boats across the beach into the dunes and leave them for no more than 48 hours. Time on the beach would be a matter of minutes. These forces would move to a designated site (A-10, A-11, A-13, or A-15) on the island and perform Special Tactics Training Events (described in detail below) for up to 48 hours. The duration of the INFIL/EXFIL exercise is less than 1 hour and would occur up to 50 times per year.

Ground Movement: Ground movement involves the movement of wheeled vehicles and troops on foot from landing sites to objective areas, from objective area to objective area, and from objective areas back to landing sites. The majority of ground movement involves walking; however, wheeled vehicles such as all-terrain vehicles (ATVs), motorcycles, high mobility multipurpose wheeled vehicles (HMMWVs), and rescue all terrain transport (RATT) are used. Wheeled vehicle traffic is minimal and remains on established range roads. No vehicles are used on the beach or in the dunes. AST uses HMMWVs around landing zones (LZs) and drop zones (DZs) to set up support equipment. On SRI, Test Areas A-10, A-11, and A-13 are utilized to conduct ground movement operations. Ground movement operations generally last for 1 to 8 hours and could occur up to 365 days per year.

Boat Operations: Boat operations, Self Contained Underwater Breathing Apparatus (SCUBA) diving, and navigation training will be conducted in the Santa Rosa Sound across from Test Areas A-10, A-11, A-13, and A-15 via an administrative safety boat. The simulated training will maintain proficiency in approved waterborne infiltration methods, navigation, and procedures currently utilized by special tactics and special operation forces components. The AST organization will provide a safety boat and medical personnel. Personnel may deploy from a dock (north side of A-10) for missions in the sound. They will also traverse the sound from an amphibious infiltration to A-13 for ground ops (overland and bivouac ops). Once per quarter the waterborne ops will transition from the Gulf of Mexico to amphibious infiltration to the beach area followed by overland operations to conduct reconnaissance and surveillance (R&S) missions. Boat operations would occur for a duration of 1 to 48 hours with a maximum of

50 events occurring per year under the No Action Alternative. The number of boat operations could increase under Alternatives 1 and 2.

Special Tactics Training Events: Special tactics teams employ via overland methods to conduct R&S. R&S is a mission undertaken either to obtain, by visual observation or other detection methods, information about the activities and resources of an actual or potential enemy or to secure data concerning the meteorological, hydrographical, or geographical characteristics of a particular area. The special tactics teams establish an observation point and remain for up to 48 hours. R&S missions are clandestine in nature and no debris is left behind. During special tactics training events on SRI, SCUBA diving operations are conducted over a 2-day period once every 3 months at TA A-1. Diving consists of approximately 15-20 personnel entering the water from the beach, swimming out, and returning to the same location. The dives are conducted during either day or night. Small boats are used during these activities, but do not come ashore.

United States Army Special Forces Command Airborne Beach Assault/Combat Dive Qualification Operations – A Biological Assessment was prepared for these activities, which have occurred only once to date on SRI (June 2010). This training is also known as HAVE ACE. Phase I of the training consists of an open circuit SCUBA operation coming ashore at A-15 from the Gulf of Mexico. Three to four Zodiac boats depart from the Destin Coast Guard Station with no divers aboard. The boats enter the Gulf and travel to a point approximately due south of A-15, coming no closer than 1,500 meters from the shoreline. Upon arrival, a single boat approaches the beach and picks up four divers who are transferred to offshore boats to begin the exercise. The divers practice open water swimming techniques in deep water and then conduct a long swim exercise using SCUBA equipment. The objective is for each student to successfully come ashore at a designated spot on the beach at A-15. Instructors are present at all times during this phase of the training. The instructors would be in boats to ensure student safety and also onshore on the A-15 helicopter pad to ensure that students land and travel only in authorized areas. Support personnel on the boats have constant communication with support personnel on the shore through radio and have white light capabilities for use in emergency situations only.

During Phase II of the program, 24 trainees leave the Destin Coast Guard Station in three to four Zodiac boats and assault the beach at A-15. The boats land onshore and the students make their way inland and assault Building 12524, near the A-15 main building located 200 meters north of the beach. Once the assault is complete, the trainees return to the boats and exfil the island. Similar to Phase I, instructors are present during all portions of this exercise and are stationed as guides onshore at A-15.

The total amount of time spent on the beach is less than one hour for no more than 12 nights under Phase I and Phase II. Instructors perform all pre-staging and set-up activities for the area on the helicopter pad and the students are only on the beach for transition between the boats and the beach during infil and exfil of the island. No lights are utilized during these nighttime activities. All personnel use night vision goggles and an infrared strobe is used to mark the location on the beach where the boats should land. Support personnel have white lights available, but they are only used in emergency situations concerning the health and safety of the trainees.

Force Protection (FP) Demonstrations - The U.S. Air Force demonstrates a range of Force Protection (FP) tasks, including perimeter security surveillance and waterside security at A-17 during Joint Force Protection Advanced Security System IA-3/OD-1.

Close Quarters Battle Training – Close Quarters Battle training, also known as Close Quarters Combat training, is currently conducted at selected facilities and the immediately surrounding land at Test Area A-15 and Test Site A-11. Under the Preferred Alternative of this document, additional facilities and immediately surrounding land would also be utilized at Test Site A-13. Training activities include small arms blanks, small pyrotechnic devices, and small door breaching charges small explosive charges (maximum of 0.66 pounds net explosive weight [NEW]) used in and around buildings.

A.3 SURF ZONE TESTING/TRAINING IN ESTABLISHED SURF ZONE TESTING AREAS

Numerous surf zone testing/training activities occur or have occurred in the past at various locations on SRI. Major surf zone test exercises include neutral (inert) systems and, historically, live (containing explosive material) systems, which would be detonated underwater in shallow water. Testing of actual charges on SRI included surf zone test detonations of the Shallow Water Assault Breaching System (SABRE) shells, bombs for obstacle clearing, and LCAC line-charge systems. Small boat obscurant testing with smokes has also occurred within these areas. The Preferred Alternative in the 2005 SRI PEA (U.S. Air Force, 2005) designated specific surf zone testing/training areas at Test Areas A-15, A-10, and A-2. These areas were chosen based on their accessibility to the surf zone on the south side of SRI, the availability of power, water and some limited facilities, and surrounding land use constraints associated with a preliminary assessment of potential natural and cultural resources and IRP considerations. Specific examples of surf zone testing/training activities are as follows:

SABRE Mine Clearing Testing - The surf zone is the only place SABRE can adequately be tested, while crews train on proper weapon deployment. To accomplish these tests and training requirements, an LCAC pad or loading zone with roads and lights leading to it would typically be established, as well as an area where the LCAC can transient over SRI from the Gulf of Mexico to Santa Rosa Sound. Testing of the SABRE system involves launching of a line charge subsystem propelled by rocket motors. This could require closure of sections of Hwy 98 and some areas of the Gulf of Mexico and Choctawhatchee Bay waters to accommodate a 2.5-mile, 110-degree safety fan if these tests are conducted on the eastern portion of SRI. Recovery operations could also require a brief closing of Hwy 98. This test was evaluated and approved through the *Environmental Assessment for Coastal Testing of the Shallow Water Assault Breaching (SABRE) and Distributed Explosive Technology (DET) Systems* (U.S. Air Force, 1998c) and *Biological Assessment for Coastal Testing of the SABRE and DET Systems* (U.S. Air Force, 1998d) and received a Letter of Authorization for the Incidental Harassment of Marine Mammals from Surf Zone Testing Missions at Eglin AFB, FL (U.S. Air Force, 1998e). Only a portion of the test was completed, and future activities may involve this type of testing in areas other than those evaluated in the previous EA.

Beach Obstacle Clearing and Neutralization - These activities involve simultaneous multiple detonations of bombs in the surf zone. These will be evaluated to assess their effects on obstacles and mines as a potential beach-clearing tactic. These bombs would be set off simultaneously to evaluate their effects and potential for this type of application.

A.4 PUBLIC LAND USE

Eglin AFB controls 4,760 acres of SRI that includes a 4-mile strip of limited-access beach eastward of Fort Walton Beach, a restricted access 13-mile section extending to the west to Navarre Beach, Florida, and a small 0.25-mile section in between the two parcels at Test Area A-5. There are 2.5 miles of Okaloosa County controlled property between the two parcels of Eglin property. The public accesses the Gulf-side and sound-side beaches at multiple locations along the limited-access portion of SRI on the south and north sides of Highway 98 (Hwy 98). The public typically accesses the beach by parking on the shell easement along Hwy 98 and walking to identified access points. Authorized public recreation on the limited-access portion of SRI consists of fishing, swimming, sun bathing, and beach walking. Recreationalists are instructed to stay below the primary dune line. Some unauthorized recreation would include beach driving, sand dune sledding, night camping, and campfires. The area comprising the 4-mile strip east of Ft. Walton Beach is open to public access through identified access points. Range patrols occur when the beach area is closed due to mission activity. The beach is patrolled on a daily basis during peak seasons such as Spring Break, July Fourth, and other high-use holidays, and as often as possible during other times of the year. When range patrol is not present, there is the potential for the vandalism of government property and adverse impacts to natural resources including threatened and endangered species on the eastern portion of SRI from public access.

The portion of SRI controlled by Okaloosa County is composed of residential, public, and commercial areas. Marinas, hotels, condominiums, houses, parks, restaurants, bars/clubs, and shops are found throughout the county portion of SRI. The public uses these areas for recreational activities, and near-shore areas of the Gulf are used for boating and fishing.

A.5 REFERENCES

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APPENDIX B

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 Air Force instructions. 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 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 toxic release inventory requirements, emergency planning requirements, and release notifications requirements of 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 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 32-7045; 1-Apr-94; Environmental Compliance and Assessment; Implements AFPD 32-70 by providing for an annual internal self-evaluation and program management system to ensure compliance with federal, state, local, DoD, and Air Force environmental laws and regulations.

32 CFR 989; 1-Jul-01; Environmental Impact Analysis Process (EIAP); This regulation provides a framework for how the Air Force is to comply with NEPA and the CEQ regulations.

Air Force Instruction 32-7062; 1-Apr-94; 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, 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 Clean Air Act.

Air Force Instruction 32-7040; 9-May-94; 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.

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

FAC Chap. 62-204; Florida State Implementation Plan, with Ambient Air Quality Standards and PSD Program; Establishes state air quality standards and requirements for maintaining compliance with NAAQS.

FAC Chap. 62-213; Operation Permits for Major Sources of Air Pollution; Adopted Prevention of Significant Deterioration (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 (FAA); Created the FAA 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; Federal Aviation Regulation (SFAR No. 53); Defines and prescribes requirements for special use airspace.

14 CFR Part 91; 1997; Federal Aviation Regulation (FAR); Governs the operation of aircraft within the United States, 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 DOI and state, opens Air Force bases 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 (CZMA); 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 (FLPMA); Provides that the Sec. of Interior shall develop land use plans for public lands within 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 (CBRA); 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-Apr-94; 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; 31-Mar-94; 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 22-Jul-94; Integrated Natural Resources Management; Provides for development of an integrated natural resources management plan 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 (NCA); 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 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; 1-Mar-94; Air Installation Compatible Use Zone Program (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 (RHA); 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) (Water Pollution Prevention and Control Act, FWPCA); In addition to regulating navigable water quality, the CWA establishes NPDES permit program for discharge into surface waters and storm water control; 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; Federal Water Pollution Control Act/Clean Water Act (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); EPA-Requires the promulgation of drinking water standards, or MCLs, 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 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 (CERCLA); 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 United States 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; 03-31-79; 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 Clean Water Act, Safe Drinking Water Act, and Water Quality Act of 1987.

Air Force Instruction 32-7006 04-29-94; Environmental Program in Foreign Countries; Implements DoD Directive 6050.7.

Air Force Instruction 32-7041, Eglin AFB Supplement; 16 June 2010; Water Quality Compliance; Instructs the Air Force on maintaining compliance with the Clean Water Act; other federal, state, and local environmental regulations; and related DoD and Air Force water quality directives.

Air Force Instruction 32-7064; 22-Jul-94; Integrated Natural Resources Management; Sets forth requirements for addressing wetlands, floodplains and coastal and marine resources in an integrated natural resources management plan (INRMP) for each installation.

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

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

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

FAC Chap. 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 (BGEPA); 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 (MBTA); Makes it illegal to take, kill or possess migratory birds unless done so in accordance with regulations. An exemption may be obtained from the Dept. of the Interior for taking a listed migratory bird.

16 USC 1361 et seq.; 1997; Marine Mammal Protection Act of 1972, as amended (MMPA); 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; 22-Jul-94; 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 with the U.S. Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds.

DoD and USFWS Memorandum of Understanding (MOU); 2006; 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; Marine Mammal Protection Act of 1972, as amended (MMPA); 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; Endangered Species Act Interagency Cooperation; These rules prescribe how a federal agency is to interact with either the FWS or the NMFS 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 Endangered Species Act.

Air Force Instruction 32-7064; 22-Jul-94; 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 (OSHA); Requires that chemical hazard identification, information and training be available to employees using hazardous materials and institutes material safety data sheets (MSDS) which provide this information.

Department of Defense Instruction 6055.1; 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 Instructions 13-212v1 and v2; 1994; 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; 16-May-94; 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; 1-Mar-94; Air Installation Compatible Use Zone Program (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-96; 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 Order 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 (FIFRA); Establishes requirements for use of pesticides that may be relevant to activities at Eglin Air Force Base.

42 USC Sect. 2011 - Sect. 2259; Atomic Energy Act (AEA); 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 hazardous waste 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 (CERCLA); 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; Emergency Planning and Community Right-to-Know Act (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 Air Force Base (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 Force Instruction 32-7042, Eglin Air Force Base Supplement 1; 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 (FY) 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 (ISWMP) and the Qualified Recycling Program (QRP).

Air Force Instruction 32-7086, Supplement I; Hazardous Materials Management Plan; The Eglin AFB Hazardous Material Management Plan (HMMP) documents existing policy and procedures for organizations requesting, procuring, issuing, handling, storing and disposing of hazardous material (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, Emergency Planning and Community Right-to-Know Act, Pollution Prevention Act, Executive Order 12088, Executive Order 12777, and Executive Order 12586. Implements DoD Instruction 4120.14, DoD Directive 4210.15, and DoD Directive 5030.41.

Air Armament Center Instruction 32-7003; 15 August 2008 (currently in review); Hazardous Waste Management; This instruction is intended to provide a framework for complying with environmental standards applicable to Hazardous Waste (HW), Universal Waste (UW), Special Waste (SW) and used petroleum products on Eglin AFB.

Air Force Instruction 32-7020; 19-May-94; The Environmental Restoration Program; Introduces the basic structure and components of a cleanup program under the Defense Environmental Restoration Program. Sets forth cleanup program elements, key issues, key management topics, objectives, goals, and scope of the cleanup program.

Air Force Instruction 32-7042; 21-April-2009; Solid and Hazardous Waste Compliance; Provides that each installation must develop a hazardous waste (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 32-7080; 12-May-94; Pollution Prevention Program; Each installation is to develop a pollution prevention management plan that addresses ozone depleting chemicals; EPA 17 industrial toxics; hazardous and solid wastes; obtaining environmentally friendly products; energy conservation, and air and water.

Air Force Policy Directive 40-2; 8-Apr-93; Radioactive Materials; Establishes policy for control of radioactive materials, including those regulated by the US Nuclear Regulatory Commission (NRC), but excluding those used in nuclear weapons.

Cultural Resources

10 USC 2701 note, Public Law 103-139; 1997; Legacy Resource Management Program (LRMP); Provides funding to conduct inventories of all scientifically significant biological assets of Eglin AFB.

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 (HAS); 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 (AHPA); 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; Archaeological Resources Protection Act of 1979 (ARPA); Establishes permit requirements for archaeological investigations and ensures protection and preservation of archaeological sites on federal property.

16 USC 470 to 470w-6-16 USC 470f, 470h-2; 1997; National Historic Preservation Act (NHPA); Requires federal agencies to (1) allow the Advisory Council on Historic Preservation to comment before taking action on properties eligible for the National Register and (2) preserve such properties in accordance with statutory and regulatory provisions.

25 USC 3001 - 3013), (Public Law 101-601; 1997; Native American Graves Protection and Repatriation Act of 1991 (NAGPRA); federal agencies must obtain a permit under the Archeological Resources Protection Act before excavating Native American artifacts. Federal agencies must inventory and preserve such artifacts found on land within their stewardship.

42 USC 1996; American Indian Religious Freedom Act (AIRFA); federal agencies should do what they can to ensure that American Indians have 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; Protection of Archaeological Resources: Uniform Regulations; 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; Nominations to National Register of Historic Places; Details how the federal agency Preservation Officer is to nominate properties to the Advisory Council for consideration to be included on the National Register.

36 CFR Part 800; Protection of Historic and Cultural Properties; Sets out the Section 106 process for complying with Sections 106 and 110 of the NHPA: the Agency official, in consultation with the State Historic Preservation Officer (SHPO), identifies and evaluates affected historic properties for the Advisory Council.

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.

DoD Directive 4710.1; Archaeological and Historic Resources Management (AHRM); Establishes policy requirements for archaeological and cultural resource protection and management for all military lands and reservations.

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 National Historic Preservation Act, Executive Order 11593, and DoD Directive 470.1.

Air Force Instruction 32-7065; 13-Jun-94; Cultural Resource Management; Directs Air Force bases to prepare cultural resources management plans (CRMP) to comply with historic preservation requirements, Native American considerations; and archeological resource protection requirements, as part of the Base Comprehensive Plan.

Air Force Policy Letter; 4-Jan-82; Establishes Air Force policy to comply with historic preservation and other federal environmental laws and directives.

APPENDIX C
BIOLOGICAL RESOURCES

C.1 INFORMATION ON SENSITIVE SPECIES

Sea Turtles

In order to graphically display sea turtle nesting activity, the beachfront of SRI was divided into 0.5-mile survey zones, and nesting data were recorded by the zone in which they occur (Figure C-1). The color coding indicates nesting intensity for each zone by species. Numbers provided in the upper left corner of the figure indicate the total number of nests identified for a particular zone between 1998 and 2009.

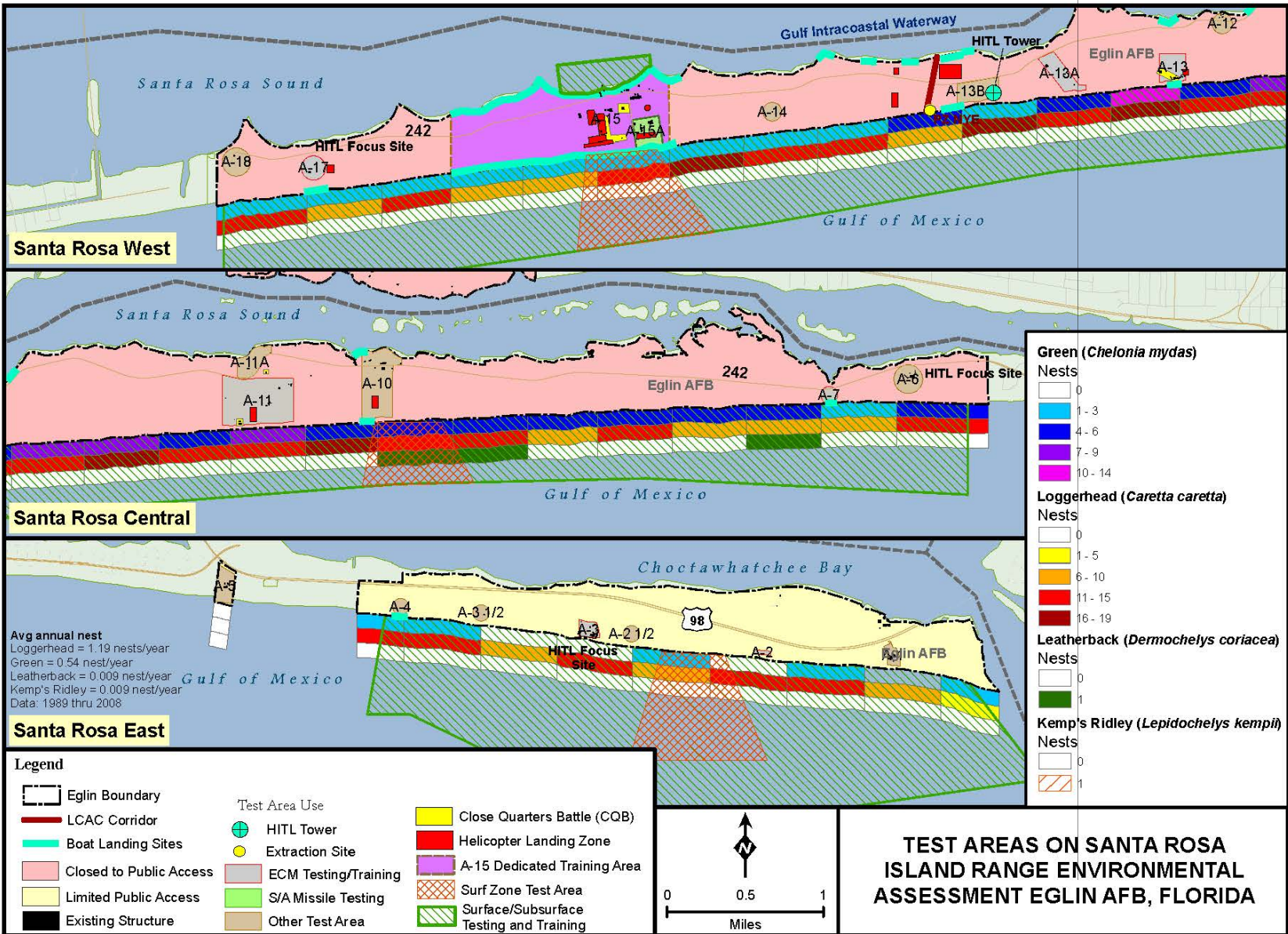
The sea turtle reproduction cycle on SRI has been divided into four time periods based on historical data (Table C-1). During the first time period, only nesting occurs. During the second time period, hatchlings emerge from previously laid nests while adult sea turtles continue to come ashore to lay new nests. During the third time period, adults have ceased to come ashore for nesting, while hatchlings continue emerging from existing nests. During the fourth time period, neither nesting nor hatching behavior is expected to occur. The earliest and latest possible dates for all species were selected to produce the combined species time periods.

Table C-1. Sea Turtle Nesting Periods by Species

Species	Nesting Only	Nesting and Hatching	Hatching Only	Off-Season
<i>Caretta caretta</i>	May 23 – Jul 24	Jul 25 – Aug 26	Aug 27 – Nov 5	Nov 6 – May 22
<i>Chelonia mydas</i>	May 20 – Jul 24	Jul 25 – Aug 22	Aug 23 – Oct 26	Oct 27 – May 19
<i>Dermochelys coriacea</i>	May 12 – Jun 19	N/A	Aug 5 – Sep 21	Sep 22 – May 11
Combined Species	May 12 – Jul 24	Jul 25 – Aug 26	Aug 27 – Nov 5	Nov 6 – May 11

Based on data collected between 1989 and 2008 on the 17 miles of Eglin SRI beaches, the average annual nesting density for loggerhead sea turtles (*Caretta caretta*) is approximately 1.19 nests per mile. During this period, 405 loggerhead nests were recorded. Peak loggerhead nesting on SRI occurs in June and July. Loggerhead hatching peaks in August and September. Slightly higher loggerhead nesting densities have been documented near TS A-2, between A-4 and A-3½, between TS A-9 and A-13B, and between TS A-15 and A-15A, with the highest densities between A-11 and A-12.

Eglin's SRI property supports the greatest number of Atlantic green sea turtle (*Chelonia mydas*) nests in northwest Florida. Green sea turtles have nested on SRI every other year from 1990 to 2002. However, in 2003 there were four green sea turtle nests, in 2004 there were none, in 2005 there were seven, six in 2006 and seven in 2007, possibly indicating a new trend. During this period, 120 green sea turtle nests were recorded. The average annual nesting density for green sea turtles is approximately 0.54 nests per mile. Peak green sea turtle nesting occurs in June and July, with hatching activity peaking in August and September. Most green sea turtle nests have been documented between TS A-7 and A-13B, with highest densities near A-13.



Leatherback sea turtle (*Dermochelys coriacea*) nesting has been documented only 1 year on Eglin SRI, during 2000. Three nests were laid in May and June and hatched in August and September. The three nests were located between TS A-7 and A-10. Additionally, in 2008, three Kemp's ridley sea turtle (*Lepidochelys kempii*) nests were recorded on SRI for the first time since recording began. Nesting has continued, with at least one nest occurring in 2010.

Atlantic Loggerhead Sea Turtle

The loggerhead sea turtle is federally and state listed as threatened. Loggerhead nests in Florida account for 90 percent of all loggerhead nesting in the U.S. From March through June, adult loggerheads congregate in the nearshore and offshore waters of the Gulf of Mexico to mate. Nesting sites are on the numerous barrier islands and beaches between the Florida Keys and the northern Gulf of Mexico. Nesting females approach SRI in the spring and summer to dig nests between the high tide mark and the dune line and, sometimes between dunes. Loggerheads are the most commonly seen sea turtles in the southeastern U.S. and may be found near underwater structures and reefs. Genetic research has identified five loggerhead nesting subpopulations in the western North Atlantic: 1) the Northern Subpopulation occurring from North Carolina south to around Cape Canaveral, Florida (about 29° N.); 2) South Florida Subpopulation occurring from about 29° N. on Florida's east coast to Sarasota on Florida's west coast; 3) Dry Tortugas, Florida, Subpopulation; 4) Florida Panhandle Subpopulation occurring at Eglin AFB and the beaches near Panama City; and 5) Yucatán Subpopulation occurring on the eastern Yucatán Peninsula, Mexico (NMFS and USFWS, 2007). These data indicate that gene flow between these four regions is very low. If nesting females are extirpated from one of these regions, regional dispersal would not be sufficient to replenish the depleted nesting subpopulation.

Atlantic Green Sea Turtle

The green sea turtle is listed as federally threatened in all its eastern range of North America, except in Florida where it is listed as endangered. In the U.S., it nests on southern Florida beaches with a few exceptions in areas of the northern Gulf of Mexico and North Carolina. In Florida's panhandle, the officially recognized nesting and hatching season for the green sea turtle extends from May 1 through October 31. Nesting in the panhandle historically occurs every other year event since 1990 with incubation periods ranging from 60 to 90 days. Eglin AFB SRI property supports the highest number of green sea turtle nests in northwest Florida.

Leatherback Sea Turtle

The leatherback sea turtle is federally and state listed as endangered. This species commonly nests along the shorelines of the Atlantic, Pacific, and Indian Oceans. Only infrequent nesting activity has been documented for the leatherback in northwest Florida. The officially recognized nesting and hatching season for the leatherback extends from March 1 through September 30, with nest incubation ranging from 60 to 75 days. Until the spring of 2000, the only confirmed leatherback nestings in northwest Florida were in Franklin and Gulf counties. In May and June 2000, leatherback nesting activity was documented for the first time in Okaloosa County on Eglin's portion of SRI.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle is federally listed as endangered throughout its range. Adults have the most restricted distribution of any sea turtle and are usually confined to the Gulf of Mexico, where postpelagic turtles may be found over crab-rich sandy or muddy bottoms. As hatchlings, the species presumably feeds on *Sargassum* (a floating seaweed) and associated small organisms. Adults feed mainly on crabs.

Hawksbill Sea Turtle

The hawksbill sea turtle is federally listed as endangered throughout its range. The hawksbill is a tropical species, generally occurring between 30° North and 30° South worldwide. This species is common off south Florida, where it is frequently associated with reefs and other outcrops, but may range into the northern Gulf of Mexico as well. The diet of adult turtles of Atlantic populations consists exclusively of sponges. Nesting has not been recorded on SRI.

Gulf Sturgeon

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) designated the Gulf sturgeon (*Acipenser oxyrinchus desotoi*) as threatened under the ESA. The state of Florida also considers the sturgeon a species of special concern.

The Gulf sturgeon is a large, cylindrical fish with an extended snout, vertical mouth, and chin barbells. The skin is scaleless and imbedded with five rows of bony plates or scutes. Adults range from 1.2 to 2.4 meters in length, with adult females generally larger than males. The Gulf sturgeon occurs predominately in the northeastern Gulf of Mexico, inhabiting offshore areas and inland bays during the winter months and moving into freshwater rivers during the spring to spawn. Migration into freshwater generally occurs from March to May, while migration into saltwater occurs from October through November. Spawning takes place during April through June in fresh water. Within the region of influence, sturgeons occur in the Yellow and Shoal Rivers in spring and summer, and in Choctawhatchee Bay, Santa Rosa Sound, and the Gulf of Mexico in winter.

Gulf Sturgeon Critical Habitat

Gulf sturgeon critical habitat was designated in 2003 and consists of 14 geographic areas. Designated water bodies near Eglin AFB include Choctawhatchee Bay, Santa Rosa Sound, Yellow River, Blackwater Bay, and East Bay. The lower river areas provide summer resting and migration habitat, and the bays and sound contain winter feeding and migration habitat. Gulf of Mexico habitat out to 1 nautical mile offshore is also designated as critical habitat.

Bottlenose Dolphin

The bottlenose dolphin (*Tursiops truncatus*) occurs in nearshore waters throughout the world. Bottlenose dolphins are distributed in a variety of habitats in tropical and temperate latitudes in waters ranging from 50 to 90°F (Fahrenheit). Two forms of this species have been identified: the coastal bottlenose dolphin and the offshore bottlenose dolphin. The former is found in bays,

estuaries, sounds, and coastal waters of the Atlantic and Gulf of Mexico, while the latter can be found in deeper, pelagic habitats. Some populations of bottlenose dolphins stay in one area for their entire lives while others migrate to many different areas. Bottlenose dolphins have gray bodies with a lighter, sometimes white, belly. They range in size from 2 to almost 4 meters, dependent on geographical location. Females sexually mature between 5 and 13 years, while males mature between 9 and 14 years. Calves are born every 3 to 6 years. The coastal form in the Gulf of Mexico is generally smaller than the offshore form.

Bottlenose dolphin abundance is estimated at 5,618 individuals for the Gulf of Mexico (Davis et al., 2000). The average herd or group size of Atlantic bottlenose dolphins in shelf and slope waters has been estimated at approximately 4 and 10 individuals per herd. Migratory patterns from inshore to offshore are likely associated with prey movements rather than a preference for a particular habitat characteristic (such as surface water temperature). The coastal form has a diet of bottom-dwelling fish and invertebrates, while the pelagic form consumes mesopelagic fish and squid. Sharks are the natural predators of bottlenose dolphins, and some specimens have been found with stingray spines in their bodies.

Bottlenose dolphins have a repertoire of vocalizations including clicks, whistles, echolocation clicks, and pulses. One particular vocalization, the signature whistle, distinguishes each individual of the population from one another. Bottlenose dolphins face a variety of pressures ranging from habitat degradation and vessel traffic to pollutant introductions and fisheries interactions

Atlantic Spotted Dolphin

The Atlantic spotted dolphin (*Stenella frontalis*) occurs in tropical and warm temperate waters of the Atlantic Ocean and Gulf of Mexico. Spotted dolphins are typically found in continental slope waters but occasionally come close to shore in pursuit of prey.

The adults of this species may be heavily spotted. The extent to which animals are spotted varies, sometimes geographically. For instance some Atlantic spotted dolphins in the Gulf have no spots, while species from coastal regions of the Atlantic may appear entirely white because of the numerous spots on their bodies. Females mature at 8 to 15 years and may continue to nurse calves at 5 years. Groups generally consist of no more than 50 individuals, but groups up to 100 animals have been recorded.

It is estimated that 3,213 Atlantic spotted dolphins may exist in Gulf waters (Davis et al., 2000). These dolphins are found in the Gulf over the shelf, and only bottlenose dolphins are sighted more often here than this species. The preferred depth of the spotted dolphin is believed to be associated with food availability and water temperature. Diet consists of small to large fish, cephalopods (squids), and invertebrates living in or on the ocean floor. Little data on abundance and mortality exists and documentation shows small numbers of animals taken in fisheries.

Piping Plover

The piping plover (*Charadrius melodus*) is state and federally listed as endangered. Piping plovers are found in winter foraging habitats as early as mid-July and leave by mid-May. This birds' primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (USFWS, 1996). Piping plovers are commonly documented during winter in the Florida panhandle with highest numbers of birds occurring in Franklin, Gulf, and Bay counties. Even though Florida has not been considered a primary wintering area for piping plover, diminishing habitat along other Gulf coast areas may be affording the piping plover new wintering grounds in Florida. These winter foraging grounds are still considered less suitable, thus forcing the piping plover to utilize isolated patches. As a result, critical habitat has been designated for piping plovers along the Gulf coast of Florida. Eglin's Natural Resources Section (96 CEG/CEVSN) conducts bimonthly shorebird surveys (including piping plover) from mid-July to mid-May on Eglin SRI property.

Piping Plover Critical Habitat

Winter foraging critical habitat for the piping plover was designated in 2001 (66 *Federal Register* 36038). Although only a small section of SRI has been designated as critical habitat (Figure 3-4), piping plovers may be found anywhere that affords proper foraging and sheltering resources. Piping plovers are known to forage in exposed wet sand areas such as wash zones, intertidal ocean beachfronts, wrack lines, washover passes, mud and sand flats, ephemeral ponds, and salt marshes. They are also known to use adjacent areas for sheltering in dunes, debris, and sparse vegetation. All of these habitat types can be found on Eglin's portion of SRI. Although it is possible that piping plovers could use any of these habitat types at any time during the winter foraging period, studies have shown that wintering plovers spend the majority of their time foraging for invertebrates found just below the surface of wet sand (Johnson and Baldassarre, 1988).

Santa Rosa Beach Mouse

The Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*) is one of five beach mouse subspecies and is the only subspecies not currently listed by either the state or the federal government. Santa Rosa beach mice are mostly nocturnal and burrow nests in dunes. They prefer sand-covered dune slopes with patches of grasses and herbs, and their diet consists of various plant seeds and insects. This population, which occurs only on SRI, was decimated after storm surge from Hurricane Opal in 1995 destroyed dune habitat. Eglin Natural Resources Section's track count surveys indicate an increase in population since 1995. Hurricane Ivan in 2004 also decimated a large percentage of dune habitats; however, beach mice are still present. Current threats to this population include feral cat predation and loss of dune habitat from recreational foot traffic and storms. Beginning in 2004, Eglin's Natural Resources Section increased survey frequency and began conducting monthly surveys to determine the severity of hurricane impacts. To supplement the monthly surveys, Eglin also began conducting tracking tube surveys every other month in 2010, in accordance with Florida FWC protocols.

Florida Perforate Reindeer Lichen

The Florida perforate reindeer lichen (*Cladonia perforata*) is state and federally listed as endangered. Extensive searches have shown this species to be extremely rare (only 12 documented sites in existence). Three of the known populations occur on Eglin AFB SRI property. In Florida, this species is mainly found in white sand scrub habitat dominated by sand pine rosemary and other scrub oaks such as sand live oak and myrtle oak. *C. perforata* usually occurs in open areas between patches of scrub vegetation. In addition to habitat loss, perforate reindeer lichen is also threatened by trampling, storm surges, and is susceptible to fires.

In 1995, Hurricane Opal destroyed two of the three populations on Eglin's SRI property and reduced the remaining population by more than 70 percent. This reduced population persists just east of the Destin pass. In June 2000, two reintroduction populations were established in the area of the previous populations, near Test Site A-10 on the north side of SRI. Eglin Natural Resources Section has installed fencing around the perimeter of suitable habitat. Monitoring data indicate that the introduced populations are stable with minimal dispersal.

Shorebirds and Wading Birds

Typical shorebirds and wading birds found on SRI include the snowy plover (*Charadrius alexandrinus*), state listed as threatened; little blue heron (*Egretta caerulea*), a state species of special concern; snowy egret (*Egretta thula*), a state species of special concern; black skimmer (*Rhynchops niger*), a state species of special concern; least tern (*Sterna antillarum*), state listed as threatened; tricolor heron (*Egretta tricolor*), a state species of special concern; and white ibis (*Eudocimus albus*), a state species of special concern.

Shorebird nesting season at SRI extends from March 15 through August 31. Prior to Hurricane Ivan, in an effort to protect nesting shorebirds, the area between the Beach Club and the Destin Pass jetties on SRI was closed to the public. However, impacts from Ivan dramatically reduced the large shorebird nesting habitat in this area and topographically created a direct pathway from the public access points to the Gulf of Mexico shoreline. There is a large historical shorebird nesting area near the location of the beach club prior to Hurricane Ivan. This area was greatly changed during the storm but the Air Force does not anticipate any negative impacts to nesting success. Eglin's Natural Resources Section (96 CEG/CEVSN) conducts bimonthly shorebird surveys from mid-July to mid-May on Eglin SRI property. Additionally, nesting surveys are conducted bimonthly from March to July. One nesting survey is done for least tern colonies mid to late May and one for black skimmer colonies in the first week of June.

96 CEG/CEVSN personnel have also conducted a snowy plover banding project on SRI over the past three years. This species has the potential to become federally listed in the near future. As a result of beach nourishment around Test Areas A-13 and A-13B, the USFWS requested that Eglin conduct snowy plover nest monitoring. During the breeding seasons, weekly surveys were conducted to find all snowy plover nests on Eglin's beaches. All nests found were recorded by GPS and monitored until hatching, when the chicks were banded (some unbanded adults were captured as well). During nesting surveys, the location of all observed banded birds was recorded. This data may be used to generate maps showing nesting and foraging locations of all banded birds. Hatchling survival rate may also be estimated. In addition to information

regarding the potential impacts of beach nourishment, additional species data were gained. Results show that some snowy plovers nest in the same location each year, while others use different locations in the same general area. Also, juveniles that have returned to their natal site typically do not breed until the second year. Nest site selection is highly variable among birds. Some birds nest on bare sand in flat areas in front of, between, or behind dunes. Others nest on top of dunes in grass, or in rocky areas. Banded birds were seen wintering as far west as Biloxi, Mississippi and as far south as central Florida.

C.2 INFORMATION ON INVASIVE NON-NATIVE SPECIES

Chinese Tallow

Eglin first identified Chinese tallow (*Sapium sebiferum*) colonization on SRI in 1996 during the assessment of impacts from Hurricane Opal. Chinese tallow is a small to medium sized tree that can take over large areas of natural habitat by forming thick dense stands and out-competing native vegetation. Chinese tallow spreads rapidly and dense stands can become established across open areas. Seeds are transported by birds or water, which makes dispersal difficult to control. Control efforts by hand removal (pulling seedlings) began in 1997–1998, but it was subsequently determined that herbicide treatments would be required.

Cogon Grass

On SRI, cogon grass (*Imperata cylindrica*) has been documented at multiple locations with most occurrences linked to test sites or road maintenance activities. Cogon grass is an upland weed, but also occurs in places that become briefly flooded. Because of its extreme invasiveness and ability to rapidly cover large areas, it is considered one of most impactful invasive plant species. Cogon grass has a fibrous root system composed of underground stems (rhizomes) that form dense mats that exclude most other vegetation. Cogon grass spreads by seeds, vegetative reproduction of rhizomes, and the movement of seeds/rhizomes by road maintenance/construction vehicles and activities. Control operations on SRI have been conducted since 1995 and continue as required.

Torpedo Grass

Torpedo grass (*Panicum repens*) has been found on SRI. This species is a perennial grass that frequently forms dense colonies and has long, creeping underground rhizomes. It thrives in moist, often sandy soil along beaches and dunes, margins of lagoons, marshy shorelines of lakes and ponds, drainage ditches and canals. However, it also does well in heavier upland soils. Its rhizomes often extend several feet out into the water, and the plant frequently forms dense floating mats. Where torpedo grass forms dense stands, it rapidly out-competes surrounding native vegetation. Herbicide treatments have not been conducted on this species.

Other Plant Species

There are additional invasive non-native plant species that have been found on SRI, but are not yet considered to be major problem species. Among those species are: lantana (*Lantana camara*), mimosa (*Albizia julibrissin*), purple sesban (*Sesbania punicea*), silverthorn (*Elaeagnus*

pungens), natal grass (*Rhynchelytrum repens*), Chinese wisteria (*Wisteria sinensis*), asparagus fern (*Asparagus densiflorus*), and alligator weed (*Alternanthera philoxeroides*). Eglin Natural Resources Section continues to closely monitor these species to ensure they do not spread, and treats them where necessary.

Feral Cats

Feral cats are major predators on native wildlife species. Over time, and with the assistance of humans, feral cats have become established on SRI. Feral cats hunt nesting shorebirds (least tern, black skimmer, and snowy plover), Santa Rosa beach mice, and other birds and wildlife. Feral cats have been documented to prey on sea turtle nestlings at other locations. Due to recent feral cat control efforts, population numbers appear to be stable on SRI, but will require continued control efforts to maintain or lower the current population.

Coyote

The coyote has expanded its range into the southeastern U.S. and the USFWS and the FWC consider the species non-native to Northwest Florida coastal areas. It competes with the native gray fox and the introduced red fox, and hybridizes with the red wolf now extirpated from Florida. The coyote's presence precludes future reintroduction of the endangered red wolf in these areas. Coyotes are especially problematic on the barrier island, where they prey on sea turtle nests and other sensitive species.

Red Fox

The red fox is an introduced species and the USFWS and FWC consider it to be non-native to the coastal areas of Northwest Florida. It competes with the native grey fox and other native species. As with the coyote, the red fox has been problematic on the barrier island where it preys on sea turtle nests and other sensitive species.

Fire Ants

Fire ants are found in open, disturbed areas, especially those that are wet. They are a threat to native wildlife populations, especially arthropods and reptiles, including their eggs. For instance, fire ants can infest sea turtle nests. Fire ant predation of sea turtle nests on Eglin's SRI property has not been documented. However, in previous years, Cape San Blas has experienced problems with fire ant depredation of sea turtle nests. There is no documentation on the impacts fire ants have had on other sensitive species on Eglin property.

Cactus Moth

A relatively new invasive species in the Florida panhandle, the cactus moth (*Cactoblastis cactorum*), has been found at the Guard Gate on SRI and is of concern because it predated on native cacti. The late instar caterpillars eat any prickly pear cactus with flat pads.

C.3 REFERENCES

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APPENDIX D

AIR QUALITY

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).

D.1 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 Clean Air Act (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 (Government Printing Office, no date).

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 Code of Federal Regulations [CFR] Part 51), except Florida has established a more conservative standard for sulfur dioxide (SO₂). USEPA has set the annual and 24-hour standards for SO₂ at 0.03 parts per million (ppm) (80 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) and 0.14 ppm (365 $\mu\text{g}/\text{m}^3$), respectively. Florida has adopted the more stringent annual and 24-hour standards of 0.02 ppm (60 $\mu\text{g}/\text{m}^3$) and 0.1 ppm (260 $\mu\text{g}/\text{m}^3$), respectively. In addition, Florida has adopted the national secondary standard of 0.50 ppm (1300 $\mu\text{g}/\text{m}^3$). Federal and state of Florida ambient air quality standards are presented in Table D-1 (Florida Administrative Code [FAC]).

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States 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 D-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 µg/m ³)
	1-hour(1)	35 ppm (40 mg/m ³)	No standard	35 ppm (40 µg/m ³)
Lead (Pb)	Quarterly	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)
Particulate Matter ≤10 Micrometers (PM ₁₀)	24-hour(2)	150 µg/m ³	150 µg/m ³	50 µg/m ³
Particulate Matter <2.5 Micrometers (PM _{2.5})	Annual(3)	15 µg/m ³	15 µg/m ³	150 µg/m ³
	24-hour(4)	35 µg/m ³	35 µg/m ³	15 µg/m ³
Ozone (O ₃)	1-hour(7)	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)	65 µg/m ³ 0.12 ppm
	8-hour(5)	0.075 ppm (2008 std)		(235 µg/m ³)
	8-hour(6)	0.08 ppm (1997 std) (157 µg/m ³)	0.08 ppm (157 µg/m ³)	
Sulfur Dioxide (SO ₂)	Annual	0.03 ppm (80 µg/m ³)	No standard	0.02 ppm (60 µg/m ³)
	24-hour(1)	0.14 ppm (365 µg/m ³)	No standard	0.10 ppm (260 µg/m ³)
	3-hour(1)	No standard	0.50 ppm (1300 µg/m ³)	0.50 ppm (1300 µg/m ³)

Source: USEPA, 2008 (Federal Standards); FAC 62-204.240, 2006 (Florida Standards)

ppm = parts per million; mg/m³ = milligrams per cubic meter; NAAQS = National Ambient Air Quality Standards;

µg/m³ = micrograms per cubic meter

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 µg/m³.
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 µg/m³ (effective 17 December 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 27 May 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 ≤ 1.
(b) As of 15 June 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 with the NAAQS. The air quality is monitored for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter 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.

D.2 PROJECT CALCULATIONS: AIR EMISSIONS

Regulatory Compliance Methodologies

Mission-generated air emissions were analyzed to enable comparison with NAAQS and to the cumulative impact to the air shed within the affected Region of Influence (ROI). Activities occurring within the Test Area (TA) B-70 range 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). 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 2002 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 (ASL), and the dimensional area within the SRI Range 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 the SRI range 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 1-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 1-hour emissions contributions were then compared with the appropriate NAAQS. For averaging times greater than 1 hour, the maximum concentration will generally be less than the calculated 1-hour value. The comparison is limited to those criteria pollutants directly associated with range activities.

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 SRI.

Vehicles associated with mission activities were classified into two categories, gas and diesel powered. This method of combining the USEPA's four vehicle classes into two has been previously used in the 2002 Eglin Mobile Source Emissions Inventory. 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's ranges were ascertained from the Road Range EBD published in 2003. The total road miles within SRI 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 SRI was a direct correlation with the vehicle miles traveled within SRI. 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 D-2 below contains the emission factors for each vehicle class.

$$\text{Emissions (tons/yr)} = (\text{RRM}/\text{TRRM}) \times \text{TAYVM} \times \text{EF} \times \text{CF}_1$$

$$\text{Emissions } (\mu\text{g}/\text{m}^3 \times \text{hr}) = (\text{RRM}/(\text{TRRM} \times \text{TV}) \times \text{TAYVM} \times \text{EF} \times \text{CF}_2$$

Where:

RRM = Range Road Miles (total miles for given range)

TRRM = Total Range Road Miles (Eglin's total range road miles)

TAYVM = Total Average Yearly Vehicle Miles traveled on Eglin'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 D-2. 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 Compounds

Vehicle Dust Emissions

When vehicles travel on unpaved roads, particulate matter (PM) is emitted into the air. In order to determine the amount of total suspended particulate matter (TSP) 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 0.001 percent due to Florida's very low material surface silt content (USEPA, 2003). 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, 2003).

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

$$E = k \times 5.9 \times (s/12) \times (S/30) \times (W/3)^{0.7} \times (w/4)^{0.5}$$

Where:

VMT = Vehicle Miles Traveled

E = emissions in (lbs)

k = particle size multiplier

s = silt content on road surface (%)

S = mean vehicle speed (mph)

W = mean vehicle weight (tons)

w = mean number of wheels per vehicle

D.3 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 2002 NEI data. Potential impacts to air quality are then identified 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 criteria approach is used in the General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas.

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 Air Force Base (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, and 2002 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.

- Carbon monoxide (CO)
- Nitrogen oxides (NO_x)
- SO₂
- Particulate matter (PM₁₀ and PM_{2.5})

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 (ETS/CEM) 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 (FHWA’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.

D.4 REFERENCES

Florida Department of Environmental Protection (FDEP), 1996. FAC 62-204.240 (1)(a-b). Ambient Air Quality Standards. March 1996.

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APPENDIX E

COASTAL ZONE MANAGEMENT ACT 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 Proposed Action associated with testing and training activities on Santa Rosa Island (SRI), Eglin Air Force Base (AFB), Florida as addressed in the SRI Range Environmental Assessment (REA).

Federal 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.

Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	<p>The Proposed Action would not affect beach and shore management, specifically as it pertains to:</p> <ul style="list-style-type: none"> • The Coastal Construction Permit Program. • The Coastal Construction Control Line (CCCL) Permit Program. • The Coastal Zone Protection Program. 	<p>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.</p>
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	<p>The Proposed Action, which occurs primarily on federal property, conforms to local government comprehensive development plans. Transitions from federal property into state waters primarily occur within restricted and prohibited areas controlled by the U.S. Air Force and would not interfere with development. Therefore, the Proposed Action would be consistent with local government comprehensive plans.</p>	<p>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.</p>
Chapter 186 <i>State and Regional Planning</i>	<p>State and regional agencies will be provided the opportunity to review the SRI Range Environmental Assessment (REA). Therefore the Proposed Action would be consistent with state plans for water use, land development, or transportation.</p>	<p>Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.</p>
Chapter 252 <i>Emergency Management</i>	<p>The Proposed Action would not affect the state's vulnerability to natural disasters.</p> <p>The Proposed Action would not affect emergency response and evacuation procedures.</p>	<p>Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.</p>
Chapter 253 <i>State Lands</i>	<p>The Proposed Action would involve the use of state submerged lands. An increase in testing and training missions would result in more frequent number of closures along SRI. However, closures are anticipated to be temporary since they would only last for the duration of the testing or training activity. Closures would likely result in minor impacts since only a portion of the access would be restricted whereas other areas would remain open for public access. Therefore the Proposed Action would be consistent with the state's administration of public lands.</p>	<p>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.</p>
Chapter 258 <i>State Parks and Preserves</i>	<p>The Proposed Action would not affect state parks, recreational areas and aquatic preserves.</p>	<p>Addresses administration and management of state parks and preserves.</p>

Statute	Consistency	Scope
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	The Proposed Action would not affect tourism and/or outdoor recreation.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.
Chapter 260 <i>Florida Greenways and Trails Act</i>	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.
Chapter 267 <i>Historical Resources</i>	<p>The entire project area has previously been surveyed for cultural resource presence/absence. Due to this comprehensive survey work, the locations of extant cultural resources are well known on SRI.</p> <p>Land-disturbing as well as sediment disturbing activities such as ground training, amphibious landing activities and surf zone testing would occur during certain mission and training activities. These activities all have the potential to adversely affect cultural resources. As a result of the potential to adversely affect cultural resources, coordination with 96 CEG/CEVSH would be required prior to any activities outside of currently approved test and training areas or above levels currently approved. Prior to any additional proposed activities, mitigative or protective measures may be required for known archaeological sites or historic structures.</p> <p>Ongoing activities require that National Register of Historic Places (NRHP) eligible resources are clearly marked and considered off limits and as a result would not be adversely affected. In the event of an inadvertent discovery, all training and testing will cease until Eglin’s Base Historic Preservation Officer and 96 CEG/CEVSH are notified and the area is further inspected.</p> <p>Therefore, the Proposed Action would be consistent with the State’s policies concerning historical resource management.</p>	Addresses management and preservation of the state’s archaeological and historical resources.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	The Proposed Action 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 <i>Transportation Administration</i>	The Proposed Action would not affect transportation.	Addresses the state’s policy concerning transportation administration.

Statute	Consistency	Scope
Chapter 339 <i>Transportation Finance and Planning</i>	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.
Chapter 373 <i>Water Resources</i>	<p>Impacts to water resources are discussed in Chapter 4 Section 4.3of the REA. An increased number of mission activities would not adversely impact surface waters, subsurface waters, wetlands, or floodplains, particularly with the implementation of management requirements listed in Chapter 2 Section 2.5 of the REA.</p> <p>Eglin Water Resources (96 CEG/CEVCE) would ensure that any applicable permitting requirements would be satisfied in accordance with Florida Administrative Code (FAC).</p> <p>Therefore, the Proposed Action would be consistent with Florida’s statutes and regulations regarding the water resources of the state.</p>	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 <i>Outdoor Recreation and Conservation Lands</i>	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 <i>Pollutant Discharge Prevention and Removal</i>	<p>Impacts from chemical materials and debris from testing and training activities are discussed in Chapter 4 Section 4.1.3 of the REA. Transport, storage, use, and disposal of hazardous materials and waste is coordinated with Eglin’s Environmental Compliance Branch, Pollution Prevention Section (96 CEG/CEVCP) and disposed of according to regulations and AAC Plan 32-5, <i>Hazardous Waste Management Plan</i>. AAC Plan 32-9, <i>Hazardous Materials Management</i>, describes Eglin AFB compliance with federal, state, Air Force, and DoD laws and instructions. All spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported.</p> <p>Under the Proposed Action, harmful levels of chemical materials would not occur due to an increased number of mission activities. Therefore, the Proposed Action would be</p>	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.

Statute	Consistency	Scope
	consistent with Florida's statutes and regulations regarding the transfer, storage, or transportation of pollutants.	
Chapter 377 <i>Energy Resources</i>	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.
Chapter 379 <i>Fish and Wildlife Conservation</i>	<p>Eglin Natural Resources Section (NRS) is preparing a Formal Biological Assessment for the Santa Rosa Island REA. This Section 7 Consultation will address impacts to threatened and endangered species regarding testing and training activities on Santa Rosa Island.</p> <p>All requirements resulting from the Formal Biological Assessment and resulting Biological Opinion would be followed, including the observation of appropriate habitat buffers and protected species surveys. Coordination with Eglin NRS prior to mission activities on Santa Rosa Island would be required.</p> <p>Therefore the Proposed Action would be consistent with the State's policies concerning the protection of wildlife.</p>	Addresses the management and protection of the state of Florida's wide diversity of fish and wildlife resources.
Chapter 380 <i>Land and Water Management</i>	The Proposed Action would not affect development of state lands with regional (i.e. more than one county) impacts. The Proposed Action would not include changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 <i>Public Health, General Provisions</i>	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 <i>Mosquito Control</i>	The Proposed Action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.
Chapter 403 <i>Environmental Control</i>	<p>Eglin Water Resources (96 CEG/CEVCE) would ensure that any applicable permitting requirements would be satisfied in accordance with Florida Administrative Code (FAC).</p> <p>The types of operations that occur on SRI use primarily small arms, smokes, flares, chaff, and some missiles. The majority of emissions would be from smokes/obscurants. These would cause a temporary and localized increase in particulate matter emissions. The types of munitions and the quantities used would not be</p>	Establishes public policy concerning environmental control in the state.

Statute	Consistency	Scope
	<p>sufficient to cause noticeable degradation to the regional air quality. There would be a minor and temporary increase in emissions during the use of obscurants or flares. Even with increased munitions use, emissions would not be substantial enough to cause levels to be greater than the National Ambient Air Quality Standards (NAAQS) or greater than 10 percent of the county’s baseline levels. Air emissions would have no adverse impacts on air quality from the Proposed Action.</p> <p>Transport, storage, use, and disposal of hazardous materials and waste is coordinated with Eglin’s Environmental Compliance Branch, Pollution Prevention Section (96 CEG/CEVCP) and disposed of according to regulations and AAC Plan 32-5, <i>Hazardous Waste Management Plan</i>. AAC Plan 32-9, <i>Hazardous Materials Management</i>, describes Eglin AFB compliance with federal, state, Air Force, and DoD laws and instructions. All spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported. Under the Proposed Action, harmful levels of chemical materials would not occur due to an increased number of mission activities.</p> <p>Therefore, the Proposed Action would be consistent with Florida’s statutes and regulations regarding water quality, air quality, pollution control, solid waste management, or other environmental control efforts.</p>	
<p>Chapter 582 <i>Soil and Water Conservation</i></p>	<p>Increased numbers of ground movements, LCAC operations, and surf zone testing would not adversely impact soil resources, particularly with the implementation of management actions. Impact minimization strategies and post-mission monitoring would likely be required for mission activities within the SRI ROI.</p> <p>Therefore, the Proposed Action would be consistent with the Florida’s statutes and regulations regarding soil and water conservation efforts.</p>	<p>Provides for the control and prevention of soil erosion.</p>

APPENDIX F
BIOLOGICAL ASSESSMENT

BIOLOGICAL ASSESSMENT



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 96TH AIR BASE WING (AFMC)
EGLIN AIR FORCE BASE FLORIDA

Mr. Stephen M. Seiber
Chief, Eglin Natural Resources
501 De Leon Street, Suite 101
Eglin AFB FL 32542-5133

SEP 30 2011

Dr. Donald Imm
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City FL 32405

Dear Dr. Imm:

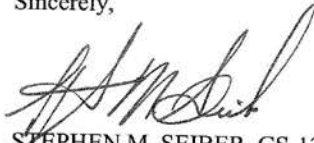
The attached formal programmatic biological assessment is being submitted to fulfill requirements under Section 7 of the Endangered Species Act (ESA). This Biological Assessment assesses potential impacts to nesting loggerhead, green, leatherback, and Kemp's ridley sea turtles; piping plover and piping plover designated critical habitat; and *Cladonia perforata* associated with various testing and training activities on Santa Rosa Island. Additionally the Santa Rosa beach mouse and shorebirds are considered.

The Proposed Action would authorize the current level of activity, including the associated number of expendables, plus an increase in testing and training activity to achieve an optimum usage level. Table 2-1 shows the maximum number of expendables under the Proposed Action. The proposed level of activity and performance of a comprehensive environmental analysis would ensure that the SRI ROI can support this level of activity without incurring significant environmental impact. This action authorizes an expected maximum level of activity, which facilitates responsiveness to the user group while ensuring that cumulative environmental effects do not cause significant impacts to biological resources.

The Proposed Action has varying potential impacts based on the scope of activities and relation to species and species habitat. Testing and training activities on Santa Rosa Island are **not likely to adversely affect** the piping plover or its designated critical habitat, *Cladonia perforata*, shorebirds, or the Santa Rosa beach mouse. Sea turtles are **likely to be adversely affected** by testing and training activities. Avoidance and minimization measures, to include clearance procedures prior to testing and training activities, would serve to reduce potential impacts to sea turtle nests, hatchlings, and adults.

If you have any questions regarding biological assessment or any of the proposed activities, please do not hesitate to contact either Mr. Bob Miller (850) 883-1153 or myself at (850) 882-8391.

Sincerely,



STEPHEN M. SEIBER, GS-13

Attachment:
Formal Programmatic Biological Assessment for Santa Rosa Island Testing and Training Activities

**EGLIN AIR FORCE BASE
FLORIDA**

**U.S. FISH AND WILDLIFE SERVICE
FORMAL ENDANGERED SPECIES ACT
SECTION 7 CONSULTATION
FOR
SANTA ROSA ISLAND
TESTING AND TRAINING ACTIVITIES
EGLIN AIR FORCE BASE, FLORIDA**



SEPTEMBER 2011

U.S. FISH AND WILDLIFE SERVICE

**PROGRAMMATIC BIOLOGICAL
ASSESSMENT**

FOR

SANTA ROSA ISLAND

TESTING AND TRAINING ACTIVITIES

EGLIN AIR FORCE BASE, FLORIDA

Submitted by:

Department of the Air Force
96 CEG/CEVSN
Natural Resources Section
501 DeLeon Street, Suite 101
Eglin AFB, FL 32542-5133

September 2011



PRINTED ON RECYCLED PAPER

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

1 SOW	1 Special Operations Wing
6RTB	6 Ranger Training Battalion
7SFG(A)	7 th Special Forces Group (Airborne)
AAV	Amphibious Assault Vehicle
AFB	Air Force Base
ATV	All Terrain Vehicle
BLS	Boat Landing Site
BRAC	Base Realignment and Closure
CCT	Combat Control Team
CQB	Close Quarters Battle
DPI	Direct Physical Impacts
ECM	Electronic Countermeasures
EGTTR	Eglin Gulf Testing and Training Range
EIS	Environmental Impact Statement
EOD	Explosive Ordnance School
ESA	Endangered Species Act
GOM	Gulf of Mexico
HLZ	Helicopter Landing Site
LCAC	Landing Craft Air Cushion
LCU	Landing Craft Utility
LED	Light-emitting Diode
MARSOF	Marine Corps Special Operations Forces
NMFS	National Marine Fisheries Service
NRS	Natural Resources Section
NSWC PCD	Naval Surface Warfare Center, Panama City
OA-HITL	Open Air Hardware in the Loop
OEIS	Overseas Environmental Impact Statement
PBA	Programmatic Biological Assessment
ROI	Region of Influence
S/A	Surface-to-Air
SBT	Special Boat Team
SEAL	Sea-Air-Land Teams
SOF	Special Operations Forces
SRI	Santa Rosa Island
STG	Special Tactics Group
STS	Special Tactics Squadron
TA	Test Area

TACP	Tactical Air Control Party
TP	Target Practice
TRS	Training Squadron Detachment
USFWS	U.S. Fish and Wildlife Service
WIC	Weapons Instructor Course

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1. INTRODUCTION

1.1 PURPOSE

This Programmatic Biological Assessment (PBA), developed by the Eglin Air Force Base (AFB) Natural Resources Section (NRS), is meant to fulfill the requirements of the federal Endangered Species Act (ESA) for assessing potential impacts to federally listed species. This consultation addresses testing and training activities associated with the Santa Rosa Island (SRI) Range Environmental Assessment on Eglin AFB. The previous consultation was submitted in March 2005 (FWS 4-P-05-242). This PBA assesses potential impacts to nesting loggerhead, green, leatherback, and Kemp's ridley sea turtles; piping plover and piping plover designated critical habitat; and Florida perforate lichen associated with various testing and training activities on Santa Rosa Island (Figure 1-1). Additionally the Santa Rosa beach mouse and shorebirds are considered.

1.2 PROPOSED ACTION

The Proposed Action is for the 46 TW to establish a new authorized level of activity for SRI that is based on an anticipated maximum usage level. Demonstrating that the individual and cumulative effects of this usage level would not have significant environmental impacts is the method for establishing the maximum threshold baseline. The environmental analysis is accomplished by evaluating the effects that the military testing and training activities and expendables have on Santa Rosa Island's environment.

1.3 NEED FOR THE PROPOSED ACTION

Eglin Natural Resources previously performed environmental analysis for testing and training activities on SRI in the 2005 *Santa Rosa Island Mission Utilization Plan Final Programmatic Environmental Assessment and associated Programmatic Biological Assessment* (U.S. Air Force, 2005). Since these ongoing testing and training activities were originally assessed, changes have occurred at Eglin AFB that could affect environmental analysis. The analysis in this assessment allows for a cumulative look at the impact on SRI from all testing and training activities. By implementing an authorized level of activity, Range management will be streamlined and cumulative environmental impacts will be more fully considered.

1-7

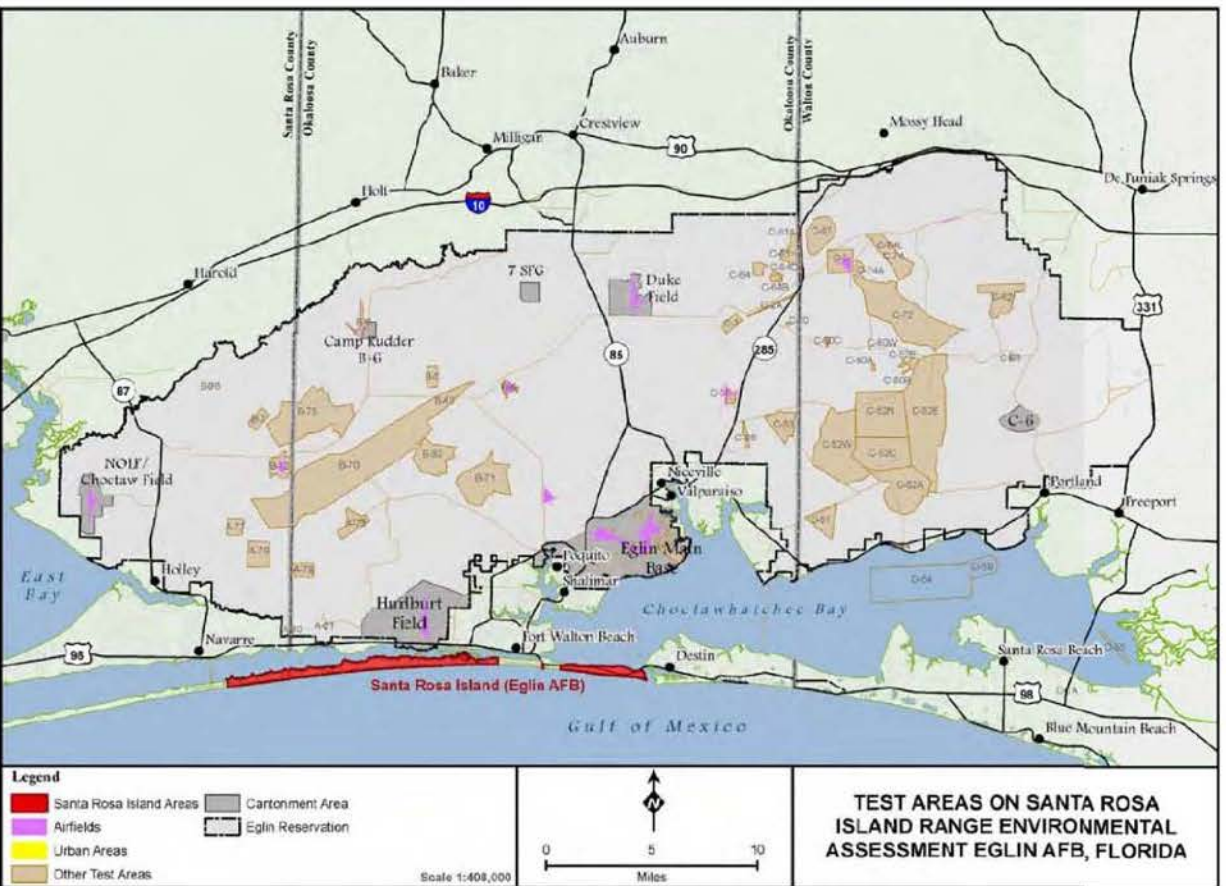


Figure 1-1. Santa Rosa Island Region of Influence

1-8

1.4 SCOPE OF THE PROPOSED ACTION

The region of influence (ROI) for this analysis is the landmass of SRI plus the Gulf-side shoreline to a depth of 30 feet (referred to as the “SRI surf zone”) (Figure 1-3). SRI provides a unique environment for military operations, including access to littoral areas. The variety of environments on SRI and Eglin AFB afford opportunities to train in diverse conditions. The opportunity to train within these types of areas was a key factor in selecting Eglin AFB as a suitable and desirable location for the 7th Special Forces Group (Airborne) (7SFG(A)) related to Base Realignment and Closure (BRAC) actions. Local units that routinely utilize SRI include, but are not limited to 7 SFG(A), HAVE ACE, 1 Special Operations Wing (1 SOW), 720 Special Tactics Group (STG), 6 Ranger Training Battalion (6RTB), 23 Special Tactics Squadron (STS), Weapons Instructor Course (WIC), and 342 Training Squadron Detachment (TRS). Other units deployed temporarily to Eglin or Hurlburt also conduct testing and training activities at SRI. These units include US Army Special Forces and Rangers, US Navy Special Boat Team (SBT) and Sea-Air-Land Teams (SEAL), US Air Force Combat Control Team (CCT) and Tactical Air Control Party (TACP), US Marine Corps Special Operations Forces (MARSOF), and allied foreign Special Operations Forces (SOF).

Current land use within the SRI ROI consists of military testing and training activities, natural and cultural resource management, and public use. Historical land use activities and locations typically used for these activities (as evidenced by past usage) are reflected in Figure 1-2. Military testing and training activity occurs across the length of Eglin-owned property and may generally be categorized as testing or training activities. The purpose of test events is to verify, validate, or demonstrate operational capabilities of new or upgraded hardware, software, aircraft, or weapons systems or the effectiveness of tactics. Training activities are designed to teach, maintain, or increase operational proficiency. Major types of testing and training missions are described in Chapter 2. Detailed mission and land use descriptions are provided in APPENDIX A.

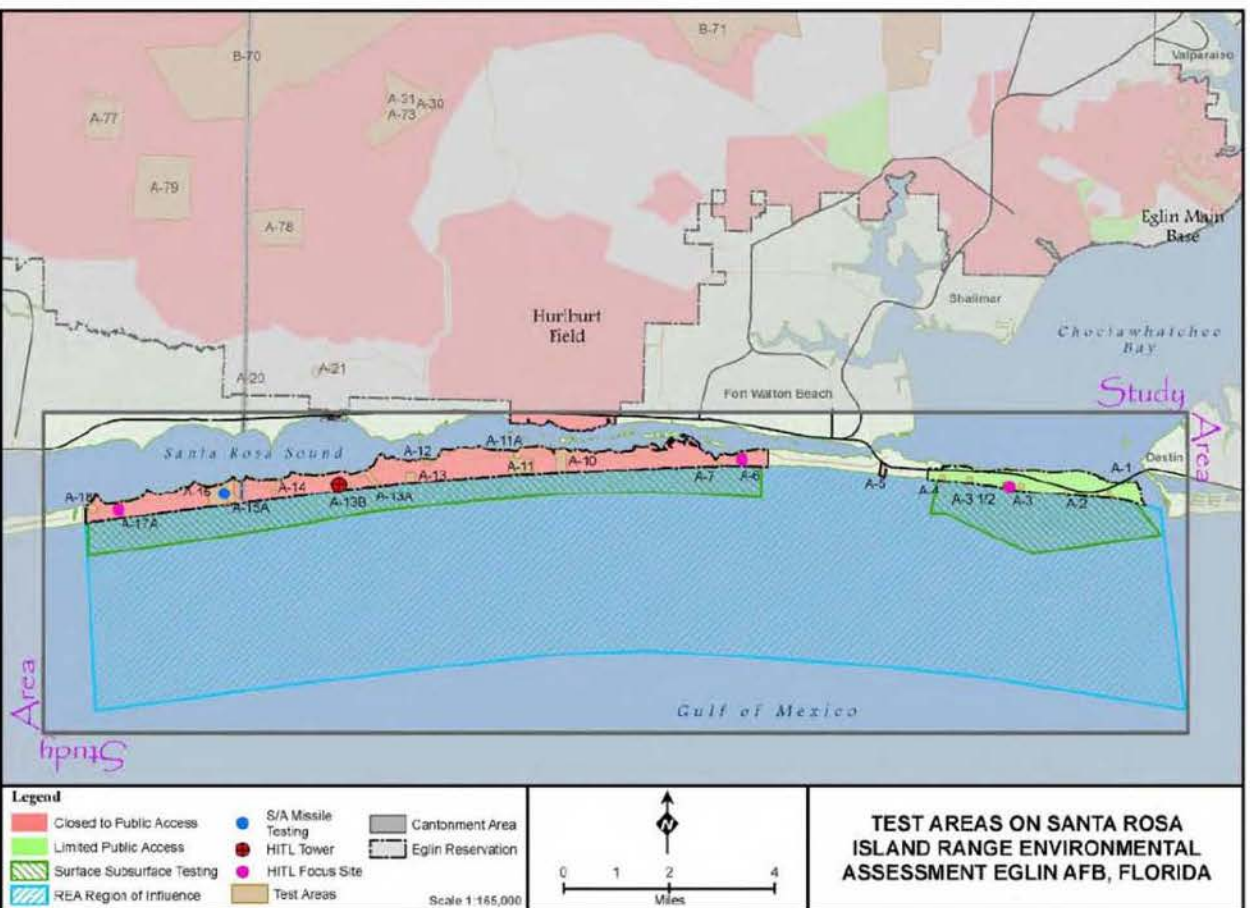


Figure 1-2. Testing and Training Areas within the Santa Rosa Island Region of Influence
1-10

2. DESCRIPTION OF PROPOSED ACTION

The Proposed Action would authorize the current level of activity, including the associated number of expendables, plus an increase in testing and training activity to achieve an optimum usage level. Table 2-1 shows the maximum number of expendables under the Proposed Action. The proposed level of activity and performance of a comprehensive environmental analysis would ensure that the SRI ROI can support this level of activity without incurring significant environmental impact. This action authorizes an expected maximum level of activity, which facilitates responsiveness to the user group while ensuring that cumulative environmental effects do not cause significant impacts to biological resources.

Table 2-1 Maximum Annual Expendables for SRI

Expendable Category	Expendable	Proposed Action
Artillery Simulator		2,100
Missile ¹		12
Drone ¹		12
Gun (inert)	30-mm	1,412
	7.62-mm	939,116
	5.56-mm	2,199,188
Grenades (smoke)		2,812
Explosive	Pentolite HE (per pound)	64
Flares		1,232
Chaff		1,924
Laser		24
Other	Blasting cap	648
	Blasting fuze	3,832
	Detonation cord	44,184

mm = millimeter; TP = training practice; HE = high explosive

1. Missile and drone expenditure information is not recorded in the Range Utilization Report (RUR) data but is available in other Eglin AFB documentation

2.1 MAJOR CATEGORIES OF TESTING AND TRAINING OPERATIONS ON SRI

- Surface-to-air missile testing. These activities involve missile launches from SRI or surface vessels, targeting aircraft in the EGTR. Typical missiles include PATRIOT, AMRAAM, and AIM.

2-1

- Electronic countermeasures and electronic systems testing. Electronic countermeasures (ECM) testing evaluates an aircraft system's ability to defeat threats and includes training on combating electronic signals. Training is mostly conducted over water ranges. Electronic systems testing include any electronic systems other than ECM, such as radar and radio. These test missions are flown at low-to-moderate altitudes and usually involve SRI test facilities.
- Open air hardware in the loop (OA-HITL) testing. The OA-HITL Tower at Test Area (TA) A-13B, as well as additional focus sites, is used to support these activities. The tower links to other facilities to provide advanced simulations in lieu of actual flight testing. The tower is also used to test and evaluate Command, Control, Communications, Computers, Intelligence, and Surveillance/Reconnaissance (C4ISR) systems.
- Ground testing and training. Some groups conduct ground testing and training exercises within the SRI ROI. Ground testing typically supports littoral warfare programs and may involve testing of equipment, obscurants, and biological aerosol simulants. Ground training activities may be categorized as maneuvers or static training. Maneuvers involve a variety of activities, such as the 6th Army Ranger Training Battalion's Los Banos Training, Advanced Skills Training, and HAVE ACE Special Operations. These activities may involve the use of small-arms blank ammunitions, live fire (using live rounds instead of blanks), smokes, or other expendables. Live fire events on SRI, though rare, may include use of small arms munitions (e.g., 5.56 mm rounds) as well as larger caliber rounds, such as the 30 mm. Live fire may occur only in designated areas with safety measures in place. Maneuvers may occur during the day or night. Static ground operations involve stationary exercises such as communication system training.
- Surf zone testing and training activities occur within the Gulf-side shallow water (30-foot maximum depth) environment of SRI. Such activities include mine- and obstacle-clearing training and landing craft air cushion (LCAC) operations. Some of these actions are currently authorized for the Naval Surface Warfare Center, Panama City (NSWC PCD) through other NEPA documents and regulatory consultations. Limited numbers of live detonations of less than 75 lbs and line charges consisting of a series of 5-lb charges totaling up to 1,750 lbs for use during mine and obstacle clearing have been approved [refer to the NSWC PCD Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) (U.S. Navy, 2009)]. Thus, that action for the Naval Surface Warfare Center is incorporated into this document by reference. **This document does not propose nor analyze additional live surf zone detonations or obstacles within the surf zone not currently covered by the ALRT Biological Assessment (FWS 2008-F-0056). Any other surf zone detonations would be required to undergo evaluation on a case-by-case basis through the AF 813 Environmental Impact Analysis process.** During LCAC training, 30-mm ammunition may be used at specific locations and

2-2

specific targets. Deviations from specific test and location parameters for LCAC training in this document would constitute a new activity, requiring separate environmental analysis through the Air Force Environmental Impact Analysis Process (EIAP). Other training missions involve shoreward and seaward movement of small craft and personnel through the surf zone. Scuba training is associated with some of the training, such as Advanced Skills Training.

- Laser use. A number of missions on SRI involve laser use. Lasers are used to detect obstacles, aircraft, and biological aerosol simulants.

2.2 CHANGES FROM BASELINE

Revisions to the baseline set of test and training activities within the SRI ROI (Figure 2-1) include reducing the number of LCAC crossover corridors, establishing a close quarters battle (CQB) training area, a dedicated training area (Figure 2-2), and increasing the number of designated boat landing sites and helicopter landing zones. LCAC missions have not been conducted on SRI since 2002, and none are currently planned. Most of the LCAC crossover corridors approved in the 2005 PEA would be eliminated, with one corridor remaining near Test Site A-13B.

2.2.1 Establishment of a Close Quarters Battle Training Area

Eglin AFB would establish a CQB training area and a dedicated training area. The CQB area would consist of facilities at Test Area A-15, Test Sites A-13, and A-11. Training activities include small arms blanks, small pyrotechnic devices, and small door breaching charges and small explosive charges (maximum of 0.66 pounds net explosive weight [NEW]), which would be used in and around existing buildings.

2.2.2 Additional Helicopter Landing Zones and Boat Landing Sites

A total of 16 boat landing sites (BLSs) would be designated on the sound- and Gulf-sides of SRI. This would include designation of 10 new sites in addition to 6 existing sites. A total of 14 helicopter landing zones (HLZ) would be designated, including 9 on unimproved surface and 5 on paved surface. BLSs and HLZs are used in a variety of missions (Figure 2-1).

2.2.3 Establishment of A-15 Designated Training Area

Due to the ongoing, active training at A-15, and the sometimes immediate need for a specific training event, a dedicated training area is needed almost continually. The Proposed Action includes the establishment of such an area at A-15 (Figure 2-2). The site boundary would coincide with the current ALRT Mission Area and expand to the east and west, while extending into the littoral zones of the Gulf of Mexico (GOM) and Santa Rosa Sound. The site would

2-3

support a variety of training activities (for SOF and possibly other groups) involving troop movement, boat and helicopter landings, and vehicle use in approved areas.

Although all efforts would be made to minimize environmental concerns at the designated A-15 training area, certain avoidance and minimization measures would still exist. Avoidance and minimization measures for this designated training area would include, but not necessarily be limited to, pre- and post-mission, test event, or training cycle protected species surveys, avoidance of shorebird nests and established dune habitat, and possible relocation of sea turtle nests. Avoidance areas would be marked as necessary by Eglin Natural Resource personnel. In the event that training activities at other test areas require transit to A-15, travel corridors would be physically delineated by personnel approved through Eglin Natural Resources Section to avoid impacts to natural resources.

2.3 TESTING AND TRAINING ACTIVITIES REQUIRING SEPARATE CONSULTATION

- Live surf zone detonations
- Nighttime missile launches
- Operations that require obstacles within the surf zone
- Use of additional HLZs or BLSs not shown on Figure 2-1
- Activities that must occur prior to morning sea turtle survey
- Use of designated Critical Habitat for the Piping Plover
- Use of *Cladonia perforata* areas

2.4 AVOIDANCE AND MINIMIZATION MEASURES TO BE IMPLEMENTED

This BA was prepared with consideration that the following avoidance and minimization measures (discussed below) would be employed for SRI training and testing mission activities as part of the Proposed Action. Operations occurring from March to October will typically have additional avoidance and minimization measures for shorebird nesting and sea turtle seasons. The time of year that user groups have the most operational flexibility is from 01 November to 01 March.

Proponents are responsible for ensuring the avoidance and minimization measures are implemented. If Eglin AFB (1) fails to assume and assure implementation of the avoidance and minimization measures or (2) fails to require the participants in the SRI activities to adhere to the avoidance and minimization measures through enforceable terms, the protective coverage of

2-4

section 7(o)(2) of the ESA may lapse, and may result in penalties, fines, and immediate operational shut-down of the test event or training on SRI.

2.4.1 Required Coordination for All SRI Testing/Training Activities

- Prior to first time operation or change of command for user group on SRI, mission personnel will:
 - Receive an NRS-approved environmental briefing
 - Review the SRI Environmental Guidebook
- Surveys will be required before and after test events or training operations that may affect protected species or sensitive habitat. Areas of known sea turtle or shorebird nesting will be avoided or an appropriate buffer must be posted, depending on mission activity.
- Test area A-15 and A-15A are to be used IAW EAFBI 13-212 Chapter 7, attachment 2. Units and activities approved for operations in this area will receive briefings as required for currency of appropriate rules and regulations. Routine, repeat missions operating from A-15 Pad 1 and A-15A Pad 1 north to Santa Rosa Sound will be conducted IAW approved environmental guidelines and scheduled in CSE. Any operations south of A-15 Pad 1 and A-15A Pad 1 to the Gulf of Mexico require NRS coordination.

2.4.2 Prohibited Areas for All SRI Testing/Training Activities

- Piping plover designated critical habitat and *Cladonia* habitat sites
- Vegetated dune habitat and dunes higher than 5 feet
- Posted areas of sea turtle nests and shorebird nests

2.4.3 Avoidance and Minimization Measures for Vehicle Use

- Unapproved off-road driving is prohibited. All off-road driving must receive prior written approval from the NRS each time the test event or training cycle occurs.
- Vehicles and equipment are not allowed in vegetated dune habitat due to the potential for vegetation damage and subsequent wind and storm erosion.
- Unapproved beach driving is prohibited. All beach driving must receive prior written approval from the NRS each time the test event or training cycle occurs.
- For approved beachfront driving, vehicle operators will be instructed to:
 - Remain alert at all times to the potential presence of sea turtles and shorebirds on the beach.

2-5

- Traverse the beachfront as close to the waterline as possible and below the MHWL (mean high waterline) when possible.
- Remain at least 50 feet away from marked sea turtle nests and 50 feet below the primary dune line.
- Vehicle/equipment access would be restricted in untreated areas with known invasive plant problems.
- To prevent invasive species on SRI, vehicles/equipment should be washed before transport onto the island.

2.4.4 Avoidance and Minimization Measures for Amphibious Landing and LCAC Movement Corridor

- The size of movement corridors would be limited to the minimum necessary for the mission.
- Landing and movement corridors would be marked so as to be easily distinguished by the operators of amphibious landing vehicles/watercrafts.
- Use of boats at night would be minimized when possible during sea turtle nesting season, especially during the peak nesting season (June and July).
- LCACs would avoid vegetated areas to the greatest extent practical and would vary their paths within the designated crossover corridor at A-13B.
- During sea turtle season:
 - In areas where LCAC amphibious landings (A-13B 0.5 mile corridor) would be conducted between 01 May and 31 October, Eglin Natural Resources Section must be notified at least 80 days prior to the action in order to relocate nests in that area. All nests within the A-13B landing corridor will be relocated at least 50 feet from the area.
 - Amphibious Assault Vehicle (AAV) and LCAC use within maneuver areas would be restricted to daylight hours.
 - LCAC and AAV maneuver/training activities would preferentially occur at areas from which sea turtle nests have been relocated or where no nests occur. Coordination with Natural Resources would be necessary to ensure that no nests are located within the maneuver area prior to AAV/LCAC use.
 - *Sargassum* mats in Gulf would be avoided.

2-6

2.4.5 Avoidance and Minimization Measures for Surface-to-Air Missile Testing

- No nighttime test events would occur during sea turtle season (01 May through 31 October).
- Missile launches requiring nighttime setup would avoid sea turtle season if possible.
- Prior to setup, Eglin Natural Resources approved personnel would conduct a pre-mission survey of the area. Sea turtle nests and shorebird nests would be marked and avoided.
- Eglin Natural Resource approved personnel would be present during setup and test event during sea turtle nesting season for daytime or nighttime activities.
- Sea turtle nests would be marked, and any hatchlings disoriented by setup activities would be redirected toward the shoreline by Eglin NRS approved personnel. Only persons on Eglin's sea turtle permit would be allowed to interact with sea turtle adults or hatchlings. Persons not included on the permit who encounter a sea turtle would contact Eglin NRS.

2.4.6 Avoidance and Minimization Measures for Munitions and Pyrotechnics Use

- Use of inert or target practice (TP) rounds of ordnance should always be considered.
- Frangible or non-lead munitions would be used when possible.
- Live fire is restricted to designated areas (Figure 2-1). Blank ammunition use and pyrotechnics are permitted in designated areas.
- Live fire activities at night during the peak sea turtle season (June, July, August, and September) must occur at areas where nests have been relocated (i.e. A-15 Designated Training Area) or where no nests occur.
- Live fire activities would avoid marked sea turtle nests by at least 200 ft.
- Live fire would be directed toward the Gulf and away from piping plover designated critical habitat.
- Live fire buffer zones around known piping plover designated critical habitat would be established (i.e. 150 meters for frangible munitions, 2,000 meters for standard munitions).
- Coordinate planned use of explosives or powerful munitions with Eglin Natural Resources Section.
- Follow regulations on small arms blank ammunition, debris and hazardous materials for cleanup. Spent cartridges would be collected for recycling. User groups are responsible for cleanup of debris and hazardous materials within 48 hours after test event or training cycle ends. Cleanup of debris is mandatory (as described in individual test directives).

2-7

2.4.7 Additional Avoidance and Minimization Measures for Beachfront Activities during Sea Turtle Season

In addition to the general avoidance and minimization measures above that apply to all SRI testing and training activities; there are also additional seasonal avoidance and minimization measures that apply from **01 May to 31 October** for test events, training cycles, and set-up activities on the beach:

- Beachfront activities will be concentrated at the A-15 Designated Training Area whenever possible.
- Operational activities would remain on concrete or asphalt hardstand areas when possible.
- Nighttime amphibious and land-based activities on the beachfront will be minimized when possible during sea turtle season.
- Testing or training missions would use established HLZs and BLSs. From 01 May to 31 October, if surveys indicated a sea turtle nest within 200 feet of the HLZ or within 50 ft of a BLS, another HLZ or BLS would be used for that mission.
- No daytime (sunrise to sunset) testing or training beachfront activities may begin before completion of daily sea turtle nest survey and protection measures (nest marking or relocation).
- Personnel, vehicles, and equipment operations would avoid marked sea turtle nests by at least 50 feet.
- Fighting holes, trench systems, vehicle or equipment traps, artillery bunkers, etc., must be refilled and leveled after the activity is finished.
- During sea turtle hatching season (01 July to 31 October), all ruts, holes or disturbed areas deeper than 2 inches and 2 feet or larger in diameter must be removed prior to sunset. All such ruts created during night operations must be removed immediately following operation completion.

Nighttime Beachfront Activities from 01 May to 31 October

- A one-time nesting survey must be conducted by personnel approved by Eglin Natural Resources 2 hours prior to the start of the activity on the portion of the beach where the activity would occur. All nests located during surveys at night must be marked and protected (or relocated where approved) before the nighttime activity begins.

2-8

- An observer approved by Eglin Natural Resources must be present to identify signs of nesting or hatchling sea turtles. The observer will be responsible for ensuring that the training participants do not interfere with nesting sea turtles, impede hatchling sea turtles from emerging from the nest and crawling to the Gulf of Mexico, or obscure signs of sea turtle activity.
- If a sea turtle is observed on the beach during activities, personnel must remain quiet, allowing the turtle to continue her activities. All effort would be made not to obscure the turtle crawl or the nest area.
- If hatchling turtles are observed on the beach, all activities would cease until the hatchlings reached their destination. All effort would be made not to obscure the turtle crawls or the nest from where they emerged. Following completion of the activity, Eglin Natural Resources Section must be contacted to verify the nest hatching.
- For testing or training activities with the potential to impact hatchlings (as determined by Eglin NRS), a NRS-approved biologist or their designee must be stationed at each nest that was at or past incubation day 50, provided the observer there is no safety issue from the testing or training activity. In the event that the nest hatched, the observer will coordinate with the training/testing participants to ensure that the hatchlings have unimpeded access to the water.
- Eglin military and civilian personnel will be notified that, upon locating a sea turtle adult, hatchling, or egg that has been harmed or destroyed, contact must be made with the Eglin Natural Resources Section; a 24-hour emergency contact will be provided to user groups.
- For Eglin NRS approved overnight staging vehicles and watercraft on the beach: vehicles and watercraft may be staged overnight at water's edge with silt screens installed around the base of the vehicles/craft/equipment, to be removed immediately following the operation. If a vehicle is left on the beach for more than one night, then mission personnel must be present at the vehicle to ensure that no turtles become entrapped.

Lighting Visible from the Beach from 01 May to 31 October

- Activities requiring beachfront lighting must be coordinated through NRS to ensure state guidelines for sea turtle lighting are followed (Appendix B).
- To the extent practicable, lighting associated with testing and training activities must be minimized through reduction, shielding, lowering, and appropriate placement of lights to prevent the glowing portion of any luminaries (including lamp, globe, or reflector) from being directly visible from anywhere on the beach.

- Personnel conducting work and/or operating equipment on or adjacent to the beach, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights (i.e. red filter tape over light source) and lighting on equipment at night.
- Helicopter insertions must be brief, with lighting kept to the minimum necessary for safety.
- OA-HITL Tower lights, except aviation safety lights, will be turned off during sea turtle season.

2.4.8 Additional Avoidance and Minimization Measures for Ground Operations during Shorebird Nesting Season

- From **01 March to 31 August**, shorebird surveys would be required for specific test events or training cycles.
- Any nests or colonies of shorebirds found within the test event or training area must be clearly marked and avoided. A reasonable buffer would be established to protect the nest from disturbance.

2.5 EGLIN NATURAL RESOURCES SUPPORT ACTIVITIES

Eglin Natural Resources Section provides multiple mission support services under the *Eglin AFB Integrated Natural Resources Management Plan* (USAF, 2009). These activities are summarized below.

2.5.1 Posting of Piping Plover Critical Habitat and *Cladonia* Habitat

The NRS will continue to post piping plover designated critical habitat and *Cladonia* habitat for avoidance by testing and training activities. Eglin NRS conducts semi-monthly shorebird surveys for presence of piping plovers within the designated critical habitat and all along SRI. *Cladonia* habitat is surveyed by Eglin NRS every five years or directly after a hurricane has occurred. *Cladonia* habitat on SRI was last surveyed in February 2011.

2.5.2 Eglin Natural Resources Section Sea Turtle Monitoring and Relocation Program

Eglin NRS will continue to support the testing and training by marking and protecting all known sea turtle nests in accordance with established NRS protocol so that they can be easily identified by vehicle operators and troops. An additional 50-foot boundary will be marked around all nests occurring within active testing and training areas using reflective tape.

2-10

A sea turtle nest relocation program will be implemented in the A-15 Designated Training Area (1.5 miles). In areas where LCAC amphibious landings (A-13B 0.5 mile corridor) would be conducted between 01 May and 31 October, Eglin Natural Resources Section must be notified at least 80 days prior to the action in order to relocate nests in that area. All nests within the A-15 Designated Training Area and A-13B landing corridor will be relocated at least 50 feet from the these areas.

2.5.3 Eglin Natural Resources Section Shorebird Monitoring and Protection Program

Shorebird nesting season at SRI is approximately 01 March through 31 August. During this period, Eglin NRS conducts semi-monthly shorebird surveys to collect data regarding the populations of the protected species. Although natural forces including hurricane activity continually change the landscape of SRI, Eglin NRS annually observes and documents areas that appear to be preferred by nesting shorebirds. In an attempt to designate and protect these areas, Eglin NRS posts signs to discourage foot traffic and AF operational activities. Any nests or colonies of shorebirds found within the testing and training area must be clearly marked and avoided. A reasonable buffer would be established to protect the nest from disturbance.

Eglin Natural Resource biologists have also conducted a snowy plover banding project on SRI over the past three years. This species has the potential to become federally listed in the near future. During the breeding seasons, weekly surveys were conducted to find all snowy plover nests on Eglin's beaches. All nests found were recorded by GPS and monitored until hatching; then the chicks were banded (some unbanded adults were captured as well). During nesting surveys, the location of all observed banded birds was recorded. This data may be used to generate maps showing nesting and foraging locations of all banded birds. Hatchling survival rate may also be estimated.

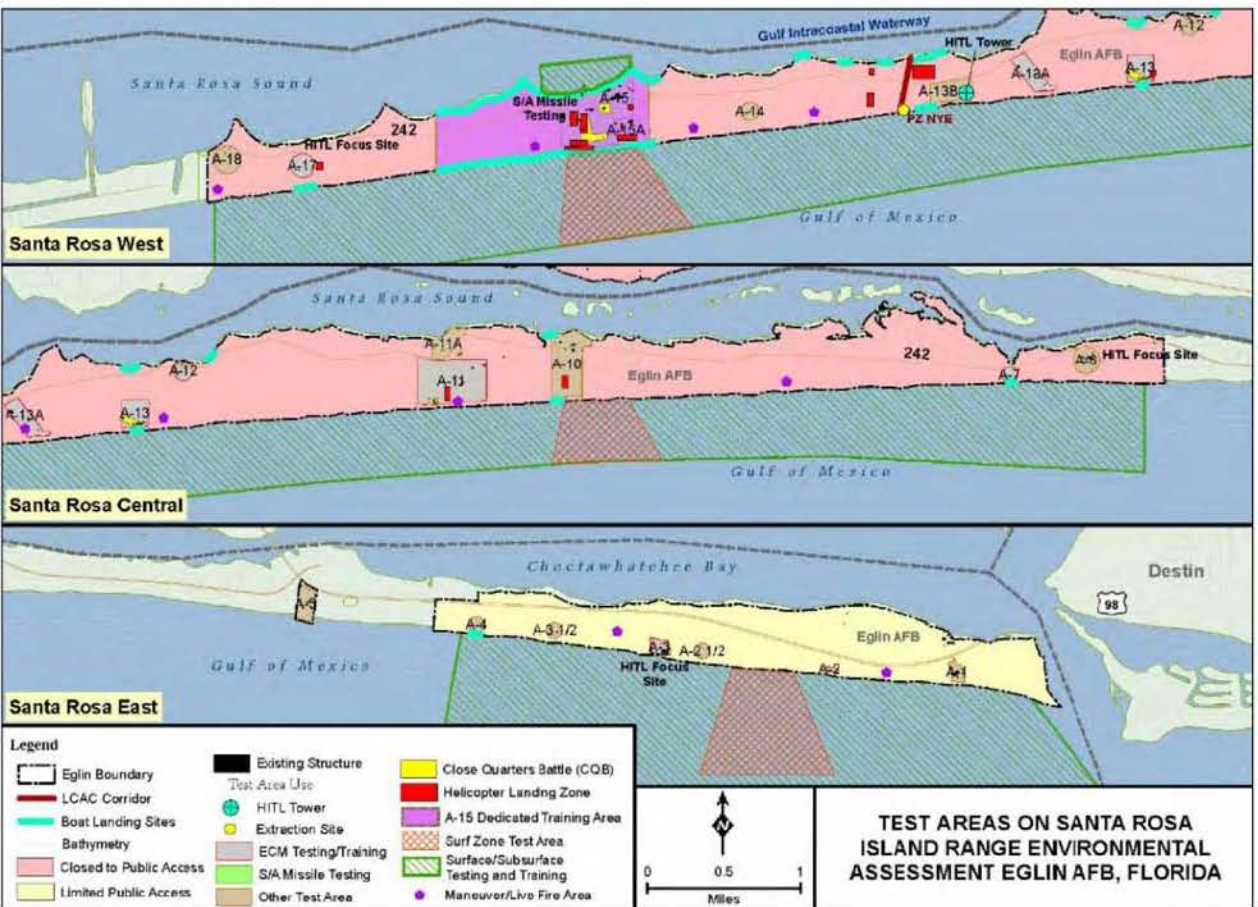


Figure 2-1. Santa Rosa Island Testing and Training Areas

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Figure 2-2. A-15 Designated Training Area on Santa Rosa Island

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3. BIOLOGICAL INFORMATION

Six federally listed endangered (E) and threatened (T) species are known to occur at or near the project area, as well as federally designated critical habitat for the piping plover. Additionally, several shorebird nesting areas and habitat for the Santa Rosa beach mouse are located on SRI. The following list indicates those federally listed species considered for this action:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Atlantic Green Sea Turtle	<i>Chelonia mydas</i>	E
Atlantic Loggerhead Sea Turtle	<i>Caretta caretta</i>	T
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E
Piping Plover	<i>Charadrius melodus</i>	T
Florida perforate lichen	<i>Cladonia perforata</i>	E

There are five species of marine turtles found in the GOM; four species are known to nest on SRI beaches. These species are the Atlantic green sea turtle, Atlantic loggerhead sea turtle, the leatherback sea turtle, and the Kemp's ridley sea turtle. However, the majority of nests on SRI are from loggerhead sea turtles. The sea turtle nesting and hatching season in northwest Florida occurs from 01 May through 31 October, with most hatching between mid-August and mid-October.

3.1 ATLANTIC GREEN SEA TURTLE

The green sea turtle was listed as federally threatened on 28 July 1978 in all its eastern range of North America, except in Florida where it is listed as endangered. It is also state-listed as endangered. In the United States, it nests in small numbers in Georgia, South Carolina, and North Carolina, and in larger numbers in Florida. The green turtle nesting aggregation in Florida is recognized as a regionally significant colony (USFWS NFFO, 2009a). The officially recognized nesting and hatching season for the green sea turtle extends from 01 May through 31 October in Florida's panhandle. Eglin AFB SRI property supports the highest number of green sea turtle nests in northwest Florida. Primarily a tropical herbivore, the juveniles are frequently found in the GOM in areas where there is an abundance of seagrass (USFWS NFFO, 2009a).

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3.2 ATLANTIC LOGGERHEAD SEA TURTLE

The loggerhead turtle, federally and state-listed as threatened, gained its status on 28 July 1978. On March 16, 2010, the NMFS and USFWS proposed listing of nine distinct population segments of loggerhead sea turtles as endangered or threatened. Loggerhead nests in Florida account for ninety percent of all loggerhead nests in the United States. From March through June, adult loggerheads congregate in the nearshore and offshore waters of the GOM to mate. Their nesting sites are on the numerous barrier islands and beaches between the Florida Keys and the northern GOM. Nesting females approach SRI in the spring and summer to dig their nests between the high tide mark and the dune line and sometimes between dunes. Nest incubation averages seventy-one days. These turtles are the most commonly seen sea turtles in the southeastern United States and may be found near underwater structures and reefs (USFWS NFESO, 2010). The diet of loggerheads consists of gastropods, mollusks, coelenterates, and cephalopods.

3.3 LEATHERBACK SEA TURTLE

The leatherback sea turtle was originally listed as federally endangered on 2 June 1970 and is considered a state-listed endangered species. This species commonly nests along the shorelines of the Atlantic, Pacific, and Indian Oceans (USFWS NFFO 2009b). Only infrequent nesting activity has been documented for the leatherback in northwest Florida. The officially recognized nesting and hatching season for the leatherback extends from 01 March through 30 September, with nest incubation ranging from sixty to seventy-five days. Until the spring of 2000, the only confirmed leatherbacks nesting in northwest Florida were in Franklin and Gulf Counties. In May and June 2000, leatherback nesting activity was documented for the first time in Okaloosa County on Eglin's portion of SRI. The leatherback feeds primarily on jellyfish, but occasionally will eat sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

3.4 KEMP'S RIDLEY SEA TURTLE

The Kemp's ridley sea turtle was originally listed as federally endangered on 2 December 1970. Adults have the most restricted distribution of any sea turtle and are typically confined to the GOM, while post-pelagic turtles can be found over crab-rich sandy or muddy bottoms. This species commonly nests from April to June along the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America (USFWS NFFO, 2009c). The Kemp's ridley is a rare nester on Eglin beaches and was documented for the first time in 2008 when three nests were deposited on SRI. One event was witnessed by spectators while the turtle was actually laying her eggs, the other two nests were confirmed by DNA testing. Since the confirmed nesting in 2008, Kemp's have returned to SRI in 2010 and 2011. Eglin Natural Resource biologists believe this is a new

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trend developing and will consider the Kemp's in the "take" analysis even though there are only a few years of data thus far.

3.5 PIPING PLOVER

The piping plover (*Charadrius melodus*) is listed as "threatened" by both the State of Florida and federally. This bird's primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies. Piping plovers are commonly documented during winter in the Florida panhandle, with highest numbers of birds occurring in Franklin, Gulf, and Bay counties. Even though Florida has not been considered a primary wintering area for piping plover, diminishing habitat along other Gulf coast areas may be affording the piping plover new wintering grounds in Florida. At Eglin the winter foraging period runs from 15 July to 15 May. These wintering grounds are still considered less suitable, thus forcing the piping plover to utilize isolated patches. As a result, critical habitat has been designated for piping plovers along the Gulf coast of Florida, a portion of which covers SRI North of Test Site A-18. In addition, Eglin NRS personnel have also designated other protected areas on SRI that are considered additional protected habitat areas based on historical nesting surveys and are afforded the same protection as designated critical habitat.

3.5.1 Piping Plover Critical Habitat

Wintering critical habitat for the piping plover was designated on 10 July 2001. Critical habitat is a term that refers to specific geographic areas that contain the essential habitat features necessary for the conservation of threatened and/or endangered species. These essential habitat features are found in coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. At the time of designation, the critical habitat areas do not necessarily have to be occupied by piping plovers. Critical habitat areas may require special protection or management considerations for current populations as well as potential population increases necessary to achieve species recovery.

The USFWS has identified several activities that may potentially have adverse impacts on piping plover critical habitat. Such activities may include dredging and dredge spoil placement; seismic exploration; construction and installation of facilities, pipelines, and roads associated with oil and gas development, oil spills, and oil spill cleanup; construction of dwellings, roads, marinas, and other structures; staging of equipment and materials; beach nourishment, stabilizations, and cleaning; all-terrain vehicular activity; storm water and wastewater discharge; sale, exchange, or lease of federal land that contains suitable habitat that is likely to result in the habitat being degraded; marsh restoration; and military maneuvers (USFWS, 2007).

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3.6 FLORIDA PERFORATE LICHEN

Florida perforate lichen (*Cladonia perforata*) is federally listed as “endangered” and has a very restricted population, attributable primarily to a significant loss of its historic habitat. The lichen is endemic to Florida’s white sand scrub habitat dominated by sand pine, rosemary, and other scrub oaks such as sand oak, live oak and myrtle oak. It typically occurs in open areas between patches of scrub vegetation. In addition to habitat loss, it is also threatened by trampling/human disturbance, storm surge overwash, and is susceptible to fires (USFWS, 1999).

In an attempt to protect the known populations, Eglin NRS maintains posted signs and barriers to discourage foot traffic and AF operational activities within the *Cladonia* habitat areas. Additionally, to discourage human disturbance and increase general awareness, informational signs are posted at public beach access points regarding the barrier island ecosystem and the species it supports.

3.7 OTHER SPECIES CONSIDERED

3.7.1 Santa Rosa Beach Mouse

The Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*) is one of seven extant beach mouse subspecies, five of which inhabit the panhandle of Northwest Florida. Of the five gulf subspecies, the Santa Rosa subspecies is the only one not currently listed by either the state or the federal government. Beach mice are mostly nocturnal, and burrow nests in dunes. They inhabit frontal dune and scrub habitat within the coastal dune ecosystem on SRI, preferring sand-covered slopes with patches of grasses and herbs, and their diet consists of seeds and fruits of beach plants, as well as insects (Bird, 2003).

Beginning in 2004, Eglin NRS increased survey frequency and began conducting monthly surveys to determine the severity of the impact of past hurricanes to the population. Since then, preliminary results indicate that beach mice are still present, but additional data is required to determine the status of the current population. To supplement track-count surveys, Eglin NRS has also incorporated the Florida Fish and Wildlife Conservation Commission (FWC) tracking tube survey protocol (surveys occur every two months). Tracking tube surveys now provide data regarding the presence/absence of beach mice in varied ecosystems on Eglin’s portion of SRI. This tracking tube method has been developed as a potential alternative to survey for presence/absence of the species. By maintaining both survey types, Eglin NRS hopes to provide comparative data regarding the subjectivity for each method.

3.7.2 Shorebirds, Wading Birds and Shorebird Nesting Areas

The following protected species of shorebirds are typically found on SRI:

<u>Common Name</u>	<u>Scientific Name</u>	<u>State Status</u>
Snowy plover	<i>Charadrius alexandrinus</i>	Threatened
Least tern	<i>Sterna antillarum</i>	Threatened
Little blue heron	<i>Egretta caerulea</i>	Species of Special Concern
Tricolor heron	<i>Egretta tricolor</i>	Species of Special Concern
Snowy egret	<i>Egretta thula</i>	Species of Special Concern
White ibis	<i>Eudocimus albus</i>	Species of Special Concern
American oystercatcher	<i>Haematopus palliatus</i>	Species of Special Concern
Black skimmer	<i>Rhynchopsniger</i>	Species of Special Concern
American Brown Pelican	<i>Pelecanus occidentalis</i>	Species of Special Concern
Reddish Egret	<i>Egretta rufescens</i>	Species of Special Concern
Great egret	<i>Ardea alba</i>	FNAI-Tracked Species
Wilson's plover	<i>Charadrius wilsonia</i>	FNAI-Tracked Species
Caspian tern	<i>Sterna caspia</i>	FNAI-Tracked Species
Royal tern	<i>Sterna maxima</i>	FNAI-Tracked Species
Sandwich tern	<i>Sterna sandvicensis</i>	FNAI-Tracked Species

Shorebird nesting season at SRI is approximately 01 March through 31 August. During this period, Eglin NRS conducts semi-monthly shorebird surveys to collect data regarding the populations of the protected species. Although natural forces including hurricane activity continually change the landscape of SRI, Eglin NRS annually observes and documents areas that appear to be preferred by nesting shorebirds. In an attempt to designate and protect these areas, Eglin NRS posts signs to discourage foot traffic and AF operational activities.

Eglin Natural Resource biologists have also conducted a snowy plover banding project on SRI over the past three years. This species has the potential to become federally listed in the near future. As a result of beach nourishment around Test Areas A-13 and A-13B, the USFWS requested that Eglin conduct snowy plover nest monitoring. During the breeding seasons, weekly surveys were conducted to find all snowy plover nests on Eglin's beaches. All nests found were recorded by GPS and monitored until hatching; then the chicks were banded (some unbanded adults were captured as well). During nesting surveys, the location of all observed banded birds was recorded. This data may be used to generate maps showing nesting and foraging locations of all banded birds. Hatchling survival rate may also be estimated. In addition to information regarding the potential impacts of beach nourishment, additional species data were gained. Results show that some snowy plovers nest in the same location each year, while others use different locations in the same general area. Also, juveniles that have returned to their natal site typically do not breed until the second year. Nest site selection is highly variable among birds.

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Some birds nest on bare sand in flat areas in front of, between, or behind dunes. Others nest on top of dunes in grass, or in rocky areas. Banded birds were seen wintering as far west as Biloxi, Mississippi and as far south as central Florida.

4. DETERMINATION OF EFFECTS

4.1 INTRODUCTION

Potential impacts to protected species from testing and training activities within the SRI ROI are analyzed according to general effector categories, which were identified as direct physical impact, harassment and habitat alteration. Species and habitats would be affected by a number of testing and training missions (Figure 4-1). However, specific mission-related avoidance and minimization measures would decrease the severity of effects so that significant impacts to biological resources would not occur.

Based on the scope of the Proposed Action, as described in Chapter 2 of this BA, potential impacts to sensitive species can be categorized as follows:

- Direct Physical Impacts (DPI) – Physical harm (i.e. injury or mortality) to listed species as a result of human activities. The main causes of DPI associated with the Proposed Action include:
 - Noise impact – Primary mission activities that would produce noise within the SRI ROI include aircraft and LCAC operations, gunnery and missile missions, amphibious craft operation, and surf zone missions. Noise above 140 dB may cause hearing damage in humans and could possibly affect wildlife.
 - Physical contact – Direct impacts to wildlife could result from vehicular, aircraft, boat, and foot traffic, gunnery, and missiles. These types of testing and training activities could potentially cause physical injury to wildlife species. These types of mission activities produce fragments that could potentially cause physical injury to wildlife species. Additionally, vehicular and foot traffic could crush sensitive species, and boats and aircraft could collide with animals, causing injury or death.
 - Nest destruction – Destruction of a nest due to excessive ground disturbance.
- Harassment – Actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Activities under the Proposed Action may result in harassment due to the following:
 - Foraging/nesting disturbance – Disruption of normal breeding/nesting or foraging activity caused by testing or training activities (i.e. noise, equipment, human disturbance). In extreme cases, this can result in mortality of individuals and extremely negative impacts on the survivability of the population (i.e. sea turtle hatchling disorientation due to beach lighting).

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- Habitat Alterations – refer to physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to a species. Habitats may be altered by a variety of factors, including changes in vegetation, structure, food sources, breeding and nesting areas, etc. Habitat alteration may lead to decreased barrier island stability, decreased species survival, or degradation of areas critical to species diversity.

The main drivers behind the impacts identified above are associated with specific activities conducted under each testing and training category. Table 4-1 shows the potential impacts from testing and training activities with the implementation of avoidance and minimization measures as described in Chapter 2 to minimize impacts to protected species.

Table 4-1. Potential Impacts from Testing and Training Activities on Santa Rosa Island

Proposed Action (Major Types of Testing and Training Missions)	Direct Physical Impact			Harassment	Habitat Alteration	
	Impulsive Noise	Physical Contact	Nest/Burrow Destruction	Nesting/ Foraging Disturbance	Soil Erosion	Alteration/ Destruction
S/A Missile Testing	minor	none	none	minor	none	none
ECM Testing	minor	none	none	none	none	none
OA-HITL Testing	none	none	none	minor	none	none
LCAC Crossovers	minor	minor	minor	likely	likely	likely
Ground Testing	minor	minor	minor	likely	minor	minor
Personnel/Equipment Drops and Extractions (including HLZs and BLSs)	minor	minor	minor	likely	minor	minor
Ground Training	minor	minor	minor	likely	minor	minor
Small Boat Obscurant Testing	minor	minor	minor	likely	minor	minor
Live Fire	minor	minor	minor	likely	none	none
Amphibious Assaults	minor	minor	minor	likely	likely	likely
Laser Use/Biological Simulants	none	minor	none	minor	none	none

Given the above information, the following table (Table 4-2) correlates the Proposed Action activities, along with the potential impacts, to each listed species considered in this BA, assuming all avoidance and minimization measures are followed.

Table 4-2. Potential Impacts to Protected Species from Testing and Training on Santa Rosa Island

Proposed Action (Major Types of Testing and Training Missions)	Sea Turtles (Nesting)	Piping Plover	Piping Plover Critical Habitat	Cladonia	Shorebirds (Nesting)	Santa Rosa Beach Mouse
S/A Missile Testing	DPI, H	H	NI	NI	H	H
ECM Testing	H	H	NI	NI	H	H
OA-HITL Testing	H	H	NI	NI	H	H
LCAC Crossovers	DPI, H, Hb	H, Hb	NI	NI	DPI, H, Hb	DPI, H, Hb
Ground Testing	DPI, H	H	NI	NI	DPI, H	DPI, H
Personnel/Equipment Drops and Extractions (including HLZs and BLSs)	DPI, H, Hb	H, Hb	NI	NI	DPI, H, Hb	DPI, H, Hb
Ground Training	DPI, H, Hb	H, Hb	NI	NI	DPI, H, Hb	DPI, H, Hb
Small Boat Obscurant Testing	DPI, H	H	NI	NI	DPI, H	DPI, H
Live Fire	DPI, H	H	NI	NI	DPI, H	DPI, H
Amphibious Assaults	DPI, H, Hb	H, Hb	NI	NI	DPI, H, Hb	DPI, H, Hb
Laser Use/Biological Simulants	H	H	NI	NI	H	H

* DPI = Direct Physical Impact, H = Harassment, Hb = Habitat Impacts, NI = No Impact

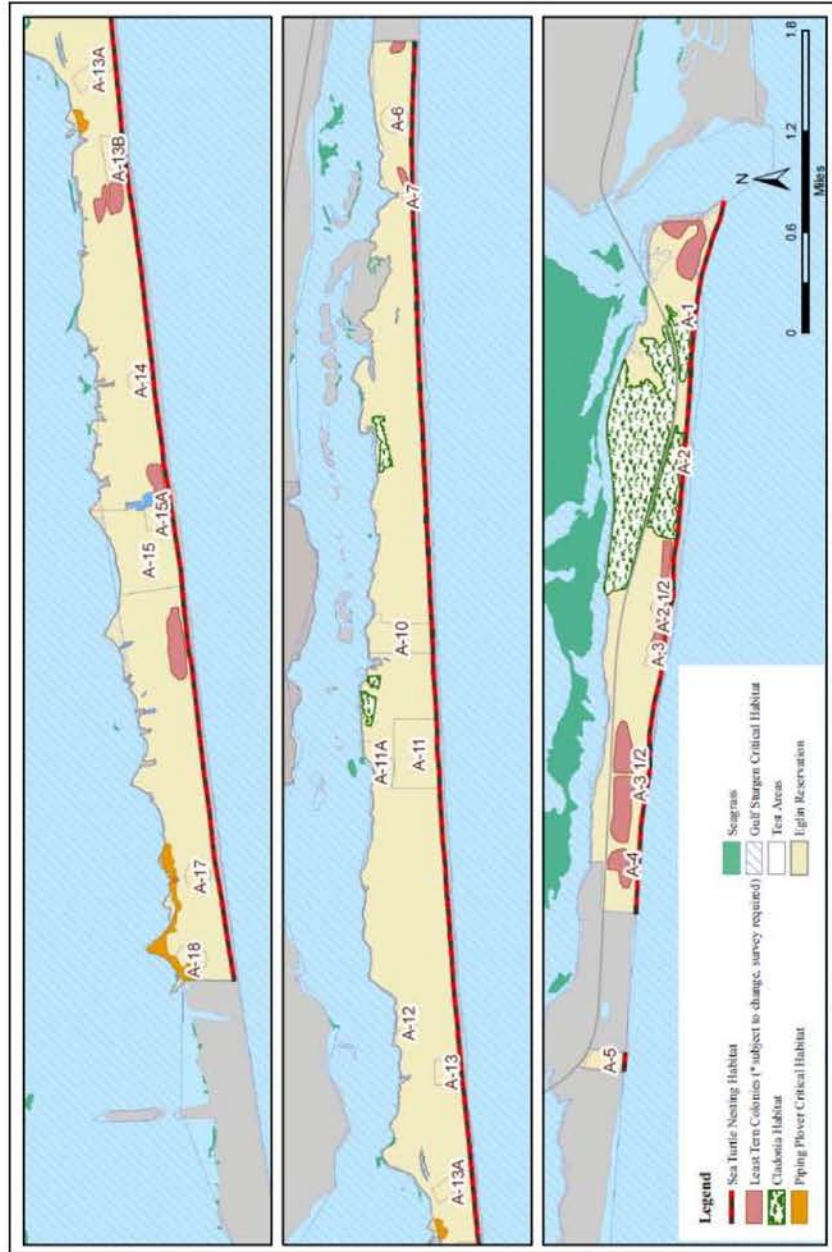


Figure 4-1. Protected Species on Santa Rosa Island

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4.2 EFFECTS DETERMINATION

4.2.1 Sea Turtles Nesting and Hatching Rates

In order to determine potential take of sea turtles for testing and training activities on SRI, this section documents the most recent data on nesting periods, nesting activity and emergence, and other pertinent data to perform proper effects determinations. The sea turtle reproduction cycle on SRI has been divided into four time periods based on historical data (Table 4-3). During the first time period, only nesting occurs. During the second time period, hatchlings emerge from previously laid nests while adult sea turtles continue to come ashore to lay new nests. During the third time period, adults have ceased to come ashore for nesting, while hatchlings continue emerging from existing nests. During the fourth time period, neither nesting nor hatching behavior is expected to occur. The earliest and latest possible dates for all species were selected to produce the combined species time periods.

Table 4-3. Sea Turtle Nesting Periods by Species

Species	Nesting Only	Nesting and Hatching	Hatching Only	Off-Season
<i>Caretta caretta</i>	May 16 – Aug 31	Jul 24 – Aug 31	Sep 01 – Nov 5	Nov 6 – May 22
<i>Chelonia mydas</i>	May 20 – Aug 22	Jul 24 – Aug 22	Aug 23 – Oct 26	Oct 27 – May 19
<i>Dermochelys coriacea</i>	May 12 – Jun 19	N/A	Sep 09 – Sep 21	Sep 22 – May 11
<i>Lepidochelys kempii</i>	Jun 03 – Jul 03	N/A	N/A	N/A
Combined Species	May 12 – Aug 31	Jul 24 – Aug 31	Aug 23 – Nov 5	Nov 6 – May 11

Based on data collected between 1989 and 2010 on the 17 miles of Eglin SRI beaches, the average annual nesting density for loggerheads is approximately 1.13 nests per mile (Table 4-4). During this period, 423 loggerhead nests were recorded. Peak loggerhead nesting on SRI occurs in June and July, with approximately 85.9 percent of nests established during this period (Table 4-4). The average nest incubation length is 67.23 days. Loggerhead hatching peaks in August and September. The average annual nest emergence success rate is 53.7 percent.

Eglin's SRI property supports the greatest number of green sea turtle nests in northwest Florida. A total of 131 green sea turtle nests have been recorded in a 14 year nesting period, on average green sea turtles nest every other year (Table 4-4). The average annual nesting density for green sea turtles is approximately 0.55 nests per mile. Peak green sea turtle nesting occurs in June and July, with approximately 82.1 percent of nests established during this period (Table 4-4). The average nest incubation length is 68.54 days, with a range from 51 to 82 days. Green sea turtle hatching peaks in August and September. The average annual nest emergence success rate is 53.98 percent.

Leatherback nesting has been documented only one year on Eglin SRI, during 2000. Three nests were laid in May and June and hatched in August and September. The Kemp's ridley sea turtle has recently been confirmed to nest on SRI during the 2008 and 2010 nesting season. The nests have not had viable eggs, so no hatching data is available for this species. Not enough data is available for these two species of sea turtles to calculate average annual nesting density, however due to the recent trend of Kemp's nesting on SRI, Eglin Natural Resources biologists will be including the nesting Kemp's ridley sea turtle in the overall take analysis for Santa Rosa Island testing and training activities.

Loggerhead nesting peaks in June (Figure 4-2). Dividing the average number of nests occurring in June by 30 days yields a peak nesting emergence rate of 0.33 nests per night. By the same method, during a green turtle nesting year, the peak nesting emergence rate is calculated to be 0.15 nests per night (average number of green turtle nests in July, divided by 31 days). The Kemp's Ridley peak nesting rate is calculated to be 0.06 (average number of Kemp's nests in May, divided by 31). To determine the peak nesting rate within a 0.5-mile section of beachfront, the peak nesting emergence rate for each species is divided by the number of 0.5-mile segments comprising Eglin AFB sea turtle nesting beach (i.e. 34). Therefore, the peak rate of loggerhead turtle nesting emergences is 0.01 nests per night per 0.5 mile, the peak rate of green turtle nesting emergences is 0.004 nests per night per 0.5 mile, and the peak rate of Kemp's nesting is 0.001 per 0.5 mile. Because only three leatherback nests have been documented on Eglin AFB SRI over a 22-year period, the leatherback nesting emergence rate is effectively nil.

Table 4-4. Sea Turtle Nesting on Santa Rosa Island, Eglin AFB

	Loggerhead	Green	Leatherback	Kemp's Ridley
Total number nests	423	131	3	5
Years nesting documented	1989-2010	1990, 1992, 1994, 1996, 1997, 1998, 2000, 2002, 2003, 2005, 2006, 2007, 2008, 2010	2000	2008, 2010
Earliest documented nest	May 16	May 20	May 12	6/3
Latest documented nest	Aug 31	Aug 22	June 19	7/3
Average annual number of nests	19.2	3.36	insufficient data	insufficient data
Average annual number of nests per mile	1.13	.55	insufficient data	insufficient data
Peak nesting period (two peak months)	June and July	June and July	insufficient data	insufficient data
Percentage of nests laid during the two peak months	85.9%	82.1%	insufficient data	insufficient data

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Peak hatching period (two peak months)	August and September	August and September	insufficient data	insufficient data
Average number eggs in a nest	110.5	137.97	insufficient data	insufficient data
Average annual nest emergence success rate	53.7%	53.98%	insufficient data	insufficient data
Incubation period (range)	52-89 days	51-82 days	insufficient data	insufficient data
Incubation period (average)	67.23 days	68.54 days	insufficient data	insufficient data
Estimated number of hatchlings produced annually*	2121.6	1291.4	insufficient data	insufficient data

*Assumes 100 percent survival

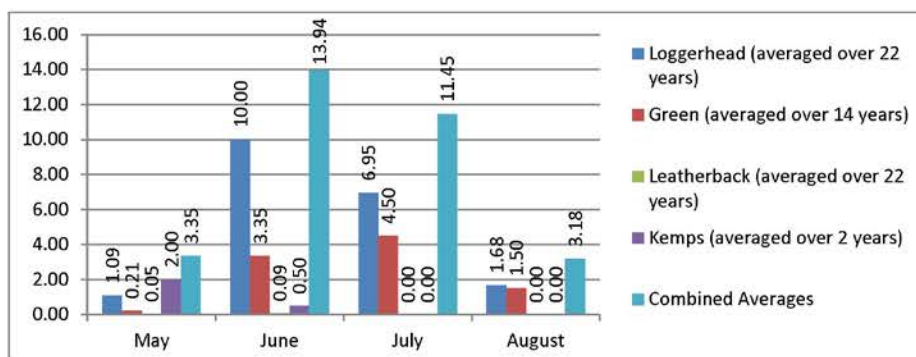


Figure 4-2. Eglin AFB SRI Average Sea Turtle Nest Occurrences by Month (1989-2010)

Because historical hatchling emergence data for Eglin AFB SRI are incomplete, an expected average emergence by month was calculated for each species based on the available emergence data. For example, hatchling emergence dates have been recorded for 232 of 423 total loggerhead nests. Of the 232 recorded hatching dates, only four (1.72 %) occurred in July. If this percentage is applied to the total number of loggerhead nests recorded, 7.27 loggerhead nests would be expected to have hatched in July over the 22-year data collection period, yielding an average of 0.38 loggerhead hatchlings annually during the month of July. Once again, the total for green sea turtles was averaged over 14 years. Table 4-5 summarizes this information and also provides an estimated number of hatching events expected in each given month. Emergence dates are not available for a randomly selected sample of nests for each species, and therefore these averages may be slightly skewed. However, because emergence dates were available for 305 out of the 557 total nests (55 percent), the calculated averages for the number of nests hatching per month should suffice for purposes of this analysis (Table 4-5).

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Table 4-5. Eglin AFB SRI Calculated Average Sea Turtle Hatching Occurrences by Month

		Loggerhead	Green	Leatherback	Kemp's	Combined
	Total Nests	423	131	3	5	562
	No. Nests with recorded hatching dates	232	71	2	0	305
July	Calculated Average	0.33	0.26	0.0	NA	0.30
August	Calculated Average	10.11	2.64	0.0	NA	7.20
September	Calculated Average	6.96	4.35	0.18	NA	5.90
October	Calculated Average	1.65	2.10	0.0	NA	1.83
November	Calculated Average	0.17	0.0	0.0	NA	0.10

4.2.2 Impacts to Sea Turtles from Testing/Training Activities

Artificial Lighting Used during Test Events or Training Cycles from 01 May to 31 October

Mission-related lighting could affect nesting adult and hatching sea turtles. Testing or training that routinely requires artificial lighting during nighttime conditions should avoid sea turtle season (01 May to 31 October) if possible. If not possible, avoidance and minimization measures would include conversion to low-pressure sodium vapor lighting or light-emitting diode (LED) lights and use of light shields to direct light away from the beach (Gulf-side), as well as turning off any unnecessary lights. These lighting requirements would apply to testing and training activities such as vehicle and troop maneuvers or equipment setup on the beachfront. Personnel conducting work, including beach approved driving and/or operating equipment on or adjacent to the beach during sea turtle nesting season, would use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible handheld lights and lighting on equipment at night. Any helicopter insertions would be brief and lighting would be kept to a minimum; thus no impacts from helicopter lights are anticipated. Avoidance and minimization measures listed in Chapter 2 apply to all testing and training missions using artificial lighting from 01 May to 31 October. User groups must coordinate with the Eglin NRS to implement these measures.

- Low-pressure sodium lights or LED lights would be used and all lights used would be shielded from the beach and directed landward. Non-mission essential lighting would be turned off (See Appendix B for appropriate lighting during sea turtle season).

Surface-to-Air Missile Testing

Up to 12 PATRIOT missile launches could occur annually under the Proposed Action. The primary noise impact from the PATRIOT missile is the subsonic noise that results from launch and overflight of the missile. It is expected that that sea turtles within 0.2-mile of a PATRIOT missile launch would be exposed to a short duration (11 seconds) of a maximum noise level greater than

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115 dB. Noise levels decrease to less than 95 dB 2 miles from the launch site. This contour encompasses nearly 12 square miles of water and land. To avoid such impulsive noise impacts, no nighttime S/A missile testing would be conducted during sea turtle season (a separate Section 7 consultation would be required for nighttime missile launches).

There is the potential for direct physical impacts to sea turtles from movements of vehicles, equipment, and personnel on the beachfront during missile setup and launch activities (i.e. military police ATV patrols, DoD spectators accessing the beach to observe the launch). To reduce impacts to sea turtles, daytime setup would be preferred and Eglin Natural Resources approved personnel would survey the area prior to and be present during setup activities. If nighttime setup on the beachfront is required, setup would be limited to outside of sea turtle season when possible. For instances where that is not possible, an Eglin Natural Resources approved observer would be present during setup activities to identify signs of sea turtle activity. If a sea turtle were observed on the beach, personnel would remain quiet, allowing the turtle to continue her activities. If hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination.

Light sources used during nighttime setup of missile/drone launches have the potential to disorient sea turtles. For this reason, missile launches requiring nighttime setup would be avoided during sea turtle season (01 May to 31 October) if possible. If not possible, all deemed essential lighting needs would be coordinated with the Eglin NRS. Mission-essential artificial lighting must be low-pressure sodium shielded lights that prevent illumination of the beach. Where color rendition or explosive-proof fixtures are required, a well-shielded, high pressure sodium or LED light may be used. Avoidance and minimization measures listed in Chapter 2 would apply to all surface-to-air missile testing, which include:

- No nighttime test events would occur during sea turtle season (01 May through 31 October).
- Missile launches requiring nighttime setup would avoid sea turtle season if possible.
- Prior to setup, Eglin Natural Resources approved personnel would conduct a pre-mission survey of the area. Sea turtle nests and shorebird nests would be marked and avoided.
- Eglin Natural Resource approved personnel would be present during setup and test event during sea turtle nesting season for daytime or nighttime activities.
- Sea turtle nests would be marked, and any hatchlings disoriented by setup activities would be redirected toward the shoreline by Eglin NRS approved personnel. Only persons on Eglin's sea turtle permit would be allowed to interact with sea turtle adults or

hatchlings. Persons not included on the permit who encounter a sea turtle would contact Eglin NRS.

- During sea turtle season, low-pressure sodium vapor lighting and light shields would be used, and all unnecessary non-mission or safety lights would be turned off.

ECM and Electronic Systems Testing

Aircraft noise and lights associated with electronic countermeasure (ECM) testing have the potential to harass sea turtles. To minimize the potential for harassment, nighttime ECM operations would be minimized during sea turtle season (01 May to 31 October), especially during the peak nesting season (June and July) to avoid deterrence impacts. Avoidance and minimization measures listed in Chapter 2 would apply to all OA-HITL operations, which include:

- ECM night operations would be minimized during sea turtle nesting season (01 May through 31 October) when possible, especially during the peak nesting season for each sea turtle species (June and July).
- Personnel and equipment would remain on paved Test Site areas during testing.
- Low-pressure sodium lights or LED lights would be used and all lights used would be shielded from the beach and directed landward. Non-mission essential lighting would be turned off.

OA-HITL Testing

Aircraft noise and lights associated with Open Air Hardware in the Loop (OA-HITL) Tower testing have the potential to harass sea turtles. To minimize the potential for harassment, nighttime OA-HITL tower operations would be minimized during sea turtle season, especially during the peak nesting season (June and July) to avoid deterrence impacts. Avoidance and minimization measures listed in Chapter 2 would apply to all OA-HITL operations, which include:

- OA-HITL Tower night operations would be minimized during sea turtle nesting season (01 May through 31 October) when possible, especially during the peak nesting season for each sea turtle species (June and July).

- All lights on the tower, except aviation safety lights, will be turned off during sea turtle season (01 May through 31 October).

Ground Testing

Ground testing can either be support activities on land for operations in the surf zone (i.e. mine countermeasures testing), or independent tests on land (i.e. testing of biological simulants). Independent tests on land usually are for equipment requiring testing in a high humidity coastal environment. Setup activities and exercises associated with these tests may require beachfront activities involving vehicles, personnel, equipment, and objects such as inert mines and obstacles. Both mine countermeasures and independent tests usually require only a small portion of the beach (less than 100 feet of beachfront) and activities typically last only a few days.

Nighttime activities on the beachfront during ground testing have the potential to directly impact sea turtles. During sea turtle season, vehicle and human activity on the beachfront at night could: serve as deterrents to nesting sea turtles; create ruts that could impede hatchling movements; destroy nests; disorient turtles; and obscure evidence of sea turtle crawls and nests. When possible, nighttime ground testing on the beachfront would be limited to outside of sea turtle season. For times when testing must occur during turtle season, an Eglin Natural Resources approved observer would be present during setup activities to identify signs of sea turtle activity. If a sea turtle were observed on the beach during activities, personnel would remain quiet, allowing the turtle to continue her activities. If hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination. All effort would be made not to obscure adult and hatchling turtle crawls, nest areas, or the nest from where hatchlings emerged.

During sea turtle season, vehicle movements on the beach would be limited to daytime hours when possible. Vehicle operators would be instructed to stay within designated operation areas and to remain at least 50 feet from any sea turtle nests and the primary dune line thereby reducing impacts to nesting habitat. Vehicle access to the beach would be limited to daytime hours during sea turtle season. Ruts would be removed before sunset. Any equipment or vehicles that were left on the beachfront overnight would need to have silt screen installed around their base to prevent the entanglement of sea turtles. Avoidance and minimization measures listed in Chapter 2 would apply to all ground testing activities, which include:

- An Eglin Natural Resources approved observer would be present during nighttime setup activities to identify signs of sea turtle activity.

- During sea turtle season, vehicle movements on the beach would be limited to daytime hours when possible.
- Any equipment or vehicles that were left on the beachfront overnight would need to have silt screen installed around their base to prevent the entanglement of sea turtles.

Personnel/Equipment Drops and Extractions (including HLZs and BLSs)

A total of 16 BLSs would be designated on the sound- and Gulf-sides of SRI. This would include designation of 10 new sites in addition to 6 existing sites. A total of 14 helicopter landing zones HLZ would be designated, including 9 on unimproved surface and 5 on paved surface. All aircraft and boats will use designated landing areas located on Santa Rosa Island (Figure 2-1). Prior to nighttime aircraft or boat operations on SRI, user groups must coordinate with Eglin Natural Resources. Helicopters and boats may provide support and surveillance for any training activity conducted on SRI. For example, brief helicopter landings and low-altitude helicopter operations (less than 5 minutes for each activity) currently occur about once a month during 6RTB training. The probability of a nesting female attempting to enter the beach within a half-mile radius of these activities is considered low, even during peak nesting periods. Personnel/equipment drops may occur in the surf zone, therefore there is the potential for direct impacts to sea turtles in the water. Although it is unlikely that a sea turtle would be directly impacted, to minimize the potential for deterrence, nighttime personnel/equipment drops and extractions would be minimized during sea turtle nesting season, especially during the peak nesting season for each species (June and July). To minimize potential impacts to nests and hatchlings between 01 May and 31 October, if a sea turtle nest were located within 200 feet of the HLZ or 50 ft of a BLS, another HLZ or BLS would be used for that exercise (potential impacts that could occur once personnel are on the beach are covered under the Ground Training section). Avoidance and minimization measures listed in Chapter 2 would apply to all personnel/equipment drops and extractions, which include:

- Night personnel/equipment drops and extractions would be minimized during sea turtle season (from 01 May through 31 October), especially during the peak nesting season for each sea turtle species (June and July).
- Missions would use established HLZs and BLSs.
- From 01 May to 31 October, if surveys indicated a sea turtle nest within 200 feet of the HLZ, another HLZ would be used for that mission.

Ground Training

During sea turtle season, vehicle and human activity on the beachfront could: damage dunes/vegetation; serve as deterrents to nesting sea turtles; create ruts that could impede hatchling movements; destroy nests; disorient turtles; obscure evidence of sea turtle crawls and nests; and directly impact sea turtle adults and hatchlings from foot and vehicle traffic. Currently Los Banos Training, Advanced Skills Training, 23rd Special Tactics Squadron, and HAVE ACE activities occur on SRI. Under the proposed action, these exercises could increase to achieve an optimum usage level. In order to reduce impacts to sea turtle nesting habitat, a designated training area has been established around Test Area A-15 (Figure 2-2). Ground training units will be encouraged to use this area as their training site when possible. By using this established training area, impacts to surrounding nesting habitat should be reduced.

When possible, nighttime ground training on the beachfront would be minimized during sea turtle season (01 May to 31 October). If training occurs outside of the A-15 Designated Training Area, all marked sea turtle nests would be avoided by 50 ft and an Eglin Natural Resources approved observer would be present during nighttime training operations to identify signs of nesting sea turtles. The observer would be responsible for assuring that the training participants did not interfere with nesting sea turtles or impede hatchling sea turtles from emerging from the nest and crawling to the Gulf. If a sea turtle were observed on the beach during ground training activities, personnel would remain quiet and keep moving, allowing the turtle to continue her activities. If hatchling turtles were observed on the beach, all activities would cease until the hatchlings reached their destination. In addition, all ruts larger than 2 feet in diameter caused by training activities must be refilled immediately after the training exercise is over.

If vehicles are required on the beachfront during ground training operations, prior written approval is required from Eglin Natural Resources. For approved beach driving, vehicle movement corridors would be surveyed and marked by Eglin Natural Resources approved personnel. Vehicle operators would be instructed to stay within designated areas and to remain at least 50 feet from the primary dune line and marked sea turtle nests. All ruts created from vehicle use would be removed prior to sunset. Vehicles would be staged on paved areas when possible, if it is necessary to stage vehicles on the beachfront during training activities, silt screens would be installed around the base of the vehicles during nighttime operations. Avoidance and minimization measures listed in Chapter 2 would apply to all ground training operations, which include:

- A-15 Designated Training Area would be primary site for ground training activities. All sea turtle nests within this area would be relocated.

- Personnel, vehicles, and equipment operations would avoid marked sea turtle nests by 50 feet.
- Between 01 May and 31 October, when activities would be conducted on the beach during the night, an Eglin Natural Resources approved observer would be responsible for identifying signs of nesting or hatchling sea turtles. The observer would be responsible for assuring that the training participants did not interfere with nesting sea turtles, impede hatchling sea turtles from emerging from the nest and crawling to the Gulf of Mexico, or obscure signs of sea turtle activity.
- Vehicle operators and troops would be instructed to stay within the designated operation area and to remain at least 50 feet from the primary dune line and marked sea turtle nests.
- All ruts from training operations outside of the A-15 Designated Training Area would be removed once training activities are completed.
- To the extent practicable, vehicles would be staged on paved areas. Whenever it is necessary to stage vehicles on the beachfront, silt screens would be installed around the base of the vehicles during nighttime operations.

LCAC Operation and Corridor

LCAC missions have not occurred on SRI since 2002, and there are currently no plans for further amphibious operations. It is anticipated that any future LCAC missions would involve moderate use of the island, and are expected to result in minor impacts from gunnery noise. Although most or all LCAC gunnery training would involve inert munitions, live rounds would only be approved on a case-by-case basis through the AFF 813 process. During a live fire training event, it is likely that deterrence would occur in the immediate vicinity of the LCAC and turtles would move outside of the maneuver area due to the general disturbance. Noise generated from LCAC use on land and water could impact sea turtles, resulting in harassment and adverse effects to nesting abilities. In order to reduce impacts to sea turtles during LCAC missions, firing of 30-mm munitions would be avoided from sunset to sunrise during sea turtle nesting season (01 May to October 31).

LCAC movement is not expected to produce ruts in the sand. However, sand blown from beneath the air cushion may obscure evidence of sea turtle nesting activity. To avoid this, the LCAC movement corridor (near Test Area A-13B) would be surveyed by Eglin Natural Resource approved personnel for sea turtle activity immediately prior to nighttime operations. Operators would be instructed to remain alert at all times to the potential presence of sea turtles on the beach and to stay within the cleared designated crossover corridor. Avoidance and minimization measures listed in Chapter 2 would apply to all LCAC operations, which include:

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- Nighttime LCAC activities would be minimized during sea turtle season.
- LCAC corridor near A-13B would be surveyed prior to conducting mission by Egin Natural Resources approved personnel; the corridor would be flagged and marked.
- Operators would be instructed to remain alert at all times to the potential presence of sea turtles on the beach and to stay within the designated crossover corridor.
- Between 01 May and 31 October, when activities would be conducted on the beach during the night, an Egin Natural Resources approved observer would be present to be responsible for identifying signs of sea turtle activity. The observer would be responsible for assuring that the LCACs did not interfere with sea turtles or obscure signs of sea turtle activity.

Amphibious Assaults

Amphibious landings may involve the use of LCACs (discussed above), Landing Craft Utility (LCUs), AAVs, and Zodiac boats at the land-water interface. Ground movement covers use of tracked vehicles, wheeled vehicles and troop maneuvers on land (these activities are covered under the *Ground Training Section* above). Since 2003, amphibious missions have consisted primarily of Zodiac boat landings. It is anticipated that any future amphibious missions will involve moderate use of the island and are expected to result in minor impacts to sea turtles and their nesting habitat. Coordination with the Egin Natural Resources Section would be necessary to ensure that no sea turtle nests were located in the maneuver area prior to LCU, AAV, and Zodiac boat use and all corridors would be surveyed for evidence of sea turtle activity immediately prior to night activities. To preserve nesting habitat on the island, the movement corridor and maneuver area would be clearly marked. As detailed in the LCAC Crossover section above, erosion impacts from LCACs are expected to be minimal. Avoidance and minimization measures listed Chapter 2 would apply to all amphibious assault operations, which include:

- Nighttime use of zodiac boats for amphibious assaults on the beachfront would be minimized when possible during sea turtle season.
- A sea turtle nest relocation program would be implemented in areas where amphibious landings would be conducted between 01 May and 31 October. Egin Natural Resources Section must be notified at least 80 days prior to the action.
- Landing and movement corridors would be marked so as to be easily distinguished by the operators of amphibious landing vehicles/craft and other vehicles.

- LCACs and AAVs would avoid vegetated areas to the greatest extent practical and would vary their paths within the designated crossover corridor.
- AAV and LCAC use within maneuver areas would be restricted to daylight hours during sea turtle season.
- LCAC and AAV maneuver/training activities would preferentially occur at areas from which nests have been relocated or where no nests occur. Coordination with Natural Resources would be necessary to ensure that no nests are located within the maneuver area prior to AAV/LCAC use.

Small Boat Obscurant Testing

Small boats would be used periodically for obscurant testing throughout the surf zone. No harmful levels of noise would be associated with the use of small boats during these activities. However, small boat use could become a source of deterrence to nesting sea turtles if activities were conducted at night during sea turtle nesting season. For this reason, use of small boats in the Gulf at night during sea turtle nesting season (01 May through 31 October) would be avoided when possible. To minimize the potential for a direct impact, small boat obscurant testing at night during sea turtle season would be avoided when possible and *Sargassum* mats would be avoided. Avoidance and minimization measures listed Chapter 2 would apply to all small boat obscurant testing, which include:

- Testing would avoid sea turtle nesting season (01 May through 31 October) when possible.
- Use of small boats at night would be minimized when possible during sea turtle nesting season, especially during the peak nesting season (June and July).
- *Sargassum* mats would be avoided.
- Operational activities would only occur on concrete or asphalt hardstand areas.

Live Fire

Prior to conducting a live fire training event, coordination with Eglin Natural Resources would be required; the location for these types of activities would be in designated live fire areas, preferably at the A-15 Designated Training Area (Figure 2-2). Live fire activities would involve low-range munitions and would be fired in a seaward direction only. Small caliber weapons between 5.56 mm and .50 caliber would be used. If available, soldiers would use frangible munitions (5.56 mm, 7.62 mm, and .50 cal) with effective ranges of 25 to 150 meters or those of non-lead composition (i.e. tungsten) to reduce or eliminate potential environmental concerns.

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The effective ranges for standard munitions (5.56 mm, 7.62 mm, and .50 cal) vary from 550 meters to 2000 meters. LCAC 30 mm gunfire would also take place on Santa Rosa Island near Test Area A-13B. During sea turtle nesting season, there is a low probability that nesting sea turtles would be directly impacted by munitions and training events could produce noise levels sufficient to deter nesting females or disturb hatchling emergences, however, firing at night on the beaches should be minimized when possible during sea turtle season. To further reduce impacts to sea turtles from live fire training events, between 01 May and 31 October, when activities would be conducted on the beach during the night, Eglin Natural Resources approved personnel would conduct a pre-mission and post-mission survey of the training area. Training would occur at the A-15 designated training area when possible and at least 200 ft from marked sea turtle nests. Avoidance and minimization measures listed in Chapter 2 would apply to all live fire operations, which include:

- Live fire activities at night during the peak sea turtle season (June, July, August, and September) shall occur in areas where there are no nests.
- During the period from 01 May through 31 October, nighttime live fire missions would be minimized whenever possible.
- During the period from 01 May through 31 October, an Eglin NRS approved observer from the training unit must be present to identify signs of sea turtle activity.
- During the period from 01 May through 31 October, if a sea turtle or hatchling were observed on the beach during live fire activities, all firing would cease and troops would remain quiet, allowing the turtle to continue activities.
- During the period from 01 May through 31 October, live fire activities would preferentially occur at the A-15 Designated Training Area or at least 200 ft from marked sea turtle nests.
- Frangible or non-lead munitions would be used when possible.

Laser Use

Laser use would mainly occur over the Designated Training Area at A-15. Lasers are enclosed in a light-tight enclosure with a mechanical shutter for stopping illumination when not flying over target fields. In addition, a number of laser safety devices are incorporated into the system to prevent inadvertent laser operation. Therefore, lasers are not anticipated to impact sea turtles. Aircraft noise and lights associated with laser use have the potential to harass sea turtles. To minimize the potential for deterrence, nighttime laser operations would be minimized during sea

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turtle nesting season, especially during the peak nesting season (June and July). Avoidance and minimization measures listed in Chapter 2 would apply to all laser operations, which include:

- Laser operations would be minimized during sea turtle nesting season (01 May through 31 October) when possible, especially during the peak nesting season (June and July).
- Laser operations would mainly occur within the Designated Training Area at A-15.
- Low-pressure sodium lights or light-emitting diode (LED) lights would be used and all lights used would be shielded from the beach and directed landward. Non-mission essential lighting would be turned off.

4.2.3 Summary of Impacts to Sea Turtles from Testing and Training Activities

Testing and training activities may occur 365 days a year along Eglin's 17-miles of SRI beaches; direct impacts and harassment to sea turtles may occur between May 01 and October 31, and habitat alteration could occur at any time of the year. Within the 6-month sea turtle season, the period of greatest potential for impacts to all the sea turtle species would be at night during peak nesting in June and July when the majority of the nests are laid, and during August and September when the majority of the nests hatch. The impacts are expected to be a result of the physical presence of troops, vehicles, watercraft, helicopter drops/extractions, live fire, inert mines or other obstacles on or near the beach during nighttime hours when nesting and hatchling emergence from nests predominately occur, causing female turtles to false crawl or abort the nesting process or be injured, or entrapped and hatchling turtles to be injured or entrapped as they emerge from the nest and crawl to the Gulf of Mexico. Testing and Training activities could affect the behavior of adult female sea turtles approaching the beach to select a suitable site to nest; hatchling sea turtles emerging from the nest and crawling to the Gulf of Mexico may become misoriented or disoriented from noise, human presence, obscurants, light, moving watercraft, aircraft, or vehicles.

The potential for *harassment* and *harm* to sea turtle nests, hatchlings, and adults would be reduced by avoidance and minimization measures described in Chapter 2 and by the limitation of the relocation area to the two miles of beach at the A-15 Designated Training Area and the A-13B LCAC corridor. However, testing and training activities on Eglin SRI property are **likely to adversely affect** sea turtles during sea turtle season. Testing and training activities occurring from 01 May through 31 October on Eglin SRI property could potentially *harass* and *harm* sea turtle nests, hatchlings and adults as shown in Tables 4-6 and 4-7.

Table 4-6. Annual Number of Sea Turtles Potentially Harassed by SRI Testing and Training Activities

Annually Impacted	Loggerhead	Green	Kemp's ²
Nests	19.21	9.35	1.0
Hatchlings ¹	2121.6	1291.4	110 ³
Adult Females	4.69	2.83	1

¹Assumes 100% survival² Potential take due to recent nesting trends³ USFWS, 2011 (No Eglin data available)**Table 4-7. Annual Number of Sea Turtles Potentially Harmed by SRI Testing and Training Activities**

Annually Impacted	Loggerhead	Green	Kemp's ²
Nests	2.26	1.1	1.0
Hatchlings ¹	249.73	151.77	110 ³
Adult Females	0.55	0.33	1

¹Assumes 100% survival² Potential take due to recent nesting trends³ USFWS, 2011 (No Eglin data available)

4.2.4 Piping Plover and Piping Plover Critical Habitat

Activities with the potential to impact piping plover and piping plover critical habitat include:

- S/A missile testing
- LCAC crossovers
- Ground testing
- Personnel/equipment drops and extractions
- Ground training
- Live fire
- Amphibious assaults

Piping plovers can be found foraging anywhere on Santa Rosa Island. All testing and training activities would avoid piping plover critical habitat therefore reducing potential impacts to

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plovers. However, helicopter and low-level aircraft activities, live fire, S/A missile launches, amphibious and land-based activities outside of critical habitat may result in a startle effect to plovers near the area and could temporarily interfere with foraging activities. In these situations, noise associated with the testing and training activities would likely temporarily flush the birds from the area, possibly causing stress and extra caloric expenditure, but birds would be expected to simply move on to undisturbed foraging areas during the course of the activity. Because disturbance would be temporary and localized in nature, these activities would cause minimal harassment to piping plovers and no direct impacts are expected. Avoidance and minimization measures listed in Chapter 2 would apply, which include:

- All activities are prohibited within piping plover designated critical habitat (if designated critical habitat cannot be avoided, a separate Section 7 consultation would be required)
- Piping plover designated critical habitat is marked with “Endangered Species” signs
- During the period from mid-July through mid-May, personnel/equipment drops and extractions should avoid known piping plover feeding areas
- Live fire would be directed away from piping plover designated critical habitat
- Live fire buffer zones around known piping plover designated critical habitat would be established (e.g., 150 meters for frangible munitions, 2,000 meters for standard munitions)
- Live fire would be directed toward the Gulf

With the implementation of the avoidance and minimization measures in Chapter 2, testing and training activities are **not likely to adversely affect piping plover** and there would be **no effect** to piping plover designated critical habitat.

4.2.5 *Cladonia Perforata*

Activities with the potential to impact *Cladonia* include:

- S/A missile testing
- LCAC crossovers
- Ground testing
- Personnel/equipment drops and extractions
- Ground training

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- Amphibious assaults

The main threat to *Cladonia* from testing and training activities is trampling of the lichen and introduction of invasive species. *Cladonia* locations are fenced off and marked with “Endangered Species” signs; testing and training activities will be prohibited within these areas. Invasive non-native plant species have been documented at multiple locations on Santa Rosa Island. Certain management practices can reduce the spread of invasive plants associated with operational activities. The main practices include: restricting vehicle/equipment access in untreated areas with known invasive plant problems, washing vehicles/equipment before transport onto the island, and designating access corridors from roads to beach and periodically monitoring these corridors for invasive species. Additionally, it is important to keep vehicles on established roads when possible. Avoidance and minimization measures listed in Chapter 2 would apply, which include:

- All activities are prohibited within *Cladonia* habitat (if habitat cannot be avoided, a separate Section 7 consultation would be required)
- Locations of *Cladonia* colonies would be fenced off and marked with “Endangered Species” signs
- Vehicle/equipment access would be restricted in untreated areas with known invasive plant problems
- When possible, vehicles/equipment would be washed before transport onto the island
- Designated access corridors from roads to beach would be periodically monitored for invasive species

With the implementation of avoidance and minimization measures in Chapter 2, testing and training activities are **not likely to adversely affect** *Cladonia*.

4.2.6 Shorebirds

Activities with the potential to impact sensitive shorebirds include:

- S/A missile testing
- LCAC crossovers
- Ground testing
- Personnel/equipment drops and extractions

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- Ground training
- Live fire
- Amphibious assaults

Colonies or individual nests of several state-listed shorebird species (i.e. least terns, snowy plovers, and black skimmers) are known to nest on Santa Rosa Island and have the potential to occur within testing and training areas. Helicopter and low-level aircraft activities, live fire, S/A missile launches, amphibious and land-based activities near shorebird nesting areas may result in a flush/startle response. During nesting season, this may result in a potential increased vulnerability of eggs and chicks to predation. However, foraging species would typically move on to other areas, while nesting species would return after the general disturbance was over. These activities would also likely scare other species such as predators (e.g., feral cats, coyotes, etc.) from the area, thus reducing the chances of nest predation should nesting birds be flushed. To avoid impacts to shorebirds, it would be preferable to avoid known nesting areas during nesting season (01 March to 31 August) to minimize negative impacts to eggs and chicks. Avoidance and minimization measures listed in Chapter 2 would apply, which include:

- Shorebird surveys and monitoring are routinely conducted by Eglin Natural Resource personnel during the nesting season, but these surveys are not comprehensive and all nests may not be located. Therefore, NRS approved personnel would conduct a pre-mission survey for nesting shorebirds during the nesting season (01 March to 31 August).
- A-15 Designated Training Area would be primary site for ground training activities.
- If any nests or colonies of shorebirds are found within the testing or training area, the nest(s) or colonies would be clearly marked and avoided. A reasonable buffer would be established to protect the nest from disturbance.

With the implementation of avoidance and minimization measures in Chapter 2, testing and training activities are **not likely to adversely affect** shorebirds.

4.2.7 Santa Rosa Beach Mouse

Activities with the potential to impact the Santa Rosa Beach Mouse include:

- S/A missile testing
- LCAC crossovers

- Ground testing
- Personnel/equipment drops and extractions
- Ground training
- Live fire
- Amphibious assaults

Potential for direct impacts to the Santa Rosa beach mouse from testing and training activities is extremely low due to the fact that beach mice tend to spend much of their time in burrows that they excavate in the dunes. However, amphibious and land-based activities that take place within the sand dunes do have the potential to disturb beach mouse habitat, but the risk of this is relatively low since these types of activities are limited in dune areas. Established dunes and vegetated areas are to be avoided because they function as habitat for beach mice, providing food and shelter. Damage to the vegetation may not only decrease its value as habitat, but can expose the underlying sand to wind and storms that eventually modify the entire dune by erosion. Vehicles and troops are expected to avoid dunes that are greater than five feet high. This measure would substantially reduce potential impacts to beach mice and their burrows. Reproduction peaks are in winter months; therefore minimization of testing and training activities would be preferable during this period. Also, because beach mice are mostly nocturnal, a minimization of nighttime activities would be preferred. Avoidance and minimization measures listed in Chapter 2 would apply, which include:

- Avoidance of vegetated dune habitat and dunes 5 ft or higher by training/mission activities

With the implementation of avoidance and minimization measures in Chapter 2, testing and training activities are **not likely to adversely affect** Santa Rosa beach mice.

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5. CONCLUSION


The Proposed Action has varying potential impacts based on the scope of activities and relation to species and species habitat. To mitigate these potential impacts, Eglin AFB would adhere to avoidance and minimization measures listed in Chapter 2. Testing and training activities on Santa Rosa Island are **not likely to adversely affect** the piping plover or its designated critical habitat, *Cladonia perforata*, shorebirds, or the Santa Rosa beach mouse. Sea turtles are **likely to be adversely affected** by testing and training activities. Avoidance and minimization measures, to include clearance procedures prior to testing and training activities, would serve to reduce potential impacts to sea turtle nests, hatchlings, and adults.


Eglin AFB would notify the USFWS immediately if it modifies any of the actions considered in this Proposed Action or if additional information on listed species becomes available, as the USFWS may require a reinitiation of consultation. If any impacts to listed species occurs beyond what Eglin has considered in this assessment, all operations would cease and Eglin would notify the USFWS. Prior to commencement of activities, Eglin would implement any modifications or conditions resulting from consultation with the USFWS. Eglin NRS believes this fulfills all requirements of the ESA.

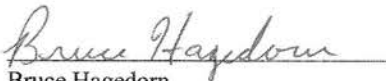
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6. SIGNATURES

FORMAL CONSULTATION REGARDING
IMPACTS TO FEDERALLY LISTED SPECIES ON SANTA ROSA ISLAND
FROM TESTING AND TRAINING ACTIVITIES
EGLIN AIR FORCE BASE, FLORIDA

Prepared by:  9/29/11
Kelly Knight
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SAIC
Date

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Bob Miller
Endangered Species Biologist
Eglin Natural Resources Section
Date

 9/29/11
Bruce Hagedorn
Chief, Wildlife Element
Eglin Natural Resources Section
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 9/30/11
Stephen M. Seiber
Chief, Eglin Natural Resources Section
Date

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APPENDIX A

MILITARY TESTING AND TRAINING ACTIVITIES

This Appendix contains detailed descriptions of testing and training activities from the Range Environmental Assessment for Santa Rosa Island. All referenced figures in this Appendix can be found in the Environmental Assessment.

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Appendix A

Military Testing and Training and Other Land Use Activities

1 SRI CURRENT MISSION AND LAND USE DESCRIPTIONS

2 Santa Rosa Island (SRI) provides a unique environment for military operations, affording access
 3 to diverse geographic features and the littoral zone. Local units that routinely utilize SRI
 4 include, but are not limited to, 7 Special Forces Group (Airborne) (7SFG(A)), HAVE ACE, 1
 5 Special Operations Wing (1 SOW), 720 Special Tactics Group (STG), STTG, 6 Ranger Training
 6 Battalion (6RTB), 23 Special Tactics Squadron (STS), 14 Weapons Instructor Course (WIC),
 7 and 342 Training Squadron Detachment (TRS). Other units deployed temporarily to Eglin or
 8 Hurlburt also conduct missions at SRI. These units include US Army SF and Rangers, US Navy
 9 Special Boat Team (SBT) and Sea-Air-Land Teams (SEAL), US Air Force Combat Control
 10 Team (CCT) and Tactical Air Control Party (TACP), US Marine Corps Special Operations
 11 Forces (MARSOF), and allied foreign Special Operations Forces (SOF).

12
 13 Missions of various types are conducted on SRI almost daily. All participating mission
 14 personnel abide by the rules and regulations for environmentally and culturally sensitive areas.
 15 The vast majority of missions are conducted in the area of A-15. This area has been under
 16 development for a number of years to support special operations mission sets. A-15 maintains a
 17 number of helicopter landing zones (HLZs) and buildings suitable for DA missions. For these
 18 reasons, and due to the restricted nature of SRI and A-15, it allows SOF personnel to train with
 19 multiple partnering forces and airborne assets in a secluded setting. Although A-15 is a primary
 20 area, A-7, A-10, A-11, and A-13 are also active training areas.

21
 22 Many, but not all, missions conducted on SRI involve SOF personnel. The SOF battle plan
 23 involves the execution of small, quiet, stealthy, leave-no-trail operations. An ODA Team is
 24 usually a 12-person unit, with 1 or 2 additional personnel possibly present if being evaluated.
 25 There may be more than one team in place for a training mission, but even under such a scenario,
 26 the mission is not considered a major amphibious landing/attack training event involving
 27 hundreds of personnel. Training events consist of any number of specific tasks employing
 28 multiple means to accomplish them. Teams may arrive and depart SRI by multiple conveyances
 29 appropriate to the training task, including ground, air, and water transport. For shoreline
 30 operations, BLS areas as identified in this document are utilized for small boat operations to infil
 31 or exfil teams executing training events. Teams come ashore via small boat, and once on shore
 32 they proceed inland to conduct their mission. In most instances, during the infil and exfil phases,
 33 teams are on the beach area only long enough to prepare for the mission. During dive training
 34 events, teams conduct training up to 1,000 meters offshore in the Gulf of Mexico (GOM), and on
 35 the water's edge of the beach area. They may do multiple iterations of swimming/diving to and
 36 from the shore and the boat

37
 38 For air assault SOF missions, helicopters are utilized depending on availability and mission need.
 39 Personnel and equipment are delivered or extracted at an HLZ by either landing, or using an
 40 alternate system such as FRIES or fast ropes. Rope methods are used at HLZs, but also at other
 41 unimproved sites where the aircraft cannot land, or where speed of the mission dictates an
 42 expedient insertion or recovery. Insertion and extraction by vehicle is still the predominant
 43 method. Trucks, HUMVEE, bus, or car are all possible conveyances.

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Appendix A

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1 Once on shore/site, teams will maneuver on the ground to conduct DA, CSAR, or RECON type
 2 missions. Teams will incorporate information on culturally and environmentally sensitive areas,
 3 as provided by 96 CEG/CEV, when planning routes for ground maneuver actions to and from
 4 objective sites. An example would be inserting a team at A-13 that would then maneuver to A-
 5 15, conduct DA missions, then maneuver to A-17 for extraction. All maneuvers would take
 6 place through approved areas. The DA, RECON and CSAR missions involve small arms
 7 munitions in the form of blanks and simulators. In rare cases, live fire may be conducted. Also
 8 in use are ground burst simulators and small amounts of C-4/det cord required to dislodge doors
 9 from their frames. Specific structures are in place at A-15 to support these door breaching
 10 activities. Live rounds are not authorized on SRI.

11
 12 Due to the ongoing training at A-15, and the sometimes immediate need for a specific event, the
 13 Gulf side of A-15 needs to be available on a near-continuous basis, without the need for
 14 regulatory consultation for each mission. A dedicated training area (shown as the ALRT Project
 15 Area in Figure 2-2 of the main text) is part of Alternative 2 (the Preferred Alternative) for this
 16 REA and is described in Section 2.2.3. Based on size and scope of training, and with the support
 17 of 96CEG/CEV, monitoring and marking this area when required would allow all required
 18 events to take place without negative impacts to cultural or natural resources.

19
 20 The following mission and land use descriptions provide information pertaining to activities that
 21 have been conducted within the SRI ROI. These activities are evaluated under the Preferred
 22 Alternative (Alternative 2) in Chapter 4. A terms and definitions section precedes the mission
 23 and land use sections.

24 25 **A.1 Terms and Definitions**

26
 27 Combat Control Team (CCT). [JP 1-02, JP 3-17] (DoD) A small task organized team of Air
 28 Force parachute and combat diver qualified personnel trained and equipped to rapidly establish
 29 and control drop, landing, and extraction zone air traffic in austere or hostile conditions. They
 30 survey and establish terminal airheads as well as provide guidance to aircraft for airlift
 31 operations. They provide command and control, and conduct reconnaissance, surveillance, and
 32 survey assessments of potential objective airfields or assault zones. They also can perform
 33 limited weather observations and removal of obstacles or unexploded ordnance with demolitions.
 34

35 Convoy Escort. [JP 1-02] (DoD, NATO) An aircraft in company with a convoy and responsible
 36 for its protection. Also, an escort to protect a convoy of vehicles from being scattered, destroyed,
 37 or captured
 38

39 Beach Landing Site (BLS). [JP 1-02] (DoD) A geographic location selected for across-the-beach
 40 infiltration, exfiltration, or resupply operations.
 41

42 Marine Corps Special Operations Forces (MARSOFF). [JP 1-02, JP 3-05.1] (DoD) Those Active
 43 Component Marine Corps forces designated by the Secretary of Defense that are specifically
 44 organized, trained, and equipped to conduct and support special operations.

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- 1 Personnel Recovery (PR). [JP 1-02] (DoD) The aggregation of military, civil, and political
 2 efforts to obtain the release or recovery of personnel from uncertain or hostile environments and
 3 denied areas whether they are captured, missing, or isolated. That includes US, allied, coalition,
 4 friendly military, or paramilitary, and others as designated by the National Command
 5 Authorities. PR is the umbrella term for operations that are focused on the task of recovering
 6 captured, missing, or isolated personnel from harm's way. PR includes, but is not limited to,
 7 theater search and rescue; combat search and rescue; search and rescue; survival, evasion,
 8 resistance, and escape; evasion and escape; and the coordination of negotiated as well as forcible
 9 recovery options. PR can occur through military action, action by nongovernmental
 10 organizations, other US Government-approved action, and/or diplomatic initiatives, or through
 11 any combination of these.
- 12
- 13 Rangers. [JP 1-02, JP 3-05.1] (DoD) US Army rapidly deployable airborne light infantry
 14 organized and trained to conduct highly complex joint direct action operations in coordination
 15 with or in support of other special operations units of all Services. Rangers also can execute
 16 direct action operations in support of conventional non-special operations missions conducted by
 17 a combatant commander and can operate as conventional light infantry when properly
 18 augmented with other elements of combined arms.
- 19
- 20 Sea-Air-Land (SEAL) Team. [JP 1-02, JP 3-05] (DoD) US Navy forces organized, trained, and
 21 equipped to conduct special operations in maritime, littoral, and riverine environments.
- 22
- 23 Search and Rescue (SAR). [JP 1-02] (DoD, NATO) The use of aircraft, surface craft,
 24 submarines, specialized rescue teams, and equipment to search for and rescue personnel in
 25 distress on land or at sea.
- 26
- 27 Special Boat Team (SBT). [JP 1-02, JP 3-05] (DoD) US Navy forces organized, trained, and
 28 equipped to conduct or support special operations with patrol boats or other combatant craft.
- 29
- 30 Special Forces (SF). [JP 1-02, JP 3-05] (DoD) US Army forces organized, trained, and equipped
 31 to conduct special operations with an emphasis on unconventional warfare capabilities.
- 32
- 33 Special Operations Forces (SOF). [JP 1-02, JP 3-05.1] (DoD) Those Active and Reserve
 34 Component forces of the Military Services designated by the Secretary of Defense and
 35 specifically organized, trained, and equipped to conduct and support special operations. Includes
 36 Special Operations personnel assigned to all branches of military service (Army, Navy, Air
 37 Force, and Marines).
- 38
- 39 Surveillance. [JP 1-02] (DoD, NATO) The systematic observation of aerospace, surface or
 40 subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other
 41 means
- 42
- 43 Tactical Air Control Party (TACP). [JP 1-02, JP 3-09.3] (DoD) A subordinate operational
 44 component of a tactical air control system designed to provide air liaison to land forces and for
 45 the control of aircraft.

Appendix A

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- 1 Reconnaissance. [JP 1-02] (DoD, NATO) A mission undertaken to obtain, by visual observation
 2 or other detection methods, information about the activities and resources of an enemy or
 3 potential enemy, or to secure data concerning the meteorological, hydrographic, or geographic
 4 characteristics of a particular area.
 5
- 6 FRIES: Fast rope infiltration/exfiltration/extraction system.
 7
- 8 Duck Drop: Zodiac type boats dropped from fixed/rotary wing aircraft into a body of water.
 9
- 10 Fast Rope Hoist: Extraction method employed by rotary wing aircraft. May be used anywhere
 11 personnel are on the ground and need to be removed.
 12
- 13 Urban Escort: Specific form of convoy escort. Involves at least one airframe
 14 coordinating/conducting escort protection measures for a ground asset transiting an urban area.
 15
- 16 Combat Search and Rescue (CSAR). Same as SAR, but in combat situation.
 17
- 18 Ground Maneuver: Movement of personnel from one point to another, usually from an infil point
 19 to an objective area, and then out to an extraction point.
 20
- 21 Infil/Exfil: Infiltration/Exfiltration by any means. Means can be on ground by vehicle, on water
 22 by boat or submarine, or by air with fixed or rotary wing asset.
 23
- 24 Small Boat Ops: Means to deliver/remove personnel to an objective area. Can be in large open
 25 waters, and also up rivers and streams. Boat is usually a rubber zodiac type with small outboard
 26 engines. Engines are modified to be very quiet.
 27
- 28 Dive Team: An ODA team whose specific task is scuba diving.
 29
- 30 Direct Action (DA). [JP 1-02, JP 3-05] (DoD) Short-duration strikes and other small-scale
 31 offensive actions conducted as a special operation in hostile, denied, or politically sensitive
 32 environments and which employ specialized military capabilities to seize, destroy, capture,
 33 exploit, recover, or damage designated targets. Direct action differs from conventional offensive
 34 actions in the level of physical and political risk, operational techniques, and the degree of
 35 discriminate and precise use of force to achieve specific objectives. A DA mission involves the
 36 direct planning and maneuvering to engage an enemy target with force, neutralize the threat, then
 37 exit the area, or hold the area for reinforcements.
 38
- 39 Operational Detachment Alpha (ODA) Team. A Special Forces unit consisting of 12 personnel
 40 trained on specific areas of warfare. There are mountain, dive, and HALO specialty teams. All
 41 teams are DA trained.
 42
- 43 Operational Detachment Bravo (ODB) Team. A team whose job is to provide logistical support
 44 to an ODA team.
 45
- 46 1 SOW: 1 Special Operations Wing

Appendix A

Military Testing and Training and Other Land Use Activities

- 1 6 RTB: 6 Ranger Training Battalion
 2
 3 STTS: Special Tactics Training Squadron
 4
 5 23 STS: 23 Special Tactics Squadron
 6
 7 14 WIC: 14 Weapons Instructor Course
 8
 9 342 TRS DET 3: 342 Training Squadron Detachment 3 (TACP school at Hurlburt Field).
 10
 11 720 STG: 720 Special Tactics Group
 12
 13 HAVE ACE: USSOCOM special operations school at Hurlburt Field. Includes SOF personnel
 14 from all military service branches.
 15
 16 GOMEX: Gulf of Mexico
 17
 18 OPFOR: Opposing Forces
 19
 20 HLZ: Helicopter Landing Zone

21 **A.2 MILITARY ACTIVITIES ON SANTA ROSA ISLAND**22 **Testing**

23 Air Operations Testing – Air operations that occur in the airspace above the SRI ROI are
 24 analyzed cumulatively within the *Overland Air Operations Programmatic Environmental*
 25 *Assessment* (U.S. Air Force, 1998). Air operations as part of the Open Air-Hardware in the Loop
 26 (OA-HITL) Tower Testing are included as part of this REA.
 27

28 Electronic Countermeasures (ECM) and Electronic Systems Testing - ECM testing evaluates an
 29 aircraft system's ability to defeat land, sea, or airborne threats. This provides training on how to
 30 combat electronic signals designed to degrade onboard equipment or confuse the operator and
 31 any "other" use of the airspace. ECM Training is routinely done aircraft against aircraft or
 32 aircraft against ground/surface ship systems. Any part of the Eglin Range Complex can be used
 33 for this type of training but it is mostly done over the water. Electronic Systems testing includes
 34 radar software testing, radios, radar cross section, and any electronic system other than ECM.
 35 These missions are generally flown at a low speed and moderate altitude (usually 5,000 to
 36 15,000 feet above ground level (AGL) but sometimes as low as 500 feet). SRI test facilities are
 37 usually involved in most of these activities.
 38

39 Surface to Air (S/A) Missile Testing – Surface-to-air missile tests launch missiles from a variety
 40 of locations, including D-3 (Cape San Blas), TA A-15 on SRI, and surface vessels, at target
 41 aircraft in the Eglin Gulf Test and Training Range (EGTTR). Missions of this type typically
 42 involve Theater Missile Defense (TMD) medium- and long-range missile systems, such as Air
 43 Intercept Missile (AIM) and PATRIOT missiles, fired from a High Mobility Multi-Purpose

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1 Wheeled Vehicle (HMMWV) at A-15. In 2002, an *Environmental Assessment for Projected*
 2 *Patriot Testing (Five-Year Plan)* (U.S. Air Force, 2002) was prepared to evaluate the potential
 3 impacts from conducting PATRIOT missile testing activities on SRI and interior portions of
 4 Eglin AFB over a 5-year period.

5
 6 OA-HITL Testing – The cornerstone of the OA-HITL testing effort is a 300-foot OA-HITL
 7 tower at Test Area A-13B and three focus test sites located at TA A-3, TA A-6, and TA A-17A.
 8 The tower has a Skypod and Shaker Table to support test/test support equipment. The focus sites
 9 would contain a 100-foot tower, a control facility, and several pads/hardstands. OA-HITL
 10 testing involves linking the tower to other facilities such as the Guide Weapons Evaluation
 11 Facility (GWEF) or Preflight Integration of Munitions and Electronic Systems (PRIMES)
 12 facilities, allowing for complete simulations from aircraft release through endgame. The tower is
 13 also used as a seeker/sensor platform for evaluating or data gathering on new or improved
 14 seeker/sensors. The test item or subject could be as close as the beach, the surf zone, or as far as
 15 30 miles out (line-of-sight) from the tower. The tower may also be used to test and evaluate
 16 Command, Control, Communications, Computers, Intelligence, and
 17 Surveillance/Reconnaissance Systems (C4ISR) systems through the same process of linking and
 18 simulations. This action was evaluated through the NEPA process in the *Environmental*
 19 *Assessment for Santa Rosa Island Reconstitution of Test Capabilities* (U.S. Air Force, 1998b).
 20 The 2005 SRI Mission Utilization Plan evaluated Expanded OA-HITL tower testing that
 21 included sensor testing with smoke and obscurants and the addition of a railroad track and
 22 turntable (U.S. Air Force, 2005).

23
 24 Airborne Littoral Reconnaissance Technologies, Including Coastal Battlefield Reconnaissance
 25 Analysis and Rapid Overt Airborne Reconnaissance Systems – A Biological Assessment (U.S.
 26 Air Force, 2008) and corresponding Biological Opinion (NMFS, 2008) were completed in 2008
 27 for Airborne Littoral Reconnaissance Technologies (ALRT) activities. The ALRT project
 28 consists of collecting signature data from both passive and active multispectral seeker/sensor
 29 signature data of obstacles, simulated mines, and barricades in inland environments and littoral
 30 waters from several possible systems and airframes. The sensors typically consist of passive
 31 multispectral receivers collecting imagery just as a video camera does, but some missions are
 32 active and have up to a Class IV laser illuminator. Simulated mines, barriers, and obstacles are
 33 set up on beach and inland areas, as well in as a separate specified marine area extending from
 34 the shore in waters as deep as 4 meters (13 feet) over an area 100 meters (328 feet) wide.

35
 36 Under the ALRT program, the 46 TS/OGEE assists Naval Surface Warfare Center Panama City
 37 Division (NSWC PCD) execute the Coastal Battlefield Reconnaissance Analysis (COBRA) and
 38 the Rapid Overt Airborne Reconnaissance (ROAR). The COBRA flight test missions take place
 39 over multiple ranges. Decision of the specific range to use is based on the layout that will
 40 optimize data collection and provide accurate scoring effectiveness of each test. The primary
 41 range on SRI for COBRA operations is performed on A-15. NSWC PCD assets used for the
 42 setup of A-15 include inert mines, concertina wire, hedgehogs, sea urchins, tangle foot, buoys,
 43 and concrete blocks. The purpose of the test is to verify the COBRA system is fully operational
 44 through a series of flight tests over littoral and in-land environments. The ROAR system uses
 45 the same test methodology as the COBRA test except the ROAR system has an active imager
 46 while COBRA has a passive imager. The methodology encompasses both ground tests and flight

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1 tests. Ground tests are performed by operating a truck on runways or on roads. The flight tests
2 use a civilian Bell UH-1. Littoral environmental tests are conducted over A-15. When testing at
3 A-15 is unavailable, tests are performed at the Navy Shallow Water Mines and Countermeasures
4 (SWMCM) Test Ponds on B-70.

5
6 During each 1- to 2-week testing series, multiple data-collection flights are conducted, typically
7 with two occurring per day. A Bell UH-1 "Huey" aircraft flies to Test Area A-15 to collect data.
8 The aircraft then lands on TA A-15 to refuel, download data, check systems, and tie down for the
9 night as required. The helicopter then takes off from Test Area A-15 for a subsequent data-
10 collection flight, then returns to the mainland or stays on Test Area A-15 upon mission
11 completion. Flights occur both day and night, with approximately 25 percent of missions
12 occurring at night between the hours of 2100 and midnight. Altitudes range from 152 to 914
13 meters (500 to 3,000 feet) for each sortie, with typical speeds from 35 to 70 knots (40 to 81 miles
14 per hour). Missions that do not require landing at Test Area A-15 stage out of local airports.

15
16 The typical system consists of the imaging sensor, optical illuminator image recording hardware,
17 navigation tracking software, mechanical cooling equipment for the illuminator, and the aircraft.
18 Lasers are enclosed in a light-tight enclosure with a mechanical shutter for stopping illumination
19 when not over target fields. In addition, a number of laser safety devices are incorporated into
20 the system to prevent inadvertent laser operation. Cameras record images of the target field. All
21 recording is annotated electronically and synchronized together with Global Positioning System
22 (GPS) time.

23
24 Each test series lasts 1 to 2 weeks. Personnel set up the target field over 3 to 4 days, the mission
25 flights commence, and then personnel remove the targets from the test site over 2 to 3 days.
26 ALRT missions could occur every few months; the estimate number of missions provided in the
27 Biological Assessment for the Advanced ALRT Project (U.S. Air Force, 2008) is four to five
28 times per year.

29
30 A typical mission scenario is as described below:

- 31 ● Three to four days: target set up and mission preparation
- 32 ● Four to six days: conduct mission flights
- 33 ● Two to four days: weather backup
- 34 ● Two to three days: target removal and cleanup

35
36 Activities associated with testing include placement of inert mines and obstacles (such as
37 concrete blocks and concertina wire) on the beach front. M20 antitank mines, PDM-1M
38 antitank/antiland craft mines, or other similar mines that are approximately 14 inches in
39 diameter, plus baseplate accessories as required, are used in the surf zone at 0.5-meter (1.64-foot)
40 depths. Barricades include concertina wire or wire rolls that could simulate concertina wire,
41 tanglefoot barbed wire fencing, and structural sea urchins, which are three pieces of steel rebar
42 welded in the shape of a teepee.

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Military Testing and Training and Other Land Use Activities

1 The minefield, barrier, and obstacle layouts required for this test include linear patterned and
 2 random scattered mines, barriers, and obstacles on the beach and in the water. These targets
 3 would be placed on the beach and in the surf zone. The obstacles and barricades would be no
 4 longer than 100 meters (328 feet); however, M20 inert antitank mines may be scattered around
 5 the other items but would be located within the potential placement locations. To minimize the
 6 movement or loss of mines, each individual target is anchored, tied together, inventoried, and
 7 monitored for proper setup. These devices are positioned near the edge of the water or in the
 8 water up to 4 meters (13 feet) deep and anchored primarily with screw anchors or, occasionally,
 9 poles jettied into the sand. To raise and lower some of the heavier targets, a boat/barge with
 10 equipment is necessary. A scuba diver secures each mine with a screw anchor.

11
 12 The array remains in place at night, with reflective buoys marking the area to keep boat traffic
 13 out. As soon as the last flight test is complete, personnel remove all of the mines, obstacles, and
 14 barricades and account for their locations.

15
 16 Small Boat Obscurant Testing – This type of testing led by the Navy involves using an obscurant
 17 system for small combatant watercraft. The Navy tests against certain operational scenarios,
 18 utilizing SRI beachfront as it has the instrumentation capabilities and test area requirements
 19 necessary to conduct these tests. This type of testing of infrared and obscurant screening along
 20 the beachfront is of interest to the Special Operations community and to the Army for beach
 21 assault or counterinsurgency tactics. The obscurant system uses standard Army smoke grenades
 22 to provide screening against visible and infrared threat systems. The grenades would be
 23 launched onshore and several hundred meters offshore. Sites designated for obscurant testing on
 24 SRI included A11, A13, A13A, and A15.

25
 26 LCAC Training and Weapons Testing - The Landing Craft Air Cushion (LCAC) is a high-speed
 27 fully amphibious landing craft capable of traveling over both land and water, providing transition
 28 over the land-water interface. The LCAC is also used in the neutralization of beach obstacles
 29 and hostile watercraft, with testing/training activities typically involving live/inert testing of
 30 various firing mechanisms in concert with travel through the land-water interface and across
 31 beach environments. The 2005 SRI Mission Utilization Plan (U.S. Air Force, 2005) addressed
 32 Expanded LCAC Training/Maneuver Areas and designated specific LCAC crossover areas on
 33 SRI. Expanded LCAC activities involve the increased use of the LCAC for both inert training
 34 activities and live fire testing and training. Live fire activities consist of live 30 mm rounds fired
 35 at targets in the direction of the Gulf of Mexico. Live fire missions are uncommon and would be
 36 evaluated on a case-by-case basis through the Air Force 813 process. Under the 2005 plan,
 37 LCACs would utilize specific areas for crossing from the Gulf to Santa Rosa Sound and vice
 38 versa and for the use of firing weapon systems. The areas designated for LCAC crossovers in
 39 the 2005 SRI Mission Utilization Plan are located west of Test Area A-3, west of Test Area A-6,
 40 two areas between Test Area A-13A and A-15, and east of Test Area A-17. LCAC testing has
 41 not occurred on SRI since 2003, when a joint exercise between the U.S. Navy and the U.S.
 42 Marines was conducted and analyzed in the *Amphibious Ready Group/Marine Expeditionary
 43 Unit (ARG/MEU) Readiness Training Environmental Assessment* (which includes the associated
 44 USFWS and NMFS Biological Assessments) (U.S. Air Force, 2003). The Preferred Alternative
 45 of this document would eliminate all LCAC crossover corridors except the one located near A-
 46 13B (Figure 2-2).

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1 Ground Testing - Ground testing mainly involves land-based activities associated with
 2 supporting littoral warfare programs, which include shallow-water mine detection testing and
 3 mine obstruction clearance testing. Ground testing may also involve the setup and testing of
 4 equipment on the beach to evaluate performance in high humidity beach environments.
 5 Obscurants may also be used during ground testing. Such activities have been evaluated in the
 6 *Littoral Assessment of Mine Burial Signatures (LAMBS) Biological Assessment* (U.S. Air Force,
 7 2002b), the *Environmental Assessment for Joint Biological Point Detection System (JBPDS) at*
 8 *Multiple Test Ranges* (U.S. Air Force, 2003a), and the *Biological Assessment for Airborne*
 9 *Littoral Reconnaissance Technologies (ALRT) Project* (U.S. Air Force, 2004).

10
 11 JFPASS Technical Demonstration-1 - As part of the Technical Demonstration-1 (TD-1)
 12 Execution Concept, Team JFPASS performs several activities on Santa Rosa Island. The first
 13 activity performed on SRI by Team JFPASS includes deploying, setting up, and validating the
 14 integration and technical readiness of the Force Protection (FP) security system at A-17. The
 15 second activity performed by Team JFPASS on SRI includes training and practicing base
 16 defense operations. Tactical base defense operations are conducted in two phases. During Phase
 17 I, Team JFPASS provides radar and camera surveillance at site A-17 in a semi-fixed
 18 site/expeditionary operational environment. During Phase 2, Team JFPASS defends a portion of
 19 site A-17 in an austere expeditionary operational environment. The types of technology used
 20 during these two phase include: MIUW marine surface radar with camera; 3eTI Military Wi-Fi;
 21 STS-1400 Ground Surveillance Radar with Camera; MDARS Unmanned Ground Vehicle;
 22 Networked Remote Operated Weapon System (NROWS); BAIS intrusion sensors.

23
 24 Pacific Sail Program - The SPAWAR Division of the Navy collects data on laser operations in a
 25 marine/littoral environment using test lasers (MATS system) and support equipment on A-15A
 26 in support for the Pacific Sail Program. Assets used include a laser backstop, target, and
 27 instrumentation set up on top of the 300 foot tower. The test team and equipment stay on the
 28 existing roads and hard surfaces at A-15A. Three laser lines illuminate a fixed target on the
 29 300-foot island tower and airborne targets flying within W-151A over water and 2914A over the
 30 western Eglin Range. The laser lines used are 532 nm, 775 nm, and 1567 nm. Laser
 31 illumination is performed from ground to air. The testing period occurs over a 30-day period.

32
 33 Joint Biological Standoff Detection System - The U.S. Air Force conducts Joint Biological
 34 Standoff Detection System production verification testing at SRI (A-15). Testing occurs over a
 35 6-day period from 0000 to 1200. The JBSDS equipment uses Light Detection and Ranging
 36 (LIDAR) technology with infrared and ultraviolet lasers to detect and discriminate biological
 37 aerosol clouds up to 5 km away. The same systems used during previous testing will be used
 38 during this phase of testing. Simulants used during the test include: 150 grams (g) of bacterial
 39 spore agents (BG) and 5 L of BG wet; 16 L of viral agents (MS2); 240 g protein toxins (OV);
 40 480 g of bacterium (BTK); 16 L plant pathogens (EH). The testing was evaluated in the
 41 *Environmental Assessment for Joint Biological Point Detection System (JBPDS) at Multiple test*
 42 *Ranges, Eglin Air Force Base, Florida* (U.S. Air Force, 2003a).

43
 44 Simulants are disseminated to create an aerosol cloud using sprayers and blowers are released
 45 from a boat located off-shore out to a maximum distance of 5 km from the detectors. Interferents
 46 will be produced during the missions to test system performance in the presence of smoke. A

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1 point source of smoke will be produced by burning brush/wood/hay/pine straw, and/or by using
 2 smoke grenades. Operating safety procedures will be IAW the test plan and the Eglin Test
 3 Directive Safety Appendix. All nonessential personnel are evacuated from the laser hazard area.
 4 Personnel inside the laser NOHD use approved laser protection goggles. Management
 5 requirements for turtle season are implemented to include restricting personnel from the beach,
 6 staying on established test sites, keeping lighting to a minimum, not shining lights toward the
 7 Gulf, and coordinating with Jackson Guard daily to ensure any turtle nests are identified and
 8 protected.

9
 10 Tactical Radio Test Support - The RT-1944/U multiband network radio is designed to
 11 communicate high-volume sensor data from multiple Navy platforms to system operators to
 12 distant tactical ships including the LCS. The RT-1944 is under consideration as a replacement
 13 transceiver for the current AN/VRC-99B radio system. There are two purposes of the test. The
 14 first is to verify that the RT-1944/U meets the Capability Development Document (CDD) for
 15 Littoral Combat Ship Flight 0+ requirement to operate four off-board systems simultaneously.
 16 The second purpose is to verify the ability of the RT-1944/U to simultaneously pass such data
 17 from multiple MIW unmanned surface systems to a simulated LCS command station.

18
 19 Test missions performed at SRI include a RT-1944/U base station and a radio network utility
 20 tester (R-NUT) located at previously improved ground or existing facilities at TA A-15 in order
 21 to simulate an LCS mounted base station. The radio antenna will be mounted on a 51-foot
 22 mobile tower located on an existing pad at TA A-15. The systems operating in the Gulf of
 23 Mexico will be one Common Unmanned Surface Vessel (CUSV), one Eglin AFB Rigid Hull
 24 Inflatable Boat (RHIB) acting as both a chase boat and as a simulated CUSV (test boat 3), two
 25 chartered fishing boats simulating Remote Multi-Mission Vessels (RMMV), and a Navy
 26 AeroStar UAV acting as a radio relay. The AeroStar UAV will take-off and land at TA B-12
 27 with flights into W-151A1 airspace. The CUSV control station and an AeroStar UAV additional
 28 control station will be located in an existing blockhouse at A-15.

29
 30 Littoral Combat Ship (LCS) Precision Attack Missile (PAM) Captive Seeker Flights - The
 31 Navy's LCS program includes 7 days of signature collection missions to support modeling and
 32 simulation development for the PAM. An Army UH-1 helicopter with a PAM seeker installed
 33 will be flying captive missions against a variety manned surface vessels in the Gulf of Mexico.
 34 The Army UH-1 helicopter will operate out of Test Site A-15. UH-1 flights will initiate and end
 35 on A-15A Test Pad 1. The UH-1 will be stored in the High Bay (facility 12555) after each
 36 mission and be refueled by Eglin trucks daily while on the Test Pad 1. One of the mission days
 37 will also include a Navy SH-60 helicopter which will provide laser designation of the surface
 38 targets.

39 Training

40 Training missions or activities are designed to teach, maintain, or increase operational
 41 proficiency. Training is divided into categories, and in some cases levels within these categories.
 42 The major training categories occurring within the SRI ROI are described below.

43
 44 Personnel/Equipment Drops and Extractions - Special Operations and the Army Ranger School
 45 routinely drop personnel and equipment into the water or on land either at low altitude (no

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Appendix A

Military Testing and Training and Other Land Use Activities

1 parachutes used) or high altitude (parachutes used). This activity typically uses W-151S (S =
 2 Shoreline) with occasional “over the horizon” drops in other sections of W-151 or any one of the
 3 numerous land drop zones or test areas. The typical drop is three to five personnel at a height of
 4 5 to 2,000 feet above the surface. During certain operations, there will also be personnel
 5 helicopter extractions, which require short duration helicopter landings on SRI. Similar activities
 6 involving low-flying helicopters and personnel traversing the Gulf in small watercraft were
 7 assessed in the *ARG/MEU Readiness Training Environmental Assessment* (which includes the
 8 associated USFWS and NMFS Biological Assessments) (U.S. Air Force, 2003), *U.S. Army*
 9 *Ranger Los Banos Training Biological Assessment* (U.S. Air Force, 2003b), and *Advanced Skills*
 10 *Training Program Biological Assessment* (U.S. Air Force, 2003c).

11
 12 Ground Training Operations - Ground training operations mainly fall under two categories:
 13 maneuvers and static training. Maneuvers involve many armed forces schools such as the Army
 14 Ranger Training Battalion School, Explosive Ordnance Disposal School, etc., which routinely
 15 deploy to most areas throughout the Eglin Range Complex for in-field training. Activities
 16 involve movements of troops and vehicles throughout the designated training area. SRI is used
 17 for beach assault training and other forms of clandestine operations using small-arms blank
 18 ammunitions. Similar activities have been evaluated under the ARG/MEU EA and USFWS
 19 consultation (U.S. Air Force, 2003). Additional activities involving Advanced Skills Training
 20 and Ranger Training have also recently undergone ESA Section 7 consultation with the USFWS
 21 (U.S. Air Force, 2003b and 2003c). Survival training routinely uses boats for water survival and
 22 parasail training.

23 Static ground training operations usually involve stationary exercises such as communication
 24 system training, bivouacking, or establishing a command center or triage. Similar activities were
 25 assessed in the *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force,
 26 2003).

27
 28 Live Fire – Live fire operations were addressed in the Estuarine and Riverine Areas Final
 29 Programmatic Environmental Assessment (U.S. Air Force, 2004a). Although analyzed, live fire
 30 activities currently are not conducted on SRI. Live fire operations would generally involve
 31 small-caliber weapons between 5.56-mm and .50-caliber fired in a seaward direction only. If
 32 available, soldiers would use frangible munitions with a 200-meter range or those of nonlead
 33 composition (i.e., tungsten) to reduce or eliminate potential environmental and safety concerns.
 34 Larger-caliber weapons such as the 30 mm could potentially be used on an intermittent basis,
 35 such as with LCAC operations on a mission-specific, case-by-case basis approved through the
 36 AFF 813 process.

37
 38 The SRI live fire range would be a designated area a maximum of one mile in width extending
 39 from the Gulf side of SRI to the Sound side, and located near Test Site A-13B (Figure 2-1). This
 40 range would enable Special Operations Forces (SOF) to conduct hot insert/extraction and “break
 41 contact” training drills using boats and/or swimmers in a coastal beach environment. The
 42 frequency of use would be biweekly. Guards posted in bunkers flanking the east-west bounds of
 43 the range would call a cease-fire in the event of a boat or aircraft entering the firing fan.

44
 45 Some live fire capability exists within the SRI and Santa Rosa Sound airspace. The airspace has
 46 an established controlled firing area, previously used during a live fire LCAC test. During this

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Appendix A

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1 test, an LCAC positioned in Santa Rosa Sound fired 30-mm rounds at targets on SRI and in the
 2 direction of the Gulf of Mexico.
 3

4 The general mission requirements would include transit by boat to an approved live fire site,
 5 where trainees could engage in fixed or pop-up targets. The live fire engagement scenario would
 6 last approximately 30 minutes, while the actual firing duration would be on the order of two or
 7 three minutes, after which troops would move ashore to capture an objective. In addition to
 8 inflatable boats, larger boats such as the Mark 5 would also be potentially employed. The
 9 Mark 5 is 81 feet long and highly maneuverable and can achieve speeds of 51 knots. Mark 5
 10 guns include either a GAU-19 or a GAU-13, similar to the gun that fired the 30 mm in a previous
 11 LCAC test mission. Rounds fired would potentially include 20 mm, 30 mm, 40 mm and
 12 small-caliber munitions from 5.56 mm to .50 cal. High explosive rounds would not be used;
 13 practice rounds would be employed.
 14

15 Expanded Special Operations Training - Special Operations and U.S. Marines have a need to
 16 train for covert beach landings and assaults. These groups usually use five to 15 personnel with
 17 small rubber boats. They are dropped off approximately 15 miles from shore (over the horizon)
 18 to navigate in and make a covert landing and assault or capture a designated target on SRI.
 19 There are other Special Forces Units from around the country and units from foreign countries
 20 that also need this training. The U.S. Air Force Special Operations Command at Hurlburt serves
 21 as the host for such training. The Navy is also a user of SRI for special operations training
 22 exercises. Similar types of activities have been evaluated in the *ARG/MEU Readiness Training*
 23 *Environmental Assessment* (U.S. Air Force, 2003). The 2005 SRI Mission Utilization Plan (U.S.
 24 Air Force, 2005) designated the majority of SRI for Expanded Special Ops Training. An area of
 25 SRI approximately 0.5 miles east of Test Area A-6 to approximately 1 mile west of
 26 Test Area A-3 was not included.
 27

28 Amphibious Assaults – The Marine Corps uses SRI to perform amphibious assault exercises.
 29 These activities typically involve a coordinated mission utilizing large landing craft, such as
 30 AAVs and LCACs, varying numbers of troops and personnel, and aircraft for cover. Landing
 31 craft and personnel are “dropped off” several miles or several thousand yards offshore and
 32 traverse to the island. Upon reaching SRI, the assault force breaches the shoreline, sets up a
 33 perimeter or staging area, and either proceeds to an objective or remains on site. The *ARG/MEU*
 34 *Readiness Training Environmental Assessment* (U.S. Air Force, 2003c) discusses these activities.
 35

36 U.S. Army Rangers Los Banos Training – A biological assessment and corresponding biological
 37 opinion (U.S. Air Force, 2003 and U.S. Fish and Wildlife Service, 2003) was completed in 2003
 38 to address U.S. Army Rangers Los Banos Training activities on SRI. As described in the
 39 Biological Assessment (U.S. Air Force, 2003b), the 6th Army Ranger Training Battalion (6 RTB)
 40 conducts Operation Los Banos Training on SRI approximately once per month, with a maximum
 41 of 24 days per year. The training is conducted on Friday nights, with instructors typically
 42 surveying the operation area and objective sites 1 to 2 days in advance of the mission. Each
 43 6 RTB class consists of 2 to 6 platoons, with up to 46 people in each platoon. Therefore, a
 44 maximum of 276 troops may participate in each training exercise. All activities are located
 45 between Test Areas A-10 and A-18 and target specific objective sites (Figure A-1). The

Appendix A

Military Testing and Training and Other Land Use Activities

1 operation can be divided into three main segments: Infiltrate (INFIL), Objective Assault, and
 2 Exfiltrate (EXFIL).

3
 4 *INFIL:* Training exercises begin at approximately midnight. Rangers usually deploy from
 5 Wynnhaven Beach and paddle across Santa Rosa Sound to designated drop sites. Personnel then
 6 walk to the objective sites via corridors through the northern side of SRI. Movement may occur
 7 on roads, across cleared areas, and through dune environments. In some cases, Rangers may
 8 deploy from the western boundary of Eglin’s property and move to their objectives by vehicle or
 9 on foot.

10
 11 *Objective Assault:* Small-scale assault training is conducted on objectives, using small arms
 12 blank ammunitions. The objective sites vary, but usually consist of small buildings. Personnel
 13 use the training to maintain and increase proficiency in weapons use.

14
 15 *EXFIL:* When the assaults are complete, personnel consolidate and walk down the beach or road
 16 in wedge formation. Exit from the island occurs via helicopter or vehicle. Currently, helicopters
 17 are not being used due to potential damage caused by sand.



18 **Figure A-1. Los Banos Training Sites**

19 Advanced Skills Training – A biological assessment (U.S. Air Force, 2003c) and corresponding
 20 biological opinion (USFWS, 2004) were completed to address Advanced Skills Training (AST)

Appendix A

Military Testing and Training and Other Land Use Activities

1 exercises on SRI. AST specializes in unconventional missions where troops assemble air
2 navigation and communication sites. Deploying by air, land, or sea on missions within enemy
3 territory, AST troops establish "assault zones" functioning as parachute drop zones, helicopter or
4 fixed wing landing zones, or extraction zones for low altitude resupply missions. They establish
5 "recovery zones," which are used for surface-to-air recovery of personnel or equipment, or
6 ground-based fire control for fixed wing, rotary wing, and AC-130 gunships. AST exercises on
7 SRI include INFIL/EXFIL, ground maneuvers, special tactics training events, and boat
8 operations. AST events may occur a few days per week near A-15. A brief description of each
9 is provided below:
10

11 *INFIL/EXFIL:* These events consist of a special tactics team being rapidly deployed (INFIL)
12 into nearshore waters by helicopter or small boats (Zodiacs) and coming ashore. EXFIL of the
13 area will be by helicopter or small boats. Special tactics teams are composed of up to
14 24 personnel per team (normal composition is 3 to 7 personnel). After INFIL, troops would
15 come ashore across from A-13 and A-15 in Santa Rosa Sound via approved waterborne
16 infiltration methods. INFIL from the Gulf (as opposed to Santa Rosa Sound) would occur no
17 more than once per quarter (four times per year). When they reach the beach, personnel will
18 carry the boats across the beach into the dunes and leave them for no more than 48 hours. Time
19 on the beach would be a matter of minutes. These forces would move to a designated site (A-10,
20 A-11, A-13, or A-15) on the island and perform Special Tactics Training Events (described in
21 detail below) for up to 48 hours. The duration of the INFIL/EXFIL exercise is less than 1 hour
22 and would occur up to 50 times per year.
23

24 *Ground Movement:* Ground movement involves the movement of wheeled vehicles and troops
25 on foot from landing sites to objective areas, from objective area to objective area, and from
26 objective areas back to landing sites. The majority of ground movement involves walking;
27 however, wheeled vehicles such as all-terrain vehicles (ATVs), motorcycles, high mobility
28 multipurpose wheeled vehicles (HMMWVs), and rescue all terrain transport (RAT) are used.
29 Wheeled vehicle traffic is minimal and remains on established range roads. No vehicles are used
30 on the beach or in the dunes. AST uses HMMWVs around landing zones (LZs) and drop zones
31 (DZs) to set up support equipment. On SRI, Test Areas A-10, A-11, and A-13 are utilized to
32 conduct ground movement operations. Ground movement operations generally last for 1 to
33 8 hours and could occur up to 365 days per year.
34

35 *Boat Operations:* Boat operations, Self Contained Underwater Breathing Apparatus (SCUBA)
36 diving, and navigation training will be conducted in the Santa Rosa Sound across from Test
37 Areas A-10, A-11, A-13, and A-15 via an administrative safety boat. The simulated training will
38 maintain proficiency in approved waterborne infiltration methods, navigation, and procedures
39 currently utilized by special tactics and special operation forces components. The AST
40 organization will provide a safety boat and medical personnel. Personnel may deploy from a
41 dock (north side of A-10) for missions in the sound. They will also traverse the sound from an
42 amphibious infiltration to A-13 for ground ops (overland and bivouac ops). Once per quarter the
43 waterborne ops will transition from the Gulf of Mexico to amphibious infiltration to the beach
44 area followed by overland operations to conduct reconnaissance and surveillance (R&S)
45 missions. Boat operations would occur for a duration of 1 to 48 hours with a maximum of

Appendix A

Military Testing and Training and Other Land Use Activities

1 50 events occurring per year under the No Action Alternative. The number of boat operations
2 could increase under Alternatives 1 and 2.

3 *Special Tactics Training Events:* Special tactics teams employ via overland methods to conduct
4 R&S. R&S is a mission undertaken either to obtain, by visual observation or other detection
5 methods, information about the activities and resources of an actual or potential enemy or to
6 secure data concerning the meteorological, hydrographical, or geographical characteristics of a
7 particular area. The special tactics teams establish an observation point and remain for up to
8 48 hours. R&S missions are clandestine in nature and no debris is left behind. During special
9 tactics training events on SRI, SCUBA diving operations are conducted over a 2-day period once
10 every 3 months at TA A-1. Diving consists of approximately 15-20 personnel entering the water
11 from the beach, swimming out, and returning to the same location. The dives are conducted
12 during either day or night. Small boats are used during these activities, but do not come ashore.

13
14 United States Army Special Forces Command Airborne Beach Assault/Combat Dive
15 Qualification Operations – A Biological Assessment was prepared for these activities, which
16 have occurred only once to date on SRI (June 2010). This training is also known as HAVE
17 ACE. Phase I of the training consists of an open circuit SCUBA operation coming ashore at
18 A-15 from the Gulf of Mexico. Three to four Zodiac boats depart from the Destin Coast Guard
19 Station with no divers aboard. The boats enter the Gulf and travel to a point approximately due
20 south of A-15, coming no closer than 1,500 meters from the shoreline. Upon arrival, a single
21 boat approaches the beach and picks up four divers who are transferred to offshore boats to begin
22 the exercise. The divers practice open water swimming techniques in deep water and then
23 conduct a long swim exercise using SCUBA equipment. The objective is for each student to
24 successfully come ashore at a designated spot on the beach at A-15. Instructors are present at all
25 times during this phase of the training. The instructors would be in boats to ensure student safety
26 and also onshore on the A-15 helicopter pad to ensure that students land and travel only in
27 authorized areas. Support personnel on the boats have constant communication with support
28 personnel on the shore through radio and have white light capabilities for use in emergency
29 situations only.

30
31 During Phase II of the program, 24 trainees leave the Destin Coast Guard Station in three to four
32 Zodiac boats and assault the beach at A-15. The boats land onshore and the students make their
33 way inland and assault Building 12524, near the A-15 main building located 200 meters north of
34 the beach. Once the assault is complete, the trainees return to the boats and exfil the island.
35 Similar to Phase I, instructors are present during all portions of this exercise and are stationed as
36 guides onshore at A-15.

37
38 The total amount of time spent on the beach is less than one hour for no more than 12 nights
39 under Phase I and Phase II. Instructors perform all pre-staging and set-up activities for the area
40 on the helicopter pad and the students are only on the beach for transition between the boats and
41 the beach during infil and exfil of the island. No lights are utilized during these nighttime
42 activities. All personnel use night vision goggles and an infrared strobe is used to mark the
43 location on the beach where the boats should land. Support personnel have white lights
44 available, but they are only used in emergency situations concerning the health and safety of the
45 trainees.

Appendix A

Military Testing and Training and Other Land Use Activities

1 Force Protection (FP) Demonstrations - The U.S. Air Force demonstrates a range of Force
 2 Protection (FP) tasks, including perimeter security surveillance and waterside security at A-17
 3 during Joint Force Protection Advanced Security System IA-3/OD-1.

4
 5 Close Quarters Battle Training - Close Quarters Battle training, also known as Close Quarters
 6 Combat training, is currently conducted at selected facilities and the immediately surrounding
 7 land at Test Area A-15 and Test Site A-11. Under the Preferred Alternative of this document,
 8 additional facilities and immediately surrounding land would also be utilized at Test Site A-13.
 9 Training activities include small arms blanks, small pyrotechnic devices, and small door
 10 breaching charges small explosive charges (maximum of 0.66 pounds net explosive weight
 11 [NEW]) used in and around buildings.

12 **A.3 SURF ZONE TESTING/TRAINING IN ESTABLISHED**
 13 **SURF ZONE TESTING AREAS**

14 Numerous surf zone testing/training activities occur or have occurred in the past at various
 15 locations on SRI. Major surf zone test exercises include neutral (inert) systems and, historically,
 16 live (containing explosive material) systems, which would be detonated underwater in shallow
 17 water. Testing of actual charges on SRI included surf zone test detonations of the Shallow Water
 18 Assault Breaching System (SABRE) shells, bombs for obstacle clearing, and LCAC line-charge
 19 systems. Small boat obscurant testing with smokes has also occurred within these areas. The
 20 Preferred Alternative in the 2005 SRI PEA (U.S. Air Force, 2005) designated specific surf zone
 21 testing/training areas at Test Areas A-15, A-10, and A-2. These areas were chosen based on
 22 their accessibility to the surf zone on the south side of SRI, the availability of power, water and
 23 some limited facilities, and surrounding land use constraints associated with a preliminary
 24 assessment of potential natural and cultural resources and IRP considerations. Specific examples
 25 of surf zone testing/training activities are as follows:

26
 27 SABRE Mine Clearing Testing - The surf zone is the only place SABRE can adequately be tested,
 28 while crews train on proper weapon deployment. To accomplish these tests and training
 29 requirements, an LCAC pad or loading zone with roads and lights leading to it would typically be
 30 established, as well as an area where the LCAC can transient over SRI from the Gulf of Mexico to
 31 Santa Rosa Sound. Testing of the SABRE system involves launching of a line charge subsystem
 32 propelled by rocket motors. This could require closure of sections of Hwy 98 and some areas of
 33 the Gulf of Mexico and Choctawhatchee Bay waters to accommodate a 2.5-mile, 110-degree safety
 34 fan if these tests are conducted on the eastern portion of SRI. Recovery operations could also
 35 require a brief closing of Hwy 98 (Pipkin, 1996). This test was evaluated and approved through
 36 the *Environmental Assessment for Coastal Testing of the Shallow Water Assault Breaching*
 37 *(SABRE) and Distributed Explosive Technology (DET) Systems* (U.S. Air Force, 1998c) and
 38 *Biological Assessment for Coastal Testing of the SABRE and DET Systems* (U.S. Air Force, 1998d)
 39 and received a Letter of Authorization for the Incidental Harassment of Marine Mammals from
 40 Surf Zone Testing Missions at Eglin AFB, FL (U.S. Air Force, 1998e). Only a portion of the test
 41 was completed, and future activities may involve this type of testing in areas other than those
 42 evaluated in the previous EA.
 43

Appendix A

Military Testing and Training and Other Land Use Activities

1 Beach Obstacle Clearing and Neutralization - These activities involve simultaneous multiple
 2 detonations of bombs in the surf zone. These will be evaluated to assess their effects on
 3 obstacles and mines as a potential beach-clearing tactic. These bombs would be set off
 4 simultaneously to evaluate their effects and potential for this type of application.

5 **A.4 PUBLIC LAND USE**

6 Eglin AFB controls 4,760 acres of SRI that includes a 4-mile strip of limited-access beach
 7 eastward of Fort Walton Beach, a restricted access 13-mile section extending to the west to
 8 Navarre Beach, Florida, and a small 0.25-mile section in between the two parcels at Test Area
 9 A-5. There are 2.5 miles of Okaloosa County controlled property between the two parcels of
 10 Eglin property. The public accesses the Gulf-side and sound-side beaches at multiple locations
 11 along the limited-access portion of SRI on the south and north sides of Highway 98 (Hwy 98).
 12 The public typically accesses the beach by parking on the shell easement along Hwy 98 and
 13 walking to identified access points. Authorized public recreation on the limited-access portion of
 14 SRI consists of fishing, swimming, sun bathing, and beach walking. Recreationalists are
 15 instructed to stay below the primary dune line. Some unauthorized recreation would include
 16 beach driving, sand dune sledding, night camping, and campfires. The area comprising the 4-mile
 17 strip east of Ft. Walton Beach is open to public access through identified access points. Range
 18 patrols occur when the beach area is closed due to mission activity. The beach is patrolled on a
 19 daily basis during peak seasons such as Spring Break, July Fourth, and other high-use holidays,
 20 and as often as possible during other times of the year. When range patrol is not present, there is
 21 the potential for the vandalism of government property and adverse impacts to natural resources
 22 including threatened and endangered species on the eastern portion of SRI from public access.

23
 24 The portion of SRI controlled by Okaloosa County is composed of residential, public, and
 25 commercial areas. Marinas, hotels, condominiums, houses, parks, restaurants, bars/clubs, and
 26 shops are found throughout the county portion of SRI. The public uses these areas for
 27 recreational activities, and near-shore areas of the Gulf are used for boating and fishing.

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APPENDIX B
SEA TURTLE LIGHTING GUIDELINES

7-5

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FWC APPROVED SEA TURTLE LIGHTING

All exterior lighting for the entire project area including structural and landscape lighting must be reviewed and approved by FWC regardless of whether or not the area is seaward of the CCCL

ACCEPTABLE FIXTURES

All exterior fixtures on the seaward and the shore perpendicular sides of the building (and on the landward side of the building if they are visible from the beach) should be well shielded, full cut-off, downward directed type fixtures. All exterior fixtures on the landward side of the building should be downward directed only.

ACCEPTABLE LAMPS / BULBS AND OTHER LIGHT SOURCES

Long wave length lights, e.g. those that produce light that measures greater than 560 nanometers on a spectroscope, are necessary for all construction visible from and adjacent to marine turtle nesting beaches. Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps will not be approved. Filters are unreliable and not allowed. Limited use of shorter wavelength lights may be approved in areas where direct and indirect light or glow could not possibly be visible from the beach upon approval by FWC.

ACCEPTABLE LAMPS

- Low Pressure Sodium (LPS) 18w, 35w
- Red, orange or amber LED (true red, orange or amber diodes, NOT filters)
- True red neon
- Other lighting sources that produce light of 560 nm or longer

**** FWC approved lighting may be found at <http://www.myfwc.com/conservation/you- conserve/lighting/certified/> ****

STATEMENT ABOUT POOL LIGHTS ON LIGHTING PLAN

The plan shall reflect that the interior swimming pool and pool deck lights shall be turned off while the pool is closed during sea turtle nesting season (May 1 through October 31 in all counties except Brevard, Indian River, St. Lucie, Martin, Palm Beach and Broward counties where leatherback turtle nesting occurs during the period of March 1 through October 31). The use of an automatic timer is acceptable. This may be specified in the notes section on the drawing and should be included in the FDEP Permit Conditions. If the interior pool lights cannot be turned off at night because the pool deck is used at night, then interior pool lights shall be amber or red LED lamps.

STATEMENT ABOUT TURTLE GLASS ON LIGHTING PLAN

The plan shall reflect that tinted glass or film with a visible light transmittance value of forty-five (45) percent or less shall be applied to all windows and doors within line of sight of the beach. This includes the seaward and shore-perpendicular sides of the structure. This may be specified in the notes section on the Lighting Plan architectural drawing and should be included in the FDEP Permit Conditions.




TIMERS



Timers may be used only for in-pool and pool deck lights when the pool is closed.


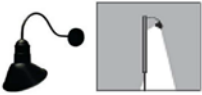
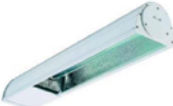
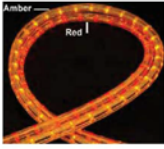
THE FOLLOWING ARE NOT ALLOWED

- Private balcony lights
- Up lights
- Tree strap downlights
- Decorative lighting, not necessary for human safety or security
- Pond lights
- Dune walkover lighting
- Fountain lights on beach or shore perpendicular side of structure

EXAMPLES OF TURTLE FRIENDLY FIXTURES

FIXTURE	LAMP & WATTAGE	MOUNTING TYPE & HEIGHT	LOCATION	COMMENTS and/or ADDITIONAL REQUIREMENT
<p>Ceiling Mount Cylinder (with interior black baffles)</p> 	<p>Red/orange/amber LED</p>	<p>Ceiling Surface</p>	<p>if located on shore perpendicular or beach side of structure allow on <u>ground floor</u> only</p>	<p>Interior Black Baffles</p>
<p>Wall Mount Cylinder Down Light (with interior black baffles)</p> 	<p>Red/orange/amber LED</p>	<p>Wall Mount Downward Directed 8 ft from floor</p>	<p>If located on shore perpendicular or beach side of structure allow on <u>first habitable floor</u> only</p>	<p>Interior Black Baffles Hex cell louvers may be required to decrease wall wash</p>
<p>Recessed Ceiling Canister</p> 	<p>Red/orange/amber LED</p> <p><i>The following short wavelength lamps may only be used for covered driveway entry on landward side of structures</i></p> <ul style="list-style-type: none"> • Halogen lamp • PAR spot lamps • LED lamps • HPS lamps • Comp Fluorescent 	<p>Recessed Ceiling</p>	<p>If located on shore perpendicular or beach side of structure allow on <u>ground floor</u> only</p>	<p>Interior black baffles Hex cell (honeycomb) louver</p>

<p>Recessed and Wall Mounted Step Lights (louvered or downward directed)</p> 	<p>Red/orange/amber LED</p>	<p>Wall Mount Maximum height 24 inches on Ground Floor only Above Ground Floor Max height 12 inches</p>	<p>Ground Floor and Second level, and pool Deck</p>	<p>If on perimeter of pool deck, must be mounted directed away from beach.</p>
<p>Bollard (with downward directed louvers)</p> 	<p>18w LPS Red/orange/amber LED</p>	<p>Maximum height 42 in</p>	<p>Parking areas, commercial walkway, landscape, pathway and pool Deck</p>	<p>180° to 270° beach side shields on any fixture on perimeter of pool deck or immediately adjacent to beach.</p>
<p>High Intensity Full Cut Off Pole Lights</p> 	<p>18-35 w LPS (if twin head, maximum of 36w total) Orange/amber LED</p>	<p>Pole - maximum height 12 feet</p>	<p>Parking Area Landward side of structure only.</p>	<p>Beach Side shields and/or louvers for any fixture within line of sight of beach.</p>
<p>Paver Lights</p> 	<p>Red/orange/amber LED</p>	<p>In Ground mount</p>	<p>Parking areas, driveways, pathways, pool decks</p>	

<p>Landscape/Pathway Lighting</p> 	<p>Red/orange/amber LED</p>	<p>Ground mount Maximum height 12 inches</p>	<p>Ground Level, landscape</p>	
<p>Signage</p> 	<p>Red/orange/amber LED</p>	<p>Must be mounted with light directed <u>down</u> on to sign. NOT UP</p>	<p>Sign should be on landward side of structure when possible and mounted perpendicular to the beach.</p>	
<p>Garage Lighting (Phoenix)</p> 	<p>35w LPS Amber/Orange LED</p>	<p>Garage Ceiling</p>	<p>Garage</p>	<p>If a parking garage is not fully enclosed with solid walls, without windows, louvers, or screens so that the interior is not visible from any section of beach, only LPS or amber/orange LED lamps shall be used. Additional shields may be necessary if parking is above ground level.</p>
<p>Channel / Rope Lighting</p> 	<p>Red/orange/amber LED <u>NOT colored plastic tubing with white lights</u> <u>No White LED</u></p>	<p>Must be mounted recessed under steps, bar, etc. and directed <u>down</u> to assure that light source or reflected light is not visible from beach</p>	<p>Pool deck, steps, pool bars.</p>	

<p>Water Feature Lighting</p>	<p>Red/orange/amber LED</p>	<p>Light must be downward or horizontally directed DO NOT direct light up</p>	<p>Submerged lights are only allowed on landward side of structure and only if fully shielded from beach by structure</p>	
<p>Underwater Swimming Pool Lighting</p>	<p>Red/orange/amber LED</p>			

Revised 3/8/11

BIOLOGICAL OPINION

**Santa Rosa Island
Testing and Training Activities**

**Biological Opinion
February 11, 2012**

**Prepared by:
U.S. Fish and Wildlife Service
Panama City, FL**



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Acronyms

Act	Endangered Species Act
ATVs	All-Terrain Vehicles
BA	Biological Assessment
BLZ	Boat Landing Sites
BO	Biological Opinion
DPS	Distinct Population Segment
GOM	Gulf of Mexico
HLZ	Helicopter Land Zones
INRMP	Natural Resource Management Program
MA	May Affect
NAM	Not Likely to Adversely Modify
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
LCAC	Landing Craft Air Cushion
STSSN	Sea Turtle Stranding and Salvage Network
SRI	Santa Rosa Island
Teds	Turtle Excluder Devices
TW	Training Wing

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February 11, 2012

Mr. Bruce Hagedorn
Chief, Eglin Natural Resources
96CEG/CEVSN
501 DeLeon Street, Suite 101
Eglin Air Force Base, Florida 32542-5133

Re: FWS Log No. 2012-F-0048
Date Started: October 5, 2011
Project Title: Testing and Training Activities
Location: Santa Rosa Island, Eglin AFB
Ecosystem: NE Gulf
County: Okaloosa and Santa Rosa Counties,
Florida

Dear Mr. Hagedorn:

Enclosed is the Fish and Wildlife Service's (Service) biological opinion for the proposed Eglin Air Force Base (Eglin) Santa Rosa Island Training and Testing Activities located in Walton County, Florida. As described in your October 5, 2011 letter, Eglin has completed an evaluation of the impacts the action may have on the threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*), and the piping plover (*Charadrius melodus*). In that letter and supporting biological assessment of the action, Eglin had determined that the proposed activities may affect (MA) nesting threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*) and the piping plover (*Charadrius melodus*), and that piping plover critical habitat would not be adversely modified. The Service concurs with your determinations. This biological opinion is based on information provided in the October 5, 2011 biological assessment, and other sources of information. This opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). We have assigned log number 2012-F-0048 to this consultation. A complete administrative record of this consultation is on file at the Panama City Field Office.

Table 1. Species and critical habitat evaluated for effects where the Service has concurred with a not likely to be adversely affected determination.

SPECIES or CRITICAL HABITAT	PRESENT IN ACTION AREA	PRESENT IN ACTION AREA BUT NOT LIKELY TO BE ADVERSELY AFFECTED ^e
Piping plover	Yes	Yes
Piping plover critical habitat	No	No

The above species and critical habitat not impacted by this action will not be discussed further in this biological opinion.

Consultation History

September 30, 2011 Eglin sends their Biological Assessment “Training and Testing Activities on Santa Rosa Island” via regular mail. Eglin requests initiation of formal consultation with the Service pursuant to section 7 of the Act concerning nesting sea turtles. Eglin determined that the proposed work would not likely to adversely affect (NLAA) piping plover and not likely adversely modify (NAM) designated critical habitat for the piping plover.

October 5, 2011 The Service receives Eglin AFB’s Biological Assessment “Training and Testing Activities on Santa Rosa Island”. The Service acknowledges receipt of the request and begins the consultation process.

January 6, 2012 Telephone discussion with Eglin discussing formal consultation.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The Service has defined the action area to include the entirety of Santa Rosa Island (SRI) as discussed in the EFFECTS OF THE ACTION section of this consultation.

The proposed action is to authorize an increased training activity level for areas on SRI for the 46th Training Wing (TW).

The major testing and training activities are categorized as follows:

- Surface-to-air missile testing. This includes missile launches from SRI or surface vessels, targeting aircraft in the EGTTR. Typical missiles include PATRIOT, AMRAAM, and AIM.

- Electronic countermeasures and electronic systems testing. ECM testing evaluates an aircraft system's ability to defeat threats and includes training on combatting electronic signals.
- Open air hardware in the loop (OA-HITL) testing. The OA-HITL tower at A-13B is used to support this activity. The tower is used to evaluate Command, Control, Communications, Computer, Intelligence and Surveillance/Reconnaissance systems.
- Ground Testing and Training. Ground testing typically supports littoral warfare programs and includes testing of equipment, obscurants, and biological aerosol stimulants. Ground training activities may be categorized as maneuvers or static training. These activities may involve the use of small arms blank ammunition and live fire, smokes and other expendables.
- Surf zone testing and training activities occur within the Gulf-side shallow water (30 foot maximum depth) environment of SRI. Such activities include mine and obstacle clearing, training and landing craft air cushion (LCAC) operations. Some 75lb and smaller munitions use is included in these activities.
- Laser use. A number of missions on SRI involve the use of lasers. These are used to detect obstacles, aircraft, and biological aerosol stimulants.
- Establishment of a Close Quarters Battle Training Area. This would consist of facilities at Test Area A-15, test sites A-13, and A-11. Training activities include small arms blanks, small pyrotechnic devices, and small door breaching charges and small explosive charges (maximum of .66 lbs.).
- Additional Helicopter Landing zone and boat sites. A total of 16 boat landing sites (BSLs) would be designated on the sound and Gulf sides of SRI. A total of 14 helicopter landing zones (HLZ) would be designated. Nine of those would be on unimproved surfaces and 5 on paved surfaces.
- Establishment of A-15 Designated training area. Due to the active, ongoing training at A-15, and the sometimes immediate need for a specific training event, a dedicated training area is needed almost continually. The proposed action includes the establishment of such an area at A-15. The site boundary would coincide with current ALRT Mission Area and expand to the east and west, while extending to the littoral zones of the Gulf of Mexico (GOM) and Santa Rosa Sound. The site would support a variety of training activities involving troop movement, boat and helicopter landings, and vehicle use.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species/critical habitat description

The Service has responsibility for implementing recovery of sea turtles when they come ashore to nest. This biological opinion addresses nesting sea turtles, their nests and eggs, and hatchlings as they emerge from the nest and crawl to the sea. The National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries) has jurisdiction over sea turtles in the marine environment.

Three species of sea turtles are analyzed in this biological opinion: the threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), and the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*).

Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*), listed as a threatened species on July 28, 1978 (43 FR 32800). NOAA-Fisheries announced on March 5, 2008, a 90-day finding under the Act to reclassify the North Atlantic Ocean loggerhead sea turtles as a Distinct Population Segment (DPS) with endangered status and critical habitat designation (73 FR 11849). The loggerhead inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Loggerhead sea turtles nest within the continental U.S. from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (Hopkins and Richardson 1984).

The loggerhead sea turtle grows to an average weight of about 200 pounds and is characterized by a large head with blunt jaws. Adults and subadults have a reddish-brown carapace. Scales on the top of the head and top of the flippers are also reddish-brown with yellow on the borders. Hatchlings are a dull brown color (NOAA-Fisheries 2002a). The loggerhead feeds on mollusks, crustaceans, fish, and other marine animals.

Major loggerhead sea turtle nesting beaches are located in the Sultanate of Oman, southeastern U.S., and eastern Australia. The species is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and ship wrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and often in association with other species of sea turtles.

No critical habitat has been designated for the loggerhead sea turtle.

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) was federally listed as a protected species on July 28, 1978 (43 FR 32800). Breeding populations of the green turtle in Florida and along the Pacific

Coast of Mexico are listed as endangered; all other populations are listed as threatened. The green sea turtle has a worldwide distribution in tropical and subtropical waters. Major green sea turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (NOAA-Fisheries and Service 1991a). Nesting also has been documented along the Gulf coast of Florida from Escambia County through Franklin County in Northwest Florida and from Pinellas County through Collier County in Southwest Florida (Florida Fish and Wildlife Conservation Commission, Florida Wildlife Research Institute (FWC/FWRI) statewide nesting database). Green sea turtles have been known to nest in Georgia, but only on rare occasions (Georgia Department of Natural Resources statewide nesting database). The green sea turtle also nests sporadically in North Carolina and South Carolina (North Carolina Wildlife Resources Commission statewide nesting database; South Carolina Department of Natural Resources statewide nesting database). Unconfirmed nesting of green sea turtles in Alabama has also been reported (Bon Secour National Wildlife Refuge nesting reports).

The green sea turtle grows to a maximum size of about 4 feet and a weight of 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers. The carapace is smooth and colored gray, green, brown and black. Hatchlings are black on top and white on the bottom (NOAA-Fisheries 2002b). Hatchling green turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae.

The green sea turtle has a worldwide distribution in tropical and subtropical waters. Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. They are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. The sea turtle is attracted to lagoons and shoals with an abundance of marine grass and algae. Open beaches with a sloping platform and minimal disturbance are required for nesting.

Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle (*Lepidochelys kempii*) was listed as endangered on December 2, 1970 (35 FR 18320). The range of the Kemp's ridley includes the Gulf coasts of Mexico and the U.S. and the Atlantic coasts of North America as far north as Nova Scotia and Newfoundland. Most Kemp's ridleys nest on the coastal beaches of the Mexican states of Tamaulipas and Veracruz, although a small number of Kemp's ridleys nest along the Texas coast (Turtle Expert Working Group 1998; Frey et al. 2007). In addition, rare nesting events have been reported in Florida, Alabama, Georgia, South Carolina, and North Carolina. Hatchlings, after leaving the nesting beach, are believed to become entrained in eddies within the GOM, where they are dispersed throughout the Gulf and Atlantic by oceanic surface currents until they reach about 7.9 inches in length, at which size they enter coastal shallow water habitats (Ogren 1989). Outside

of nesting, adult Kemp's ridleys are believed to spend most of their time in the GOM, while juveniles and subadults also regularly occur along the eastern seaboard of the United States (Service and NOAA-Fisheries 1992).

No critical habitat has been designated for the Kemp's ridley sea turtle.

Life history

Loggerhead Sea Turtle

The basic life cycle of the loggerhead sea turtle in the western North Atlantic consists of seven life stages (**Figure 1**) that are based on the size of the sea turtles at different ages (Crouse et al. 1987). In Northwest Florida, loggerheads nest between May and October.

Loggerheads are known to nest from one to seven times within a nesting season (Talbert et al. 1980; Richardson and Richardson 1982; Lenarz et al. 1981, among others); the mean is approximately 4.1 nests (Murphy and Hopkins 1984). The interval between nesting events within a season varies around a mean of about 14 days (Dodd 1988). Mean clutch size varies from about 100 to 126 eggs along the southeastern United States coast (NOAA-Fisheries and Service 1991b). Nesting migration intervals of 2 to 3 years are most common in loggerheads, but the number can vary from 1 to 7 years (Dodd 1988). Age at sexual maturity is believed to be about 20 to 30 years (Turtle Expert Working Group 1998).

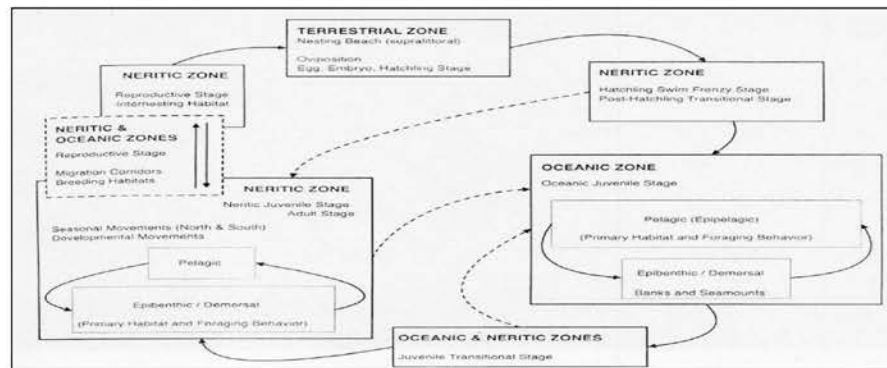


Figure 1. Life history stages of a loggerhead turtle. The boxes represent life stages and the corresponding ecosystems, solid lines represent movements between life stages and ecosystems and dotted lines are speculative (Bolten 2003).

Green Sea Turtle

Green turtle nesting occurs from May to October. Green sea turtles deposit from one to nine clutches within a nesting season, but the overall average is about 3.3 nests. The interval between nesting events within a season varies around a mean of about 13 days (Hirth 1997). Mean clutch size varies widely among populations. Average clutch size reported for Florida was 136 eggs in

130 clutches (Witherington and Ehrhart 1989). Only occasionally do females produce clutches in successive years. Usually 2, 3, 4, or more years intervene between breeding seasons (NOAA-Fisheries and Service 1991a). Age at sexual maturity is believed to be 20 to 50 years (Hirth 1997).

Kemp's Ridley Sea Turtle

Nesting occurs from April into July during which time the turtles appear off the Tamaulipas and Veracruz coasts of Mexico. Precipitated by strong winds, the females swarm to mass nesting emergences, known as *arribadas* or *arribazones*, to nest during daylight hours. Clutch size averages 100 eggs (Service and NOAA-Fisheries 1992). Some females breed annually and nest an average of 1 to 4 times in a season at intervals of 10 to 28 days. Age at sexual maturity is believed to be between 7 to 15 years (Turtle Expert Working Group 1998).

Nesting and hatchling sea turtles in the Florida panhandle have been affected by a variety of activities including military missions and testing, coastal development and associated activities, oil and gas exploration, and navigation channel dredging.

Population dynamics

Loggerhead Sea Turtle

Genetic research involving analysis of mitochondrial DNA has identified five different loggerhead subpopulations/nesting aggregations in the western North Atlantic: (1) the Northern Subpopulation occurring from North Carolina to around Cape Canaveral, Florida (about 29° N.); (2) South Florida Subpopulation occurring from about 29° N. on Florida's east coast to Sarasota on Florida's west coast; (3) Dry Tortugas, Florida, Subpopulation, (4) Northwest Florida Subpopulation occurring at Eglin Air Force Base and the beaches near Panama City; and (5) Yucatán Subpopulation occurring on the eastern Yucatán Peninsula, Mexico (Bowen 1994, 1995; Bowen et al. 1993; Encalada et al. 1998; Pearce 2001). These data indicate that gene flow between these five regions is low. If nesting females are extirpated from one of these regions, regional dispersal may not be sufficient to replenish the depleted nesting subpopulation.

The Northern Subpopulation has declined substantially since the early 1970s. Recent estimates of loggerhead nesting trends from standardized daily beach surveys showed significant declines ranging from 1.5 % to 2.0 % annually (Dodd 2005 pers. comm.). Nest totals from aerial surveys conducted by the South Carolina Department of Natural Resources showed a 3.3 % annual decline in nesting since 1980.

Data from all beaches where nesting activity has been recorded indicate that the South Florida Subpopulation has shown increases over the last 25 years. However, an analysis of nesting data from the Florida INBS Program from 1989 to 2002 (a period encompassing index surveys that are more consistent and more accurate than surveys in previous years), has shown no detectable trend. In contrast more recent analyses (1998 through 2002) have shown a declining trend (Witherington 2003 pers. comm.). Given inherent annual fluctuations in nesting and the short

time period over which the decline has been noted, caution is warranted in interpreting the decrease in terms of nesting trends.

The Florida loggerhead sea turtle Northwest Florida Subpopulation occurs along the northern Gulf Coast of Florida. A near complete census of this nesting subpopulation, undertaken from 1995 to 2006 revealed a mean of 910 nests per year during that period (approximately 222 females nesting each year; FWC/FWRI sea turtle nesting database and unpublished data). The Florida Panhandle Nesting Subpopulation showed a significant declining trend ($P=0.04$) of 6.8% annually from 1995 and 2005 (FWC/FWRI sea turtle nesting database and unpublished data).

A nearly complete census of the Dry Tortugas Subpopulation undertaken from 1995 to 2001 showed a mean of 213 nests per year, which equates to about 50 females nesting per year (FWC/FWRI sea turtle nesting database). The data for the Dry Tortugas Subpopulation are from beaches that were not included in Florida's INBS program prior to 2004 but result from moderately consistent monitoring. There are 7 continuous years (1995 to 2001) of data for this Subpopulation, but there is not enough data to assess nesting trends (Witherington 2005 pers. comm.).

Nesting surveys in the Yucatán Subpopulation have been too irregular to date to allow for a meaningful trend analysis (Turtle Expert Working Group 1998, 2000).

Loggerheads are the most common nesting sea turtle and account for over 99 percent of the sea turtle nests in northwest Florida. The eastern portion of the panhandle has the majority of loggerhead nesting (**Figure 2**). Nesting densities range from 1.1 to 9.7 nests per mile in that region (**Figure 2**). The loggerhead sea turtle nesting and hatching season for the region is generally considered to extend between May 1 and November 1. The earliest nest documented was on May 1 (Franklin and Okaloosa counties) and the latest nest was on November 1 (Bay County; FWC/FWRI statewide sea turtle nesting database). Nest incubation ranges from about 49 to 95 days.

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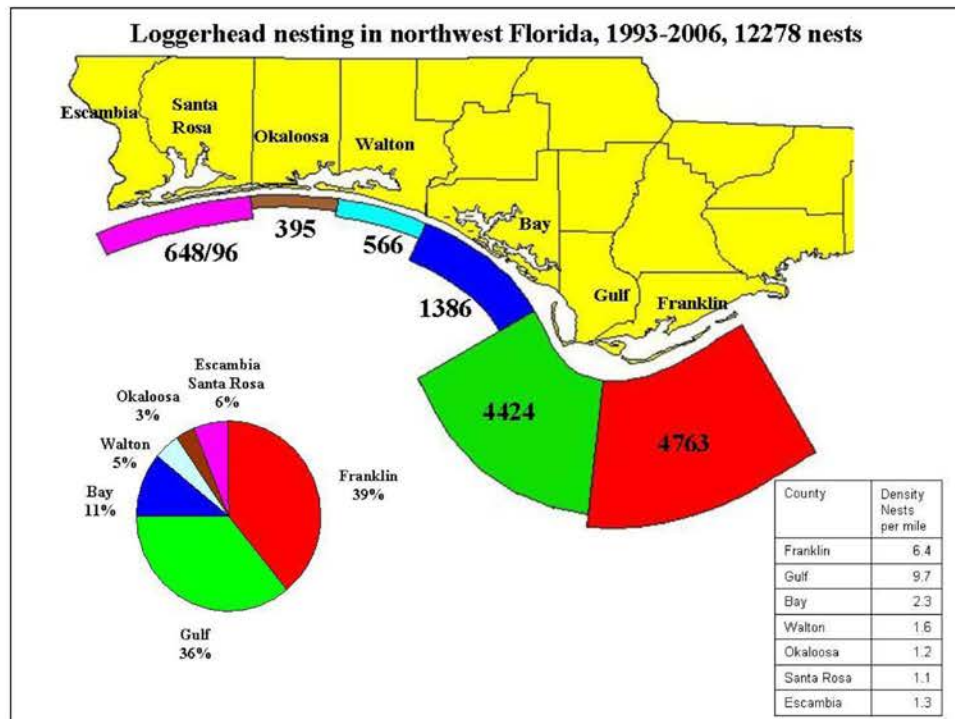


Figure 2. Loggerhead nesting in northwest Florida, 1993-2006.

Recovery criteria

The southeastern U.S. population of the loggerhead can be considered for delisting where, over a period of 25 years, the following conditions are met:

1. The adult female population in Florida is increasing and in North Carolina, South Carolina, and Georgia, it has returned to pre-listing levels (NC - 800, SC - 10,000, and GA - 2,000 nests per season). The above conditions must be met with the data from standardized surveys which would continue for at least five years after delisting.
2. At least 25 percent (348 miles) of all available nesting beaches (1,400 miles) are in public ownership, distributed over the entire nesting range and encompassing at least 50 percent of the nesting activity in each state.
3. All priority one tasks identified in the recovery plan have been successfully implemented.

The Recovery Plan for the loggerhead sea turtle is currently under revision. An initial Recovery Plan for the loggerhead turtle was approved on September 19, 1984. This initial plan was a multi-species plan for all six species of sea turtles occurring in the U.S. On December 26, 1991, a separate recovery plan for the U.S. Atlantic population of the loggerhead turtle was approved. Since approval of the first revised plan in 1991, significant research has been accomplished and important conservation and recovery activities have been undertaken. As a result, we have a greater knowledge of the species and its status. These advances in our understanding of the loggerhead sea turtle make a second revision of the Atlantic loggerhead recovery plan necessary.

A five-year status review of the loggerhead sea turtle was completed by the Service and the National Marine Fisheries Service in August 2007 (National Marine Fisheries Service and Service 2007a). A recommendation has been made to determine the application of the Distinct Population Segment (DPS) policy for the species. A DPS is a population segment that is discrete in relation to the remainder of the species to which it belongs, and significant to the species to which it belongs. This indicates that there is enough information available to consider designating DPSs for the separate nesting subpopulations of loggerhead sea turtles, including the Florida panhandle subpopulation.

Green Sea Turtle

Total population estimates for the green turtle are unavailable, and trends based on nesting data are difficult to assess because of large annual fluctuations in numbers of nesting females. For instance, in Florida, where the majority of green turtle nesting in the southeastern U.S. occurs, estimates range from 150 to 2,750 females nesting annually (FWC/FWRI statewide sea turtle nesting database). Populations in Surinam and Tortuguero, Costa Rica, may be stable, but there is insufficient data for other areas to confirm a trend.

Green sea turtle nesting has been documented in all counties (but not on all beaches) in northwest Florida (**Figure 3**). The green sea turtle nesting and hatching season for this region extends from May 1 through October 31, the earliest nest was documented on May 19 (Franklin County) and the latest nest was documented on August 23 (Escambia County). Nest incubation ranges from about 60 to 90 days. Nesting in northwest Florida has been consistently documented at least every other year since 1990 (FWC/FWRI statewide sea turtle nesting database).

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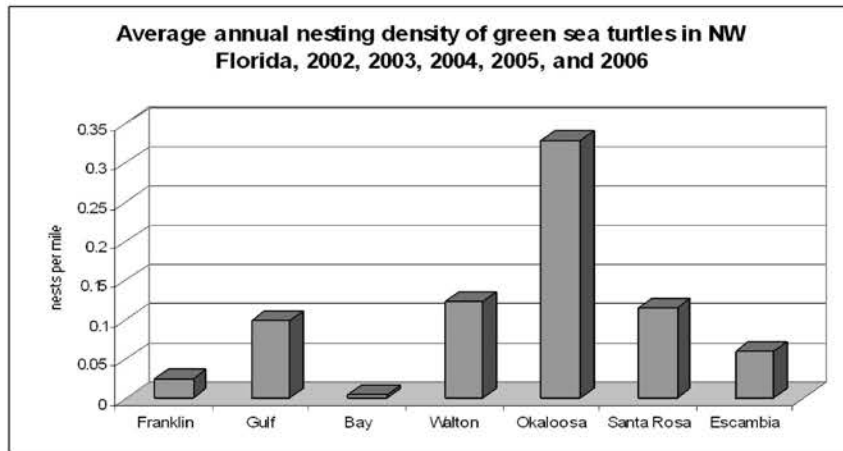


Figure 3. Average annual green sea turtle nesting density in northwest Florida in 2002, 2003, 2004, 2005, and 2006.

Recovery criteria

The U.S. population of green sea turtles can be considered for delisting when, over a period of 25 years, the following conditions are met:

1. The level of nesting in Florida has increased to an average of 5,000 nests per year for at least six years. Nesting data must be based on standardized surveys.
2. At least 25 percent (65 miles) of all available nesting beaches (260 miles) are in public ownership and encompass at least 50 percent of the nesting activity.
3. A reduction in stage class mortality is reflected in higher counts of individuals on foraging grounds.
4. All priority one tasks identified in the Recovery Plan have been successfully implemented.

The current “Recovery Plan for the U.S. Population of Atlantic Green Turtle (*Chelonia mydas*)” was completed in 1991, the Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*)” was completed in 1998, and the “Recovery Plan for U.S. Pacific Populations of the East Pacific Green Turtle (*Chelonia mydas*)” was completed in 1998. The recovery criteria contained in the plans, while not strictly adhering to all elements of the Recovery Planning Guidelines (Service and NOAA), are a viable measure of the species status.

A five-year status review of the green sea turtle was completed by the Service and the National Marine Fisheries Service in August 2007 (National Marine Fisheries Service and Service 2007b).

A recommendation has been made to conduct an analysis and review of the species to determine the application of the DPS policy for the species. A DPS is a population segment that is discrete in relation to the remainder of the species to which it belongs, and significant to the species to which it belongs. Since the species' listing, a substantial amount of information has become available on population structure (through genetic studies) and distribution (through telemetry, tagging, and genetic studies). The data has not been fully assembled or analyzed; however, at a minimum, these data appear to indicate a possible separation of populations by ocean basins.

Kemp's Ridley Sea Turtle

Today, under strict protection, the population appears to be in the early stages of recovery. The recent nesting increase can be attributed to full protection of nesting females and their nests in Mexico resulting from a bi-national effort between Mexico and the U.S. to prevent the extinction of the Kemp's ridley, and the requirement to use Turtle Excluder Devices (TEDs) in shrimp trawls both in the United States and Mexico.

The Mexico government also prohibits harvesting and is working to increase the population through more intensive law enforcement, by fencing nest areas to diminish natural predation, and by relocating most nests into corrals to prevent poaching and predation. While relocation of nests into corrals is currently a necessary management measure, this relocation and concentration of eggs into a "safe" area is of concern since it makes the eggs more susceptible to reduced viability.

Twenty-six Kemp's ridley nests have now been documented in Florida in Brevard, Escambia, Gulf, Lee, Martin, Palm Beach, Pinellas, Santa Rosa, Sarasota, and Volusia counties (FWC/FWRI statewide sea turtle nesting database) (**Figure 4**). The Kemp's ridley sea turtle nesting and hatching season for this region extends from May 1 through October 31. For confirmed nesting, the earliest nest in northwest Florida was documented on May 14 (Escambia County) and the latest nest July 21 (Escambia County).

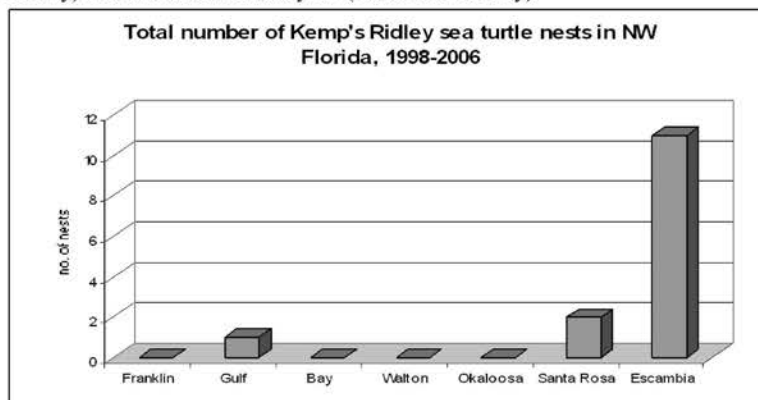


Figure 4. Number of Kemp's ridley sea turtle nests in NW Florida 1998-2006.

Recovery criteria

The goal of the Recovery Plan is for the species to be reduced from endangered to threatened status. The Recovery Team members feel that the criteria for a complete removal of this species from the endangered species list need not be considered now, but rather left for future revisions of the plan. Complete removal from the Federal list would certainly necessitate that some other instrument of protection, similar to the Marine Mammal Protection Act, be in place and be international in scope. Kemp's ridley can be considered for downlisting to threatened when the following four criteria are met:

1. Protection of the known nesting habitat and the water adjacent to the nesting beach (concentrating on the Ranch Nuevo area) and continuation of the bi-national project.
2. Elimination of the mortality from incidental catch from commercial shrimping in the U.S. and Mexico through the use of TEDs and full compliance with the regulations requiring TED use.
3. Attainment of a population of at least 10,000 females nesting in a season.
4. All priority one recovery tasks in the recovery plan are successfully implemented.

The current "Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)" was signed in 1992. Significant new information on the biology and population status of Kemp's ridley has become available since 1992. Consequently, a full revision of the recovery plan has been undertaken by the Service and NOAA and is nearing completion. The revised plan will provide updated species biology and population status information, objective and measurable recovery criteria, and updated and prioritized recovery actions.

Predators/competitors/disease factorsPredation

Depredation by a variety of predators can considerably decrease sea turtle nest hatching success. Depredation and harassment or both of nesting turtles, eggs, nests and hatchlings by native and non-native species, such as raccoon, coyote, fox, feral hog, cats, birds, and ghost crab, have been documented on the Atlantic and Gulf coasts of Florida (Daniel et al. 2002; Northwest Florida Partnership 2002; Leland 1997; Maxwell 2002; Maxwell pers. com. 2006; National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a, 1991b). As nesting habitat dwindles, it is essential that nest production be naturally maximized so the turtles may continue to exist in the wild.

Other non-native predators such as the red fox (*Vulpes vulpes*) and coyote (*Canis latrans*) are also of concern for sea turtle nests and hatchlings. Red fox are not native to the coastal habitats of the Florida panhandle and have been introduced to the area by fox hunters. They also

compete with the native gray fox (*Urocyon cinereoargenteus*) for habitat. Tracks of coyote and fox have been observed around marked (for identification) sea turtle nests throughout northwest Florida (Daniel et al. 2002). Sea turtle nest survey groups have observed fox waiting at sea turtle nests and picking up hatchling turtles as they emerged (Maxwell 1998 pers. comm.).

Predators of sea turtle nests and hatchlings on Eglin, SRI have included raccoon, coyote, red fox, ghost crabs, and fire ants. Documented depredation rates on Eglin increased from 10 percent of the loggerhead nests in 1993 to 67 percent of the loggerhead nests in 1997. An intensive integrated predator control approach was implemented on the island during the 1998 nesting season (Miller 2005a; Eglin 2005a, 2005b). Reduction in predation rates improved slightly in 1998 (54 percent) and by 2001, the rate was reduced to zero percent.

Eglin's program has been part of the State/Federal interagency partnership for protection of threatened and endangered species on coastal public lands in northwest Florida through predator control. The partners have contracted with the U.S. Department of Agriculture to implement the predator control plan since 1997. It has been successful throughout the region. Continued low predation rates of sea turtle nests throughout northwest Florida have been documented. The integrated predator approach begins with protection of the sea turtle nests as soon as they are laid. As nests are located the morning after they are deposited, a hatchling self-releasing flat screen is placed on top of each nest. As needed, direct control of problem predators is also accomplished.

Driving on the Beach

The operation of motor vehicles on the beach affects sea turtle nesting by: interrupting a female turtle approaching the beach; headlights disorienting or misorienting emergent hatchlings; vehicles running over hatchlings attempting to reach the ocean; and vehicle tracks traversing the beach interfere with hatchlings crawling to the ocean. Apparently, hatchlings become diverted not because they cannot physically climb out of the rut (Hughes and Caine 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon (Mann 1977). The extended period of travel required to negotiate tire tracks and ruts may increase the susceptibility of hatchlings to dehydration and depredation during migration to the ocean (Hosier et al. 1981). Driving directly above or over incubating egg clutches or on the beach can cause sand compaction which may result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings, decreasing nest success and directly killing pre-emergent hatchlings (Mann 1977; Nelson and Dickerson 1987; Nelson 1988).

The physical changes and loss of plant cover caused by vehicles on dunes can lead to various degrees of instability, and therefore encourage dune migration. As vehicles move either up or down a slope, sand is displaced downward, lowering the trail. Since the vehicles also inhibit plant growth, and open the area to wind erosion, dunes may become unstable, and begin to migrate. Unvegetated sand dunes may continue to migrate across stable areas as long as vehicle traffic continues. Vehicular traffic through dune breaches or low dunes on an eroding beach may cause accelerated rate of overwash and beach erosion (Godfrey et al. 1978). If driving is required, the area where the least amount of impact occurs is the beach between the low and high

tide water lines. Vegetation on the dunes can quickly re-establish provided the mechanical impact is removed.

Driving on the beach at Eglin is only allowed for military missions and to implement Eglin's Integrated Natural Resources Management Program (INRMP 2002) including the protection, conservation, management and research of natural resources. In completing formal consultations with Eglin on the INRMP in 1999, the Service has included protocol for driving on the beach during sea turtle nesting season.

Sea Turtle Strandings

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) leads the Sea Turtle Stranding and Salvage network (STSSN). In Florida, strandings are documented by the Fish and Wildlife Research Institute (FWC/FWRI) staff biologists and by a network of permitted participants located around the state. Since the start of the program in 1980, loggerhead strandings (dead or debilitated turtles) documented by the Florida STSSN have increased significantly over the period from 1989 to 2005 with the two highest yearly totals occurring in 2003 and 2005.

Eglin participates in the State of Florida Sea Turtle Stranding and Salvage Network (STSSN) and completes and submits STSSN reports as appropriate. From 1989 through October 2005, 73 sea turtles were documented to strand on Eglin beaches or Gulf front lands. Average annual strandings are approximately 5 per year (range 1 to 10). The species that were stranded included: loggerhead (43), leatherback (11), ridley (7), green (7), and unidentified (5). Strandings found on the public beaches of Eglin were nearest Site A-1 (nine) and Site A-3 (five). The majority of the strandings were located on the restricted-access portions of the island near Site A-10. Ten strandings were on the shoreline of Choctawhatchee Bay within the boundaries of Eglin (Miller 2005b). The overall number of strandings reported for Eglin continues to be above average from previous years (<http://research.myfwc.com>).

Other Threats

Loggerhead Sea Turtle

Anthropogenic (human) factors that impact hatchlings and adult female turtles on land, or the success of nesting and hatching include: beach erosion, armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, feral hogs, dogs, and an increased presence of native species (*e.g.*, raccoons, armadillos, and opossums), which raid and feed on turtle eggs. Although sea turtle nesting beaches are protected along large expanses of the western North Atlantic coast, other areas along these coasts have limited or no protection.

Loggerhead turtles are affected by a completely different set of anthropogenic threats in the marine environment. These include oil and gas exploration and transportation; marine pollution;

underwater explosions; hopper dredging, offshore artificial lighting; power plant entrainment and/or impingement; entanglement in debris; ingestion of marine debris; marina and dock construction and operation; boat collisions; poaching, and fishery interactions. In the oceanic environment, loggerheads are exposed to a series of longline fisheries that include the U.S. Atlantic tuna and swordfish longline fisheries, an Azorean longline fleet, a Spanish longline fleet, and various fleets in the Mediterranean Sea (Aguilar et al. 1995; Bolten et al. 1994; Crouse 1999). There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels. In the neritic environment in waters off the coastal U.S., loggerheads are exposed to a suite of fisheries in federal and state waters including trawl, purse seine, hook and line, gillnet, pound net, longline, dredge, and trap fisheries (National Marine Fisheries Service and Service 2007a).

Green Sea Turtle

Threats to nesting and marine habitats continue to affect threatened green turtle populations. Continuing human population expansion into coastal areas is expected to increase the severity of existing threats and is therefore cause for major concern. Green turtles are also highly vulnerable to anthropogenic impacts during all life-stages, and three of the biggest threats result from harvest for commercial and subsistence use (e.g. egg harvest, the harvest of females on nesting beaches, and directed hunting of green turtles in foraging areas), Diseases, particularly Fibropapillomatosis, threaten a large number of existing subpopulations. Fisheries bycatch in artisanal and industrial fishing gear (drift-netting, long-lining, set-netting, pound netting, and trawl fisheries) is also a major impact. In addition, increasing incidence of exposure to heavy metals and other contaminants in the marine environment is of concern in some areas. Additional factors affecting green turtles include boat traffic and its modification of green turtle behavior in coastal areas, boat strikes as a major mortality source in some areas, the ingestion of and entanglement in marine debris that can reduce food intake and digestive capacity, and the interaction with oil spills (National Marine Fisheries Service and Service 2007b).

While endangered green turtle populations have increased, threats to nesting beaches and the marine environment have also increased. Among the most significant threats to nesting habitat in Florida are the structural impacts (e.g. construction of buildings, beach armoring, and beach nourishment) and beachfront lighting. These activities result in direct habitat destruction and degradation decreasing the extent and suitability of nesting sites on Florida beaches (e.g. increased erosion, altered thermal profiles). The high incidence of Fibropapillomatosis disease among some foraging populations is a serious concern. Within U.S. waters, fisheries bycatch of Florida green turtles remains a threat. Human threats (e.g. directed killing, fisheries bycatch) outside of Florida may have profound impacts on the Florida breeding population because of the dispersal of Florida green turtles to juvenile foraging areas throughout the wider Caribbean and GOM. Vessel strikes are a growing concern and, as human populations increase in coastal areas, vessel strikes are likely to increase (National Marine Fisheries Service and Service 2007b).

Kemp's Ridley Sea Turtle

While the increases documented at nesting beaches are extremely encouraging and a testament to the commitments of the two nations (Mexico and the U.S.) primarily entrusted with conservation of the species, Kemp's ridleys, like other sea turtles, continue to face numerous threats. These threats include incidental capture in shrimp trawl and other coastal fisheries, coastal development and expanding human populations adjacent to important nesting beaches, degradation of coastal foraging habitats, and other potential effects of global warming on sex ratios (National Marine Fisheries Service and Service 2007d).

All Sea Turtles

Coastal Development

Loss of nesting habitat related to coastal development has had the greatest impact on nesting sea turtles in this region. Beachfront development not only causes the loss of suitable nesting habitat but can result in the disruption of powerful coastal processes accelerating erosion and interrupting the natural shoreline migration (National Research Council 1990b). This may in turn cause the need to protect upland structures and infrastructure by armoring, groin placement, beach berm construction, and beach nourishment which cause changes in, additional loss or impact to the remaining sea turtle habitat.

Armoring

Coastal armoring in Florida is allowed in efforts to protect public infrastructure and private upland structures because of exposure to high frequency storm events and extreme or critical erosion of the coastal shoreline. This erosion can be a result of normal erosional forces, upstream perturbations (inlets, navigation channels, groins, etc.), disasters or weather events. Armoring may be accomplished as a permanent measure permitted in accordance with 161.085 Florida Statutes and 62.33B Florida Administrative Code or a temporary emergency measure provided a local government has invoked the State of Florida emergency armoring provision under 161.085 Florida Statutes and 62.33B Florida Administrative Code.

Responding to erosion depends on whether the erosion is continual, temporary, or permanent. In areas where erosion is continual or permanent, some artificial action to offset the erosion is usually needed where infrastructure or structures are at risk. However, activities that stop or minimize the erosion result in a better long term solution for the coastal environment than coastal armoring. Such activities could include modifying navigation channel operation and maintenance, inlet sand bypassing, relocating structures, and conducting beach and dune restoration. Where erosion is temporary and the coastline is expected to recover, it is prudent to use temporary solutions that would not cause additional harm or exacerbate the existing situation on the coastline. This would allow recovery of the coastline and planning of appropriate actions to address the situation.

Due to the extreme erosion events that are necessary to require construction of armoring, most armoring structures are placed within the tidal zone of the sea. The placement of hardened structures within areas of tidal influence results in changes to natural beach processes. These changes can result in accelerated erosion seaward of the hardened structure and adjacent to the structure, especially on the downdrift side (end scour) (Pilkey and Wright 1988; Tait and Griggs 1990). In addition to the fact that an armoring structure creates a physical obstacle, the interaction between an armoring structure and the hydrodynamics of tide and current often results in the alteration of the beach profile seaward and in the immediate vicinity of the structure (Pilkey and Wright 1988; Terchunian 1988; Tait and Griggs 1990; Plant and Griggs 1992) including increased erosion seaward of structures, increased longshore currents that move sand away from the area, loss of interaction between the dune and ocean, and concentration of wave energy at the ends of an armoring structure (Schroeder and Mosier 1996).

Hurricanes

Hurricanes were probably responsible for maintaining coastal beach habitat upon which sea turtles depend through repeated cycles of destruction, alteration, and recovery of beach and dune habitat. Hurricanes generally produce damaging winds, storm tides and surges, and rain and can result in severe erosion of the beach and dune systems. Overwash and blowouts are common on barrier islands. Hurricanes and other storms can result in the direct or indirect loss of sea turtle nests, either by erosion or washing away of the nests by wave action or inundation or “drowning” of the eggs or hatchlings developing within the nest or indirectly by loss of nesting habitat. Depending on their frequency, storms can affect sea turtles on either a short-term basis (nests lost for one season and/or temporary loss of nesting habitat) or long term, if frequent (habitat unable to recover). How hurricanes affect sea turtle nesting also depends on its characteristics (winds, storm surge, rainfall), the time of year (within or outside of the nesting season), and where the northeast edge of the hurricane crosses land.

Because of the limited remaining nesting habitat, frequent or successive severe weather events could threaten the ability of certain sea turtle populations to survive and recover. Sea turtles evolved under natural coastal environmental events such as hurricanes. The extensive amount of pre-development coastal beach and dune habitat allowed sea turtles to survive even the most severe hurricane events. It is only within the last 20 to 30 years that the combination of habitat loss to beachfront development and destruction of remaining habitat by hurricanes has increased the threat to sea turtle survival and recovery. On developed beaches, typically little space remains for sandy beaches to become re-established after periodic storms. While the beach itself moves landward during such storms, reconstruction or persistence of structures at their pre-storm locations can result in a major loss of nesting habitat.

The 2004 hurricane season was the most active storm season in Florida since weather records began in 1851. Hurricanes Charley, Frances, Ivan, and Jeanne, along with Tropical Storm Bonnie, damaged the beach and dune system, upland structures and properties, and infrastructure in the majority of Florida’s coastal counties. The cumulative impact of these storms exacerbated erosion conditions throughout the state.

The 2005 hurricane season was a record breaking season with 27 named storms. Florida was impacted by Hurricanes Dennis, Katrina, Ophelia, Rita, and Wilma, and Tropical Storms Arlene and Tammy. The cumulative impact of these storms exacerbated erosion conditions in south and northwest Florida.

Erosion

Erosion problems on SRI have been particularly substantial on the GOM shoreline. Approximately 2.0 miles of U.S. Hwy 98 washed out as a result of Hurricane Opal (1995), Hurricane Ivan (2004), and Hurricane Dennis (2005). Following Hurricane Opal, Eglin instituted a large scale dune building program and was successful in the creation of a strong dune system that lasted until Hurricane Ivan. Hurricane Dennis eroded the few remaining post-Ivan dunes. In addition, erosion of SRI has been accelerated by the construction of inlet jetties for the East Pass in 1967-1969. The beach for approximately 20,000 feet west of East Pass is highly erosive. Erosion rates range from -1.0 to -8.5 feet/year.

Beachfront Lighting

Artificial beachfront lighting may cause disorientation (loss of bearings) and misorientation (incorrect orientation) of sea turtle hatchlings. Visual signs are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr 1967; Mrosovsky and Shettleworth 1968; Dickerson and Nelson 1989; Witherington and Bjorndal 1991). Artificial beachfront lighting is a documented cause of hatchling disorientation and misorientation on nesting beaches (Philibosian 1976; Mann 1977; FWC summary of lighting disorientations statewide 1999-2006). The emergence from the nest and crawl to the sea is one of the most critical periods of a sea turtle's life. Hatchlings that do not make it to the sea quickly become food for ghost crabs, birds, and other predators or become dehydrated and may never reach the sea. Some types of beachfront lighting attract hatchlings away from the sea while some lights cause adult turtles to avoid stretches of brightly illuminated beach. Research has documented significant reduction in sea turtle nesting activity on beaches illuminated with artificial lights (Witherington 1992). During the 2006 sea turtle nesting season in Florida, over 71,000 turtle hatchlings were disoriented.

Exterior lighting associated with condominiums had the greatest impact causing disorientation/misorientation of 35 percent. Other causes included condominium interior lights, urban sky glow and street lights (http://www.myfwc.com/seaturtle/Lighting/Light_Disorient.htm).

Beach nourishment projects create an elevated, wider and unnatural flat slope berm (beach). Sea turtles nest closer to the water the first few years after nourishment because of the altered profile (and perhaps unnatural sediment grain size distribution) (Ernest and Martin 1999; Trindell 2005).

The newly created wider and flatter beach berm exposes sea turtles and their nests to lights that were less visible, or not at all visible, from nesting areas before the beach nourishment. Review of over 10 years of empirical information from beach nourishment projects indicates that the number of sea turtles impacted by lights increases on the post-construction berm. A review of

selected nourished beaches in Florida (South Brevard, North Brevard, Captiva Island, Ocean Ridge, Boca Raton, Town of Palm Beach, Longboat Key, and Bonita Beach) indicated disorientation reporting increased by approximately 300% (± 282 std. dev.) the first nesting season after project construction and up to 542% (+ 872 std. Dev.) the second year compared to pre-nourishment reports (Trindell et al. 2005) (**Figure 5**).

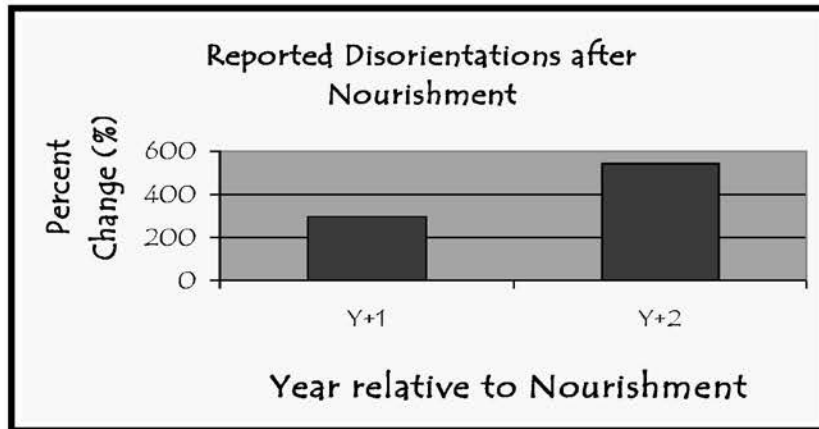


Figure 5. Reported disorientations from seven nourished beaches compared to pre-nourishment.

Specific examples of increased lighting disorientations after beach nourishment include examples from projects in Brevard and Palm Beach counties, Florida. A nourishment project in Brevard County, completed in 2002, showed an increase of 130 percent in disorientations in the nourished area. Disorientations on beaches in the County that were not nourished remained constant (Trindell 2007 pers. comm.). This same result was also documented in 2003 when another beach in Brevard County was nourished and the disorientations increased by 480 percent (Trindell 2007 pers. comm.). Installing appropriate beachfront lighting is the most effective method to decrease the number of disorientations on any developed beach including nourished beaches.

A shoreline protection project was constructed at Ocean Ridge in Palm Beach County, Florida between August 1997 and April 1998. Lighting disorientation events increased after nourishment. In spite of continued aggressive efforts to identify and correct lighting violations in 1998 and 1999, 86 percent of the disorientation reports were in the nourished area in 1998 and 66 percent of the reports were in the nourished area in 1999 (Howard and Davis 1999).

While the effects of artificial lighting have not been specifically studied on each beach that is nourished in Florida, based on the experience of increased artificial lighting disorientations on other Florida beaches, we expect those impacts to potentially occur on all nourished beaches statewide.

Changing to sea turtle compatible lighting can be easily accomplished at the local level through voluntary compliance or by adopting appropriate regulations. Of the 64 coastal counties in Florida, 17 have passed beachfront lighting ordinances in addition to 49 municipalities. Local governments have realized that adopting a lighting ordinance is the most effective method to address artificial lighting along the beachfront.

In 2001, the Eglin Natural Resources received funding to convert/replace the remaining lights on SRI Air Force property to low pressure sodium lighting. Low pressure sodium lighting minimizes the risk of disorientation of sea turtles. Eglin has installed low pressure sodium vapor lighting at all test sites along SRI. Eglin continues to ensure that all Eglin-associated lighting visible from the beach is minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water surface and nesting beach.

Eglin NRS documented sixteen accounts of disorientation from September 2001 through August 2007. The direction of disorientation is primarily to the north with the lighting source documented as the following:

- Sky glow and general urban light pollution
- Beach condo exterior lights
- AF test site lighting
- Parking lot lights
- Automobile lights

The numbers of disoriented turtles ranged from 1 to 93 with an average of 26 turtles being disorientated per event. Very few turtles have been documented as dead due to disorientation; however, for each disorientation event, 19 turtles were found dead.

Analysis of the species/critical habitat likely to be affected

The northwest Florida loggerhead sea turtle nesting subpopulation has significantly declined in nesting based on data analyzed by the State of Florida from 1997 to 2006. While all turtle nesting beaches are adequately surveyed following standard operating procedures and management is in place on most beaches, nest numbers continue to decrease. The prevailing thought is that the primary reason for the current overall decline of loggerhead sea turtles is incidental catch in commercial fishing (longline, drift and set gillnets, and pots/traps) in the nearshore and open waters. A variety of factors have been indicated to contributing to the decline of nesting: including loss and degradation of nesting habitat from coastal development and associated activities (armoring, nourishment, lighting, predation, and increased human presence on the beach at night). In recent years, survival and success of nest hatching has been affected by severe weather events. In contrast the numbers of green and leatherback sea turtle nests have increased in Florida.

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ENVIRONMENTAL BASELINE**Status of the species within the action area**

Eglin implements guidelines/regulations to address conservation and management of sea turtles on Santa Rosa Island (INRMP 2002; Eglin 2005a; Eglin 2005b). Eglin initiated conservation and management of sea turtles on base controlled lands in 1987. The monitoring is conducted under State of Florida permit no. 076/161 (Fish and Wildlife Conservation Commission statewide nesting database). Nesting surveys are conducted seven days a week from May 1 to September 1. Nest hatching surveys may continue into mid-November depending on nest incubation. Eglin participates in the State's INBS program. The beachfront is divided into one-half mile segments for reporting purposes. Surveys begin at sunrise. Approximately 17 miles of Santa Rosa Island are surveyed by using all-terrain vehicles (ATVs). Turtle crawls are identified as a true nesting crawl or false crawl. Nests are marked with stakes and surrounded with surveyor flagging tape, and if needed screened to prevent predation. The marked nests are monitored throughout the incubation period for storm damage, predation, hatching activity and hatch and emergence success. Nests are relocated if threatened by erosion or inundation or required as part of consultation with the Service. Nests are relocated within the first 12 hours of being deposited, or before 9 a.m. the morning following deposition.

Based on data collected between 1989 and 2007 on the seventeen miles of Eglin SRI beaches (Action Area), the average annual nesting density for loggerheads is approximately 1.19 nests per mile. Figure 7 provides a comparison of nesting density on panhandle beaches for the years 1993 to 2006. During this period, 383 loggerhead nests were recorded. Peak loggerhead nesting on SRI occurs in June and July, with approximately 86.1 percent of nests established during this period. The average nest incubation length is 67 days. Loggerhead hatching peaks in August and September. The average annual nest emergence success rate is 55.7 percent. Similar to the trends observed throughout Florida and in the panhandle nesting population, the number of loggerhead sea turtles nesting on Eglin has declined since 1993 (statistically significant negative correlation Simple Linear Regression, Prob=0.0034, SAS Inc. 2007).

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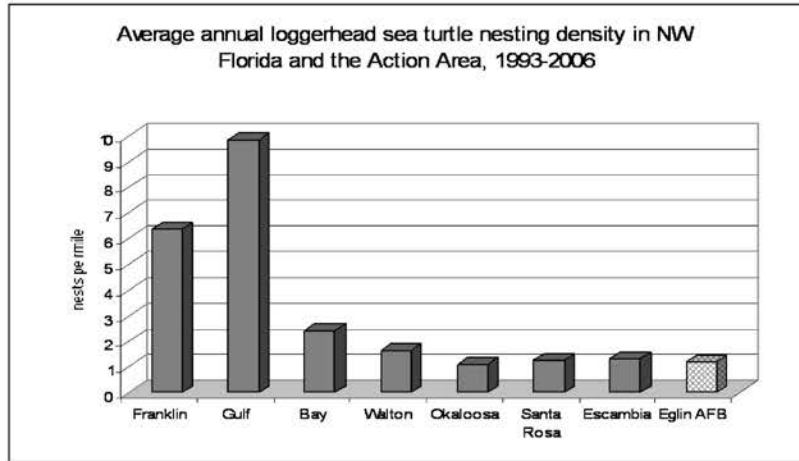


Figure 6. Average annual loggerhead sea turtle nesting density in northwest Florida and the Action Area from 1993 to 2006.

Eglin’s SRI supports the greatest number of green sea turtle nests in northwest Florida. Green sea turtles have been documented to nest on SRI every other year from 1990 to 2002. However, in 2003 there were four green sea turtle nests, in 2004 there were none, in 2005 there were seven, in 2006 there were six and in 2007 there were seven, possibly indicating a new trend. Also, there was one nest in 1997. From 1997 to 2007, 120 green sea turtle nests were recorded on SRI. The average annual nesting density for green sea turtles is approximately 0.59 nests per mile (Figure 7). Peak green sea turtle nesting occurs in June and July, with approximately 81 percent of nests established during this period. The average nest incubation length is 69 days, with a range from 51 to 82 days. Green sea turtle hatching peaks in August and September. The average annual nest emergence success rate is 54 percent. While the numbers of green sea turtle nests have increased in Florida there is not a significant trend in the nest numbers at Eglin over time.

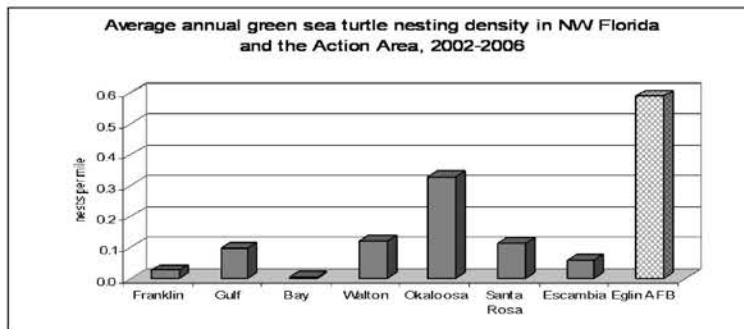


Figure 7. Average annual green sea turtle nesting density in northwest Florida and the Action Area from 2002 to 2006.

Kemp's ridley nests have been confirmed on adjacent beaches and other western panhandle beaches (Navarre and Perdido Key), thus, there is a higher likelihood of Kemp's ridley nesting to occur on Eglin when compared to other areas in the State.

Factors affecting species environment within the action area

Artificial Beachfront Lighting

Beachfront lighting management has been implemented for military controlled facilities on SRI. The largest sky glow contributor for SRI originates from Ft. Walton Beach north of Santa Rosa Sound and this causes the greatest number of disorientations. Other noted causes include lighting from beachfront development (condominiums, restaurants, and hotels), base housing across the Sound on Hurlburt Field, and lights at Test Sites A-4, A-10, and A-11 (FWC/Florida Fish and Wildlife Research Institute Marine Turtle Hatchling Disorientation Incident Report Forms, 1993 to 2004).

Weather Events

The 2004 hurricane season was the most active storm season in Florida since weather records began in 1851. Hurricanes Charley, Frances, Ivan, and Jeanne, along with Tropical Storm Bonnie, damaged the beach and dune system, upland structures and properties, and infrastructure in the majority of Florida's coastal counties. The cumulative impact of these storms exacerbated erosion conditions throughout the state. With the impact of Hurricane Ivan along the northern Gulf of Mexico coast, segments in Escambia (1.2 miles), Santa Rosa (0.7 mile), Okaloosa (2.8 miles), Walton (5.1 miles), and Gulf (0.5 mile) counties were added to the State list of critically eroded beaches.

The 2005 hurricane season was a record breaking season with 27 named storms. Florida was impacted by Hurricanes Dennis, Katrina, Ophelia, Rita, and Wilma, and Tropical Storms Arlene and Tammy. The cumulative impact of these storms exacerbated erosion conditions in south and northwest Florida. In northwest Florida, following the impact of Hurricane Dennis along with additional fringe impacts of Hurricanes Katrina and Rita, critically eroded segments were added in Okaloosa (1.6 miles), Walton (2.4 miles), Gulf (2.4 miles), and Franklin (7.4 miles) counties. However, segments were not added until 2007 for Perdido Key, Escambia County.

Hurricane Dennis in 2005 was one of the most destructive hurricanes to impact Florida's Panhandle coast in recorded history, and has been compared to preceding severe storms like Hurricane Ivan and Opal. After reaching Category 4 strength in the northern GOM as it approached the Florida Panhandle coast, Dennis made landfall east of Pensacola Beach, Florida, near Navarre Beach in the early afternoon of July 10, 2005, as a Category 3 hurricane with wind speeds reported at 115-120 m.p.h.

The continual effects of increased tidal surges and the frequency of storms have caused beach erosion, dune damage, and structure damage on SRI, Eglin. Sea turtles nests were lost from tidal

inundation or wave action and were subjected to changed beach profiles and sand characteristics, eroded beaches, physical barriers, and disturbance from humans.

Other federal actions affecting the action area

In accordance with the Act, the Service completes consultations with all federal agencies for actions that may adversely affect sea turtles (**Table 2**). In northwest Florida, consultations have included military missions, testing, and operations, oil and gas exploration, and navigation channel, beach nourishment and other shoreline protection, and actions related to protection of coastal development on sandy beaches.

Table 2. Previous biological opinions within northwest Florida that have been issued for all projects that had the potential to cause adverse impact to nesting sea turtles.

SPECIES Loggerhead, green, leatherback, and Kemp's ridley sea turtles	YEAR	IMPACT (Habitat/critical habitat/individuals)
Tyndall Air Force Base mission related driving on the beach	1998	18 miles
Panama City Beach beach nourishment original and Amd. 1-8	1998, 2001- 2007	16 miles
Lake Powell Emergency Opening	1998- 2008	1,500 ft
Destin Dome OCS offshore oil and gas drilling	2000	No take
East Pass re-opening	2001	2 miles
Eglin AFB porous groin within season	2001	3,390 ft.
City of Mexico Beach sand bypass system	2001- 2007	3,700 ft.
Eglin AFB INRMP	2002- 2007	17 miles
Eglin 737 Sensor Test Site 13-A SRI	2002	0.12 mile
Pensacola Beach nourishment original Amd. 1	2002- 2005	8.3 miles CC - 14 nests CM - 1 nest DC - 1 nest LK - 1 nest
Eglin Marine Expeditionary Unit Training	2003	17 miles
Eglin AFB U.S. Army Ranger Los Banos	2003	7miles
Walton County-Destin beach nourishment phase 1	2004	6.7 miles CC -11 nests CM - 1 nest DC - < 1 nest LK - < 1 nest
Eglin AFB Advance Skills Training	2004	7 miles
Navarre beach nourishment emergency consultation and amd. 1-6	2005	4.1 miles

SPECIES	YEAR	IMPACT (Habitat/critical habitat/individuals)
Loggerhead, green, leatherback, and Kemp's ridley sea turtles		
Tyndall AFB INRMP	2006- 2008	18 miles
Western Lake Emergency Opening	2006	0.5 mile
St. Joseph Peninsula beach restoration and amd 2	2007- 2008	7.5 miles
Alligator Point beach restoration	2007	2,500 ft
Eastern Lake Emergency Opening	2007	0.5 mile
Panama City Harbor	2003- 2008	500 ft – 1 mile
FEMA FL Statewide Emergency Berms	2008	50 miles
Shore Protection Activities along the Coast of Florida	2011	statewide

EFFECTS OF THE ACTION

The proposed changes to the use of SRI for testing and training purposes will occur within habitat that is used by sea turtles for nesting and may occur during some or all of sea turtle nesting season. Long-term and permanent impacts could include direct mortality of nesting turtles or hatchlings during training exercises, and/or harassment of nesting turtles during the nesting season. Short-term and temporary impacts to sea turtle nesting activities could result from project activities occurring on the nesting beach during the active nesting or hatching period, changes in the physical characteristics of the beach from some of the activities planned on the island.

Factors to be considered

Proximity of action: The action area generally included the landmass of Santa Rosa Island plus 30 feet gulfside from the water line.

Distribution of activities: Training and testing is expected to occur in all areas of Santa Rosa Island with the following exceptions:

- Piping plover designated critical habitat
- Vegetated dune habitat higher than 5 feet of elevation.
- Areas containing perforate lichen (*Cladonia perforata*)

It is not expected that all other areas available will be used at all times.

Timing: Sea turtle nesting season occurs between May 1 and October 31 of each year. Testing and training activities could occur at any time. When possible, training and testing will be scheduled outside of the nesting season.

Nature of the effect: The impacts caused by the actions included in the training and testing projects described in the biological assessment will likely result in harassment and in some cases outright killing of nesting sea turtles, their hatchlings, and or nests. Electronic countermeasures, small arms fire, mine and obstacle placement and clearing, nighttime missions, artificial lighting, pyrotechnics, and others all could cause nesting attempts to fail, disorientation of hatchlings and nesting females, or direct injury and mortality.

Disturbance Frequency: The training and testing could occur at any time during the year. Frequency of events is undetermined. Avoidance and minimization measures are in place to reduce, to the extent practicable, the effects on listed species while still satisfactorily allowing the military mission to be conducted.

Analyses for effects of the action

The effects of training and testing activities on SRI include both short term and long term effects on nesting sea turtles, their nests, and hatchlings. Short-term effects mainly stem from training exercises using vehicles and on foot, live fire training, pyrotechnics, and deployment training. Long-term impacts to the beach environment will likely affect sea turtles over time by altering habitat, or causing harm/harassment on a fairly continuous basis.

Direct Effects

Direct effects are those effects that have immediate and direct effect on the species or its habitat. The nature of the testing and training projects proposed on SRI will likely have direct effects on the nesting turtles, nests, and/or hatchlings, particularly when training is expected year round and for years to come. While the frequency of direct effects may be relatively low, these are likely to happen over the extended duration of the proposed action. These impacts are expected as a result of one or more of the following planned activities including but not limited to: troop presence, vehicles, watercraft (amphibious) helicopter drops/extractions, live fire exercises, inert mine placement and extraction, placement and removal of obstacles in the beach environment, pyrotechnics, and nighttime lighting. It should be noted that these effects are what is expected after avoidance and minimization measures are in place. Effect determinations and incidental take estimates are developed with the expectation of full implementation of avoidance and minimization.

Specific effects of the various testing and training activities include, but are not limited to, direct harm from moving vehicles, sand compaction, small explosives, the process of relocation of at-risk nests, and noise.

Troop presence: The presence of soldiers and other personnel in the beach dune environment, particularly at night during nesting season, or during a hatchling emergence could result in harm or death to individual turtles or hatchlings. Training exercises require concentration and often involve inherently dangerous activities. A nesting sea turtle or emerging hatchling could be overlooked and injured/killed by unintentional, yet unavoidable, situations on the beach.

Vehicles: The use of vehicles in amphibious assaults, troop transport, helicopter landing/extraction, search and rescue, and unmanned vehicle use all have the potential of injuring or killing nesting adults and emerging hatchlings. Heavier vehicles have the potential to compact sand that may affect hatchlings ability to reach the surface or create ruts that entrap hatchlings after emergence.

Live fire exercises: During training missions soldiers and vehicles will occasionally operate small and medium arms using live ammunition. Live fire exercises are inherently dangerous and spent ammunition could injure or kill sea turtles and hatchlings, particularly at night. While live fire will be in designated areas only, the potential for a sea turtle to approach the area could still result in harm to individuals.

Disturbance Frequency: This consultation covers any time of year. However, Eglin AFB has implemented avoidance and minimization measures to reduce the effects of the actions described in the biological assessment. The nature of training episodes precludes precise training dates, resulting in training frequency being speculative. The history of the island's use shows training frequency to be relatively low. However, since training may occur during the nesting season, the frequency of training during this time will be carefully assessed.

Indirect Effects

Indirect effects are those effects that are caused by, or result from, the proposed action, are later in time, and are reasonably certain to occur. Effects of the proposed action have the potential to affect sea turtles nesting on the project area beaches in the future and constitute indirect effects.

Increased Susceptibility to Catastrophic Events: The biological assessment recommends relocation of some sea turtle nests that are deposited within certain areas where their likelihood of being directly impacted is considered much higher. Nevertheless, relocation of nests, however well intentioned, has the potential to negatively impact hatchling survival. Nest relocation may concentrate eggs in an area making them more susceptible to catastrophic events should that area succumb to such an event. Hatchlings released from concentrated areas also may be subject to greater predation rates from both land and marine predators, because the predators learn where to concentrate their efforts (Glenn 1998; Wyneken et al. 1998).

Driving on the beach for project work: The operation of motor vehicles or equipment on the beach to complete the project work at night affects sea turtle nesting by: interrupting a female turtle approaching the beach; headlights disorienting or mis-orienting emergent hatchlings; vehicles running over hatchlings attempting to reach the ocean; and vehicle tracks traversing the beach interfere with hatchlings crawling to the ocean. Apparently, hatchlings become diverted not because they cannot physically climb out of the rut (Hughes and Caine 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon (Mann 1977). The extended period of travel required to negotiate tire tracks and ruts may increase the susceptibility of hatchlings to dehydration and depredation during migration to the ocean (Hosier et al. 1981). Driving directly above or over incubating egg clutches or on the

beach can cause sand compaction which may result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings, decreasing nest success and directly killing pre-emergent hatchlings (Mann 1977; Nelson and Dickerson 1987; Nelson 1988).

Changes in the physical environment: Beach nourishment may result in changes in sand density (compaction), beach shear resistance (hardness), beach moisture content, beach slope, sand color, sand grain size, sand grain shape, and sand grain mineral content if the placed sand is dissimilar from the original beach sand (Nelson and Dickerson 1988a). These changes could result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings (Nelson and Dickerson 1987; Nelson 1988). The Florida Department of Environmental Protection will determine if the dredged material to be placed on the beaches meet the State's criteria under 62B-41.007, Florida Administrative Code, for beach placement.

Beach compaction and unnatural beach profiles that may result from beach nourishment activities could negatively impact sea turtles regardless of the timing of projects. Very fine sand and/or the use of heavy machinery can cause sand compaction on nourished beaches (Nelson et al. 1987; Nelson and Dickerson 1988a). Reductions in nesting success (i.e., false crawls occurred more frequently) have been documented on severely compacted nourished beaches (Fletemeyer 1980; Raymond 1984; Nelson and Dickerson 1987; Nelson et al. 1987), and increased false crawls may result in increased physiological stress to nesting females. Sand compaction may increase the length of time required for female sea turtles to excavate nests and could increase physiological stress to the animals (Nelson and Dickerson 1988b). Nelson and Dickerson (1988c) concluded that, in general, beaches nourished from offshore borrow sites are harder than natural beaches, and while some may soften over time through erosion and accretion of sand, others may remain hard for 10 years or more.

These impacts can be minimized by using suitable sand and by tilling compacted sand after project completion. The level of compaction of a beach can be assessed by measuring sand compaction using a cone penetrometer (Nelson 1987). Tilling of a nourished beach with a root rake may reduce the sand compaction to levels comparable to unnourished beaches. However, a pilot study by Nelson and Dickerson (1988c) showed that a tilled nourished beach will remain un-compacted for up to one year. Multi-year beach compaction monitoring and, if necessary, tilling would ensure that project impacts on sea turtles are minimized. The project incorporates post-project compaction sampling and tilling as needed.

A change in sediment color on a beach could change the natural incubation temperatures of nests in an area, which, in turn, could alter natural sex ratios. To provide the most suitable sediment for nesting sea turtles, the color of the nourished sediments must resemble the natural beach sand in the area. Natural reworking of sediments and bleaching from exposure to the sun would help to lighten darker sediments used for nourishment projects; however, the timeframe for sediment mixing and bleaching to occur could be critical to a successful sea turtle nesting season.

Species' response to a proposed action

As stated in other sections of this biological opinion, the myriad of testing and training activities will have varying degrees of effects on nesting sea turtles, their nests, and hatchlings. After all avoidance and minimization measures are in place, there remains the likelihood that individuals, nests and hatchlings can be harmed or killed in the performance of the proposed actions.

Numbers of individuals in the action area: Typically SRI averages approximately 19.2 loggerhead nests per year, and 9.3 green turtle nests per year. Data are insufficient to calculate averages for leatherback and Kemp's ridley turtles. Over 80% of the annual nests are laid in the two peak months of June and July. According to data collected and reported in their biological assessment, loggerhead nests average 110 eggs per nest and green turtles average 138 eggs per nest. Slightly over 52% of the nests have emergences of hatchlings. Eglin estimates approximately 2100 loggerhead and 1300 green hatchlings produces annually (assuming 100% survival).

Species sensitivity to change: In general, the impacts from training missions will be episodic and will affect individual turtles, nests, and hatchlings. Little is known about how the loggerhead and green turtles will respond to the changes, other than that individuals could be killed, harmed, and/or disoriented by the various actions occurring in the beach habitat. Sea turtles that survive the hatching stage and reach adulthood, typically return to the nesting beaches where they hatched. This future impact resulting from impacted hatchling not being available to return at maturity cannot be estimated with any reasonable certainty. Therefore, the effects analysis here is focused primarily on immediate and direct impacts from the testing and training covered in this opinion.

Species resilience: Sea turtles in general have shown tremendous resilience in continuing to attempt to nest on disturbed beaches. While the animals may demonstrate significant resilience on an individual level, the populations of the various species of sea turtles been reduced, available nesting beaches have decreased, and elevated mortality has been observed. The evolutionary history of the reproductive strategy of sea turtles has an inherent way of dealing with challenges in the natural environment under natural conditions. However, anthropogenic stressors imposed on sea turtles such as beach development, recreation on coastal environments, overfishing, etc. continually increases and tests the resilience of the sea turtle.

Species recovery rate: The high reproductive output of sea turtles may provide for a recovery of populations within the foreseeable future if negative impacts are pressures impacting sea turtle populations may result in.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. This project occurs on federal lands. Military missions (training and testing) on SRI and INRMP are covered under existing programmatic consultations. Future Federal actions that are unrelated to the

proposed project, not covered in the existing programmatic consultation for SRI or the INMRP would require separate consultation pursuant to section 7 of the Endangered Species Act.

It is reasonably certain to expect that coastal development, human occupancy and recreational use along the Gulf Coast of Florida will increase in the future. Redevelopment along with new developments following the hurricane seasons of 2004, and 2005, occurs as allowed by local zoning standards. Any projects that are within endangered or threatened species habitat will require section 7 or 10 permitting from the Service.

Eglin NRB oversees natural resource management of SRI and has implemented regular monitoring surveys to document military mission impacts on the natural resources at SRI.

Florida continues to be a rapidly growing state. One estimation was approximately one thousand people per day are moving to the state. Coastal development is expected to continue to reduce available beach habitat for sea turtle nesting and other sensitive coastal species. The frequency of beach renourishment projects continues to increase, which could have very serious long term effects on the nesting beaches by potentially changing beach chemistry, grain size, color, compaction, and available area. Islands like SRI and other coastal lands in public ownership will likely become increasingly important as dark nesting beaches.

Increasing human population and as yet unrealized effects from climate change will likely have significant effects on nesting sea turtle populations. Some models predict drastic sea level rise that is projected to reduce the amount of available nesting habitat by great margin.

CONCLUSION

Sea Turtles

After reviewing the current status of the loggerhead, green, and Kemp's ridley sea turtles, the environmental baseline for the Action Area, the effects of the proposed beach and dune restoration activities, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the loggerhead, green, or Kemp's ridley sea turtles. No critical habitat has been designated for sea turtle species in the continental United States; therefore, none will be affected.

The conservation of the five loggerhead nesting subpopulations is essential to the recovery of the loggerhead sea turtle. Each individual subpopulation is necessary to conserve genetic and demographic robustness, or other features necessary for long-term sustainability of the entire population. The maintenance of viable nesting in each subpopulation's range contributes to the overall population status. This project is within the Florida panhandle population.

There is approximately 1,400 miles of available sea turtle nesting habitat in the southeastern U.S and 234 miles in the panhandle. Of this available nesting habitat, project impacts will occur on 0.36 percent of the nesting habitat statewide and 2.1 percent of the nesting habitat in the panhandle.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation under section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by Eglin Air Force Base so that they become binding conditions of any grant or permit issued to the applicant as appropriate, for the exemption in section 7(o)(2) to apply. Eglin Air Force Base has a continuing duty to regulate the activity covered by this incidental take statement. If Eglin Air Force Base (1) fails to assume and implement the terms and conditions or (2) fails to require any worker on their behalf to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR 402.14(1)(3)]

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The actions contained in the biological assessment for which this consultation is concerned will occur along the 17 mile Gulf of Mexico coastline of Santa Rosa Island. One and one half miles of this beach would be used for relocation efforts as needed.

The Service expects that all nesting loggerhead and green turtles, and their nests throughout the action area (which averages up to twenty loggerhead nests and up to three nesting female adult loggerheads, nine green turtle nests and one green turtle adult, and one Kemp's ridley adult and 1 nest) could be taken as a result of this proposed action per year. The incidental take is expected to be in the form of both direct harm and/or harassment. However, the amount of take in this biological opinion should be viewed as a "worst case" scenario and it is not expected that the allowable take will be used except in the rarest of circumstances. Further, it is important to note that the allowable take is calculated mindful that Eglin follows all of its avoidance and minimization measures outlined in the biological assessment and terms and conditions outlined below.

The level of take is summarized as follows. Based on nesting data from 1989 to the present, SRI has averaged slightly less than 20 loggerhead nests, 9 green turtle nests per year and potentially 1 Kemp's ridley adult.

The Service expects complete monitoring of incidental take of sea turtle species within the action area will be difficult following reasons: Sea turtles could be buried and or wash out with the tide and avoid detection. Additionally, some training techniques, including maneuvers occurring at night, may result in adults or hatchlings being overlooked resulting in sea turtles being killed or harmed without being seen.

Table 3. The estimated number of individuals and amount of critical habitat affected for the proposed project, based on the best available commercial and scientific information.

SPECIES	INDIVIDUALS* <i>And nests</i>	TAKE TYPE	CRITICAL HABITAT DESTROYED
Loggerhead turtle	20 nests, 3 adults	Harm and harass	No
Green turtle	9 nests, 1 adult	Harm and Harass	No
Kemp's Ridley	1 adult	Harm and Harass	No

Table 4. How the incidental take will be monitored.

SPECIES	CRITICAL HABITAT	HABITAT	OTHER
Loggerhead turtle	No	Standard nesting survey	Pre/post mission survey
Green turtle	No	Standard nesting survey	Pre/post mission survey
Kemp's Ridley	No	Standard nesting survey	Pre/post mission survey

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of expected take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and minimize impacts of incidental take of loggerhead, green, and Kemp's Ridley sea turtles:

1. Avoidance and minimization measures included in the Applicant's BA shall be implemented (unless revised below) for the proposed project. A copy of the BA shall be kept with this biological opinion for reference.
2. Upon locating a sea turtle harmed or destroyed as a direct or indirect result of the project, notification shall be made to the Service and FWC.
3. Lighting associated with the project nighttime activities shall be minimized to reduce the possibility of disrupting and disorienting nesting and/or hatchling sea turtles.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, Eglin AFB must comply with the following terms and conditions, which carry out the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. It is important to note that take of sea turtles allowed under this BO is unintentional and incidental to the action.

1. Prior to each operation with a new user group or change of command for user groups on SRI, mission personnel must receive an NRS-approved environmental briefing and user groups will review the SRI Environmental Guidebook. A record of these briefings will be included in the annual report.
2. Surveys will be required before and after test events or training operations that may affect protected species or sensitive habitat. Areas of known sea turtle or shorebird nesting will be avoided or an appropriate buffer must be posted, depending on mission activity.
3. Test area A-15 and A-15A are to be used (IAW EAFBI 13-212 Chapter 7), attachment 2. Units and activities approved for operations in this area will receive briefings as required for currency of appropriate rules and regulations. Routine, repeat missions operating from A-15 Pad 1 and A-15A Pad 1 north to Santa Rosa Sound will be conducted IAW approved environmental guidelines and scheduled in CSE. Any operations south of A-15 Pad 1 and A-15 Pad 1 to the Gulf of Mexico require NRS coordination.
4. A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Service within 90 days of completion of the proposed work for each year after the end of sea turtle nesting season (Oct 31).
5. In areas where LCAC amphibious landings (A-13B 0.5 mile corridor) would be conducted between May 1 and October 31, Eglin Natural Resources Section must be notified at least 80 days prior to the action in order to relocate any sea turtle nests that occur in that area. All nests within the A-13B landing corridor will be relocated at least 50 feet from the area.

6. During surface to air missile training, Eglin Natural Resource approved personnel will be present during setup and test events during sea turtle nesting season, for daytime or nighttime activities.
7. During surface to air missile training, sea turtle nests would be marked and any hatchlings disoriented by setup activities would be redirected toward the shoreline by Eglin NRS approved personnel. Only persons on Eglin's sea turtle permit would be allowed to interact with sea turtle adults or hatchlings.
8. Live fire will be restricted to designated areas described in the BA.
9. Use of explosives or powerful munitions will be coordinated with Eglin NRS personnel.
10. Adhere to regulations on small arms blank ammunition, debris and hazardous materials for cleanup. Spent cartridges will be collected to the extent practicable. User groups are responsible for cleanup of debris and hazardous materials within 48 hours after test event or training cycles end. Cleanup of debris as described in individual test directives.
11. No daytime (sunrise to sunset) testing or training beachfront activities may begin before completion of daily sea turtle nest survey and protection measures (nest marking or relocation).
12. Between July 1 and October 31, all ruts, holes, or disturbed areas deeper than 2 inches and 2 feet or larger diameter must be removed prior to sunset. All such ruts created during night operations must be removed immediately following operation completion.
13. If a sea turtle is observed on the beach during activities, personnel must remain quiet allowing the turtle to continue her activities. All effort would be made not to obscure the turtle crawl or nest area.
14. Eglin military and civilian personnel will be notified that, upon locating a sea turtle adult, hatchling, or egg that has been harmed or destroyed, contact must be made with the Eglin NRS; a 24 hour emergency contact will be provided to user groups.
15. If hatchling turtles are observed on the beach, all activities would cease until the hatchlings reach their destination. All effort would be made not to obscure the turtle crawls or the nest from where they emerged. Following completion of the activity, Eglin NRS must be contacted to verify the nest hatching.
16. During nighttime beachfront activities between May 1 and October 31: A one-time nesting survey must be conducted by personnel approved by Eglin NRS 2 hours prior to the start of the activity on the portion of the beach where the activity would occur. All nests located during surveys at night must be marked and protected (or relocated where approved) before the nighttime activity begins.

17. During nighttime beachfront activities between May 1 and October 31: If such an event happens to occur in an area where a known nest exists and that nest is beyond day 50 of incubation, provided there is no safety issue from the training activity, and NRS biologist or their designee must be stationed at each nest that is beyond day 50 and within the action area. In the event of a hatching event, the observer will coordinate with training participants and leadership to ensure that hatchlings have unimpeded access to the water.
18. Activities requiring beachfront lighting must be coordinated through NRS to ensure state guidelines for sea turtle lighting are followed. (see Appendix B of the BA).
19. OA-HITL Tower lights, except aviation safety lights will be turned off during sea turtle nesting season.
20. From March 1 to August 31, any nests or colonies of shorebirds found within the test area will be clearly marked and avoided. A reasonable buffer (not less than 300 feet) would be established to protect the nest from disturbance.

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Fish and Wildlife Service Law Enforcement Office in Tallahassee and the Florida Fish and Wildlife Conservation Commission at 1-888-404-3922. Additional notification must be made to the Fish and Wildlife Service Ecological Services Field Office at Panama City at 850 769-0552. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service believes that no more than twenty loggerhead nests and three loggerhead adults, nine green turtle nests and one green turtle adult and one Kemp's ridley nest and one Kemp's ridley adult will be incidentally taken. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

It is important to note in this biological opinion that take is authorized for the numbers and species listed in the above paragraph as an extreme scenario. It is not expected that the amount of take mentioned above would be reached if all terms and conditions, avoidance and minimization measures are properly implemented. If however, the allowable amount of take is reached, it may be that some other factor or set of factors is influencing the expected take amounts and further investigation into the take will be warranted. The RPM's and Terms and Conditions in this document are designed to minimize the amount of unavoidable and unintentional take during the execution of the permitted activities. Adherence to such terms will reduce actual take.

Migratory birds including bald eagles

The Fish and Wildlife Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d), if such take is in compliance with the terms and conditions specified here.

Marine mammals

The Service is not including an incidental take authorization for marine mammals at this time because the incidental take of marine mammals has not been authorized under section 101(a)(5) of the Marine Mammal Protection Act and/or its 1994 Amendments. Following issuance of such regulations or authorizations, the Service may amend this biological opinion to include an incidental take statement for marine mammals.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

1. Eglin AFB management and engineers should consider measures to limit infrastructure located on SRI that would exacerbate coastal erosion and require future storm protection.
2. Eglin AFB lands support approximately 15 percent of the remaining population of the Gulf coast snowy plover, considered a federal species at risk and a State protected species. The habitat that this species relies on for nesting overlaps heavily with the areas proposed for “starter dunes” and associated vegetation planting. Some overlap also occurs with the proposed beachfill and associated dune. To assist the Service in preventing the need to federally protect another coastal dependent species, the Service requests that you take the snowy plover and their habitat needs into consideration prior to placement of the “starter dunes”. This may require a field visit with biologists knowledgeable on snowy plover nesting biology. We encourage consideration of their protection at the required meeting under T&C #3, piping plover protection. We also request consideration of adding additional “notches” at least 25 feet wide in the proposed 5 miles of 13 foot dunes that parallel the beach fill. Snowy plovers prefer to nest where they have some view of the Gulf of Mexico. Adding this wall of sand will reduce the likelihood of nesting behind this 5 mile section of beach.
3. The Santa Rosa beach mouse is considered a federal species at risk. Eglin AFB should seek additional methods of recovering beach mouse habitat on SRI.

4. In order to comply with the MBTA¹ and potential for this project to impact nesting shorebirds, the Eglin's Natural Resource staff or contractors should follow FWC's standard guidelines to protect against impacts to nesting shorebirds during implementation of this project during the periods from February 15-August 31.
5. Additional dune walkovers and parking areas should be constructed where appropriate to protect dune habitats at beach access points.

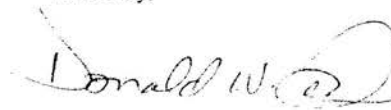
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the conservation recommendations carried out.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the biological assessment. As written in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Eglin AFB involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of Eglin's action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) Eglin AFB's action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease until reinitiation.

For this biological opinion the incidental take would be exceeded when the take exceeds 20 loggerhead nests, 3 loggerhead adults, 9 green turtle nests, 1 green turtle adult, 1 Kemp's ridley nest and 1 Kemp's ridley adult which is what has been exempted from the prohibitions of section 9 by this opinion. The Service appreciates the cooperation of Eglin Air Force Base during this consultation. We would like to continue working with you and your staff regarding testing and training activities on Santa Rosa Island. For further coordination, please contact Harold Mitchell of the Panama City Field Office at (850) 769-0552 ext. 246.

Sincerely,



Dr. Donald W. Imm
Project Leader

¹ The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory bird. Under the provisions of the MBTA it is unlawful "by any means or manner to pursue, hunt, take, capture or kill any migratory bird except as permitted by regulations issued by the Fish and Wildlife Service. The term "take" is not defined in the MBTA, but the Service has defined it by regulation to mean to pursue, hunt, shoot, wound, kill, trap, capture or collect any migratory bird, or any part, nest or egg or any migratory bird covered by the conventions or to attempt those activities.

cc: FWS, Atlanta, GA (Ken Graham) – electronic copy

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APPENDIX 1

Assessments: Discerning Problems caused by Artificial Lighting

Excerpt from:

**Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting
Beaches**

**Florida Wildlife Research Institute Technical Report TR-2
Revised 2003**

Assessments: Discerning Problems caused by Artificial Lighting

WHAT ARE LIGHTING INSPECTIONS?

During a lighting inspection, a complete census is made of the number, types, locations, and custodians of artificial light sources that emit light visible from the beach. The goal of lighting inspections is to locate lighting problems and to identify the property owner, manager, caretaker, or tenant who can modify the lighting or turn it off.

WHICH LIGHTS CAUSE PROBLEMS?

Although the attributes that can make a light source harmful to sea turtles are complex, a simple rule has proven to be useful in identifying problem lighting under a variety of conditions:

An artificial light source is likely to cause problems for sea turtles if light from the source can be seen by an observer standing anywhere on the nesting beach.

If light can be seen by an observer on the beach, then the light is reaching the beach and can affect sea turtles. If any glowing portion of a luminaire (including the lamp, globe, or reflector) is directly visible from the beach, then this source is likely to be a problem for sea turtles. But light may also reach the beach indirectly by reflecting off buildings or trees that are visible from the beach. Bright or numerous sources, especially those directed upward, will illuminate sea mist and low clouds, creating a distinct glow visible from the beach. This "urban skyglow" is common over brightly lighted areas. Although some indirect lighting may be perceived as nonpoint-source light pollution, contributing light sources can be readily identified and include sources that are poorly directed or are directed upward. Indirect lighting can originate far from the beach.

Although most of the light that sea turtles can detect can also be seen by humans, observers should realize that some sources, particularly those emitting near-ultraviolet and violet light (e.g., bug-zapper lights, white electric-discharge lighting) will appear brighter to sea turtles than to humans. A human is also considerably taller than a hatchling; however, an observer on the dry beach who crouches to the level of a hatchling may miss some lighting that will affect turtles. Because of the way that some lights are partially hidden by the dune, a standing observer is more likely to see light that is visible to hatchlings and nesting turtles in the swash zone.

HOW SHOULD LIGHTING INSPECTIONS BE CONDUCTED?

Lighting inspections to identify problem light sources may be conducted either under the purview of a lighting ordinance (see Appendix H and the section below on sea turtle lighting ordinances) or independently. In either case, goals and methods should be similar.

GATHER BACKGROUND INFORMATION

Before walking the beach in search of lighting, it is important to identify the boundaries of the area to be inspected. For inspections that are part of lighting ordinance enforcement efforts, the jurisdictional boundaries of the sponsoring local government should be determined. It will help to have a list that includes the name, owner, and address of each property within inspection area so that custodians of problem lighting can be identified. Plat maps or aerial photographs will help surveyors orient themselves on heavily developed beaches.

PRELIMINARY DAYTIME INSPECTIONS

An advantage to conducting lighting inspections during the day is that surveyors will be better able to judge their exact location than they would be able to at night. Preliminary daytime inspections are especially important on beaches that have restricted access at night. Property owners are also more likely

to be available during the day than at night to discuss strategies for dealing with problem lighting at their sites.

A disadvantage to daytime inspections is that fixtures that are not directly visible from the beach will be difficult to identify as problems. Moreover, some light sources that can be seen from the beach in daylight may be kept off at night and thus present no problems. For these reasons, daytime inspections are not a substitute for nighttime inspections. Descriptions of light sources identified during daytime inspections should be detailed enough so that anyone can locate the lighting. In addition to a general description of each luminaire (e.g., HPS floodlight directed seaward at top northeast corner of the building at 123 Ocean Street), photographs or sketches of the lighting may be necessary. Descriptions should also include an assessment of how the specific lighting problem can be resolved (e.g., needs turning off; should be redirected 90° to the east). These detailed descriptions will show property owners exactly which luminaires need what remedy.

NIGHTTIME INSPECTIONS

Surveyors orienting themselves on the beach at night will benefit from notes made during daytime surveys. During nighttime lighting inspections, a surveyor walks the length of the nesting beach looking for light from artificial sources. There are two general categories of artificial lighting that observers are likely to detect:

1. Direct lighting. A luminaire is considered to be direct lighting if some glowing element of the luminaire (e.g., the globe, lamp [bulb], reflector) is visible to an observer on the beach. A source not visible from one location may be visible from another farther down the beach. When direct lighting is observed, notes should be made of the number, lamp type (discernable by color; Appendix A), style of fixture (Appendix E), mounting (pole, porch, etc.), and location (street address, apartment number, or pole identification number) of the luminaire(s). If exact locations of problem sources were not determined during preliminary daytime surveys, this should be done during daylight soon after the nighttime survey. Photographing light sources (using long exposure times) is often helpful.

2. Indirect lighting. A luminaire is considered to be indirect lighting if it is not visible from the beach but illuminates an object (e.g., building, wall, tree) that is visible from the beach. Any object on the dune that appears to glow is probably being lit by an indirect source. When possible, notes should be made of the number, lamp type, fixture style, and mounting of an indirect-lighting source. Minimally, notes should be taken that would allow a surveyor to find the lighting during a follow-up daytime inspection (for instance, which building wall is illuminated and from what angle?).

WHEN SHOULD LIGHTING INSPECTIONS BE CONDUCTED?

Because problem lighting will be most visible on the darkest nights, lighting inspections are ideally conducted when there is no moon visible. Except for a few nights near the time of the full moon, each night of the month has periods when there is no moon visible. Early-evening lighting inspections (probably the time of night most convenient for inspectors) are best conducted during the period of 2-14 days following the full moon. Although most lighting problems will be visible on moonlit nights, some problems, especially those involving indirect lighting, will be difficult to detect on bright nights.

A set of daytime and nighttime lighting inspections before the nesting season and a minimum of three additional nighttime inspections during the nesting-hatching season are recommended. The first set of day and night inspections should take place just before nesting begins. The hope is that managers, tenants, and owners made aware of lighting problems will alter or replace lights before they can affect sea turtles. A follow-up nighttime lighting inspection should be made approximately two weeks after the first inspection so that remaining problems can be identified. During the nesting-hatching season, lighting problems that seemed to have been remedied may reappear because owners have been forgetful or

because ownership has changed. For this reason, two midseason lighting inspections are recommended. The first of these should take place approximately two months after the beginning of the nesting season, which is about when hatchlings begin to emerge from nests. To verify that lighting problems have been resolved, another follow-up inspection should be conducted approximately one week after the first midseason inspection.

WHO SHOULD CONDUCT LIGHTING INSPECTIONS?

Although no specific authority is required to conduct lighting inspections, property managers, tenants, and owners are more likely to be receptive if the individual making recommendations represent a recognized conservation group, research consultant, or government agency. When local ordinances regulate beach lighting, local government code-enforcement agents should conduct lighting inspections and contact the public about resolving problems.

WHAT SHOULD BE DONE WITH INFORMATION FROM LIGHTING INSPECTIONS?

Although lighting surveys serve as a way for conservationists to assess the extent of lighting problems on a particular nesting beach, the principal goal of those conducting lighting inspections should be to ensure that lighting problems are resolved. To resolve lighting problems, property managers, tenants, and owners should be given the information they need to make proper alterations to light sources. This information should include details on the location and description of problem lights, as well as on how the lighting problem can be solved. One should also be prepared to discuss the details of how lighting affects sea turtles. Understanding the nature of the problem will motivate people more than simply being told what to do.

MONITORING SEA TURTLE BEHAVIOR

In part, the behavior of nesting sea turtles and their hatchlings on the beach can be monitored by studying the tracks they leave in the sand. This evidence can reveal how much and where nesting occurs and how well oriented hatchlings are as they attempt to find the sea from their nest. Monitoring this behavior is one way to assess problems caused by artificial lighting, but it is no substitute for a lighting inspection program as described above. Many lighting problems may affect sea turtles and cause mortality without their leaving conspicuous track evidence on the beach.

SEA TURTLE NESTING

On many beaches, sea turtle biologists make early morning surveys of tracks made the previous night in order to gather information on nesting. With training, one can determine the species of sea turtles nesting, the success of their nesting attempts, and where these attempts have occurred. These nesting surveys are one of the most common assessments made of sea turtle populations.

Because many factors affect nest-site choice in sea turtles, monitoring nesting is not a very sensitive way to assess lighting problems. However, changes that are observed in the distribution or species composition of nesting can indicate serious lighting problems and should be followed with a program of lighting inspections if one is not already in place.

HATCHLING ORIENTATION

Although hatchlings are more sensitive to artificial lighting than are nesting turtles, the evidence they leave behind on the beach is less conspicuous. Evidence of disrupted sea-finding in hatchlings (hatchling disorientation) can vastly under represent the extent of a lighting problem; however, this evidence can be useful in locating specific problems between lighting inspections. There are two ways one can use hatchling-orientation evidence to help assess lighting problems:

HATCHLING-ORIENTATION SURVEYS

Of the two methods, hatchling-orientation surveys, which involve measuring the orientation of hatchling tracks at a sample of sites where hatchlings have emerged, provide the most accurate assessment. Because the jumble of hatchling tracks at most emergence sites is often too confused to allow individual tracks to be measured, simple measures of angular range (the width that the tracks disperse) and modal direction (the direction that most hatchlings seem to have gone) are substituted. If the sampling of hatchling emergence sites does not favor a specific stretch of beach or a particular time of the lunar cycle, data from these samples can be an accurate index of how well hatchlings are oriented (Witherington et al., 1996).

HATCHLING-DISORIENTATION REPORTS

Although many cases of hatchling disorientation go unnoticed, some are observed and reported. The evidence of such events includes numerous circling tracks, tracks that are directed away from the ocean, or the carcasses of hatchlings that have succumbed to dehydration and exhaustion. Because reporters often discover this evidence while conducting other activities, such as nesting surveys, the events reported often include only the most conspicuous cases. Although these reports have a distinct coverage bias, they can still yield valuable information.

Hatchling-disorientation reports can help researchers immediately identify light-pollution problems. Although not every hatchling that is misled by lighting may be observed and reported, each report constitutes a documented event. When reports are received by management agencies or conservation groups, action can be taken to correct the light-pollution problem at the specific site recorded in the report. To facilitate the gathering of this information, standardized report forms should be distributed to workers on the beach who may discover evidence of hatchling disorientation. The following is a list of information that should be included on a standardized hatchling-disorientation report form:

1. Date and time (night or morning) that evidence was discovered.
2. Observer's name, address, telephone number, and affiliation (if any). The reporter may need to be contacted so that information about the event can be verified and the site can be located.
3. Location of the event and the possible light sources responsible. Written directions to the locations should be detailed enough to guide a person unfamiliar with the site. The reporter should judge which lighting may have caused the sea-finding disruption, a decision that may involve knowledge about lighting that was on during the previous night and the direction(s) of the tracks on the beach. If possible, the type of lighting responsible should be identified (e.g. a high pressure sodium street light).
4. The number of hatchlings of each species involved in the event. Unless carcasses or live hatchlings are found, the species and numbers involved will be an estimate.
5. Additional notes about the event.

Excerpted from: Witherington, B.E., and R.E. Martin. 2003. Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches. 3rd ed. Rev. Florida Fish and Wildlife Research Institute. St Petersburg, FL.

http://research.myfwc.com/engine/download_redirection_process.asp?file=tr-2_3101.pdf&objid=2156&dltype=article

APPENDIX G
PUBLIC INVOLVEMENT

Notice of Availability

The following Notice of Availability was published in the Northwest Florida Daily News on August 16, 2011. No public comments were received.

Public Notification

In compliance with the National Environmental Policy Act, Eglin Air Force Base announces the availability of the *Santa Rosa Island Draft Range Environmental Assessment, Revision 1, at Eglin Air Force Base, FL*, and Draft Finding of No Significant Impact for public review.

The Proposed Action is for the 46th Test Wing Commander to establish a new authorized level of activity for Santa Rosa Island on Eglin AFB that is based on an anticipated maximum usage, with known or minimal environmental impacts. The Preferred Alternative, Alternative 2, would authorize the current level of activity on Santa Rosa Island plus a 300-percent increase in operations over the current level of activity plus foreseeable future activities, including management activities.

Your comments on this Draft Range Environmental Assessment (REA) are requested. Letters and other written or oral comments may be published in the Final REA. As required by law, comments will be addressed in the Final REA and made available to the public. Any personal information provided, including private addresses, will be used to identify your desire to make a statement during the public comment period and/or to compile a mailing list to fulfill requests for copies of the Final REA or associated documents. However, only the names and respective comments of respondent individuals will be disclosed personal home addresses and phone numbers will not be published in the Final REA.

The Draft Range Environmental Assessment is available on the web at www.eglin.af.mil/environmentalassessments.asp from August 16th until August 30th, 2010. Comments must be received by Sept. 2nd, 2010. Each of the libraries in Okaloosa, Santa Rosa and Walton Counties have computers available to the general public and librarians who can provide assistance linking to the document. Hard copies of the document may be available for a limited time by contacting: Mike Spaits, 96th Air Base Wing Environmental Public Affairs, 501 De Leon Street, Suite 101, Eglin AFB, Florida 32542-5133 or email: spaitsm@eglin.af.mil Tel: (850) 882-2836; Fax: (850) 882-3761.

For more information or to comment on these proposed actions, contact: Mike Spaits, Environmental Public Affairs, at one of the contacts above.

2024656

Agency Comments



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

August 30, 2011

Ms. Amy L. Sands, Project Manager
Science Applications International Corp.
1140 North Eglin Parkway
Shalimar, FL 32579

RE: Department of the Air Force - Revised Draft Range Environmental
Assessment, Santa Rosa Island Mission Activities, Eglin Air Force Base -
Okaloosa and Santa Rosa Counties, Florida.
SAI # FL201107135861C (Reference Previous SAI # FL201008095402C)

Dear Ms. Sands:

The Florida State Clearinghouse has coordinated a review of the revised Draft Range Environmental Assessment (EA) under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Northwest Florida Water Management District notes that several changes were made to the document. The comments previously provided by NFWFMD are still appropriate and are reiterated and expanded upon as follows:

- There is inconsistency and lack of detail regarding impacts to wetlands. Table 2-3, 'Summary of Potential Impacts Under All Alternatives' states under all three alternatives, "Mission activities would not adversely impact...wetlands..." Under Section 4.3 Water Resources, however, all three alternatives state:

"...the distribution of wetland areas at some sites may make complete avoidance difficult for vehicle traffic," and again in each alternative, two paragraphs further, "Wetlands at the A-13B crossover point approved in the 2005 PEA would be potentially impacted by AAVs (tracked vehicles), even though avoidance measures would be taken."

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www.dep.state.fl.us

Ms. Amy L. Sands
August 30, 2011
Page 2 of 2

In order to avoid potentially misleading assertions, NFWFMD recommends that Table 2-3 instead express that Mission Activities could potentially impact wetlands; however, impacts will be avoided, disturbance will be minimized and wetland protection measures will be strictly adhered to. This clarification is especially necessary given the increased activities proposed under both Alternatives 1 and 2.

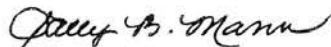
- Also, as previously submitted in comments from NFWFMD, staff remains concerned about water quality measures and highly recommends greater consideration of – and avoidance of – possible contamination associated with onsite activities, particularly given potential for legacy contamination coupled with the increased activities proposed under both Alternatives 1 and 2.

For further information and assistance, please contact Ms. Kim Branciforte at (850) 539-5999.

Based on the information contained in the revised Draft Range EA and the enclosed state agency comments, the state has determined that, at this stage, the proposed activities are consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the concerns identified by our reviewing agencies must be addressed prior to project implementation. The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and subsequent reviews. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process, if applicable.

Thank you for the opportunity to review the revised Draft Range EA. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,



Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

cc: Duncan Cairns, NFWFMD



Project Information	
Project:	FL201107135861C
Comments Due:	08/18/2011
Letter Due:	09/04/2011
Description:	DEPARTMENT OF THE AIR FORCE - REVISED DRAFT RANGE ENVIRONMENTAL ASSESSMENT, SANTA ROSA ISLAND MISSION ACTIVITIES, EGLIN AIR FORCE BASE - OKALOOSA AND SANTA ROSA COUNTIES, FLORIDA
Keywords:	USAF - REVISED SANTA ROSA ISLAND MISSION, EGLIN AFB - OKALOOSA/SANTA ROSA
CFDA # :	12.200
Agency Comments:	
WEST FLORIDA RPC - WEST FLORIDA REGIONAL PLANNING COUNCIL	
No Comments - Generally Consistent with the Strategic Regional Policy Plan.	
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION	
NO COMMENT BY BRAD GRUVER ON 7/20/2011.	
STATE - FLORIDA DEPARTMENT OF STATE	
No Comment/Consistent	
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION	
No Comments	
NORTHWEST FLORIDA WMD - NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT	
The NWPWMD notes that several changes were made to the document. The comments previously provided by NWPWMD are still appropriate and are reiterated and expanded upon as follows: There is inconsistency and lack of detail regarding impacts to wetlands. Table 2-3, 'Summary of Potential Impacts Under All Alternatives' states under all three alternatives, "Mission activities would not adversely impact...wetlands..." Under Section 4.3 Water Resources, however, all three alternatives state: "...the distribution of wetland areas at some sites may make complete avoidance difficult for vehicle traffic," and again in each alternative, two paragraphs further, "Wetlands at the A-13B crossover point approved in the 2005 PEA would be potentially impacted by AAVs (tracked vehicles), even though avoidance measures would be taken." In order to avoid potentially misleading assertions, NWPWMD staff recommends that Table 2-3 instead express that Mission Activities could potentially impact wetlands; however, impacts will be avoided, disturbance will be minimized and wetland protection measures will be strictly adhered to. This clarification is especially necessary given the increased activities proposed under both Alternatives 1 and 2. Also, as previously submitted in comments from NWPWMD, staff remains concerned about water quality measures and highly recommends greater consideration of - and avoidance of - possible contamination associated with onsite activities, particularly given potential for legacy contamination coupled with the increased activities proposed under both Alternatives 1 and 2.	

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
 TALLAHASSEE, FLORIDA 32399-3000
 TELEPHONE: (850) 245-2161
 FAX: (850) 245-2190

Visit the [Clearinghouse Home Page](#) to query other projects.

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Memorandum

Date: August 3, 2011
 To: Duncan Cairns, Chief, Bureau of Environmental & Resource Planning
 From: Kim Branciforte, Assistant Environmental Scientist
 Regarding: Eglin Air Force Base, Santa Rosa Island, Draft Environmental Assessment
 SAI #: FL201107135861C

While the Eglin Air Force Base, Santa Rosa Island, Draft Environmental Assessment was originally reviewed and commented on by NFWFMD just under one year ago (SAI #: FL201008095402C), several changes were made to the document. The comments previously provided by NFWFMD are still appropriate and will be reiterated and expanded upon here.

There is inconsistency and lack of detail regarding impacts to wetlands. Table 2-3, 'Summary of Potential Impacts Under All Alternatives' states under all three alternatives, "*Mission activities would not adversely impact... wetlands...*" However, under the 'Environmental Consequences – Water Resources' section, all three alternatives state:

"...the distribution of wetland areas at some sites may make complete avoidance difficult for vehicle traffic," and again in each alternative, two paragraphs further, "*Wetlands at the A-13B crossover point approved in the 2005 PEA would be potentially impacted by AAVs (tracked vehicles), even though avoidance measures would be taken.*"

In order to avoid potentially misleading assertions, NFWFMD staff recommends that Table 2-3 instead express that Mission Activities could potentially impact wetlands; however, impacts will be avoided, disturbance will be minimized and wetland protection measures will be strictly adhered to. This clarification is especially necessary given the increased activities proposed under both Alternatives 1 and 2.

Also, as previously submitted in comments from NFWFMD, we remain concerned about water quality measures. NFWFMD staff highly recommends greater consideration of – and avoidance of – possible contamination associated with onsite activities, particularly given potential for legacy contamination coupled with the increased activities proposed under both Alternatives 1 and 2.

COUNTY: ALL
 SCH-100-USAf-EG
 2011-3369

DATE: 7/6/2011
 COMMENTS DUE DATE: 8/18/2011
 CLEARANCE DUE DATE: 9/4/2011
 SAI#: FL201107135861C
 REFER TO: FL201008095402C

MESSAGE:
 SEE FILE SAI # FL201008095402C

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
ENVIRONMENTAL PROTECTION FISH and WILDLIFE COMMISSION X STATE	NORTHWEST FLORIDA WMD		

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 HISTORIC PRESERVATION
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The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

DEPARTMENT OF THE AIR FORCE - REVISED DRAFT RANGE ENVIRONMENTAL ASSESSMENT, SANTA ROSA ISLAND MISSION ACTIVITIES, EGLIN AIR FORCE BASE - OKALOOSA AND SANTA ROSA COUNTIES, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
 3900 COMMONWEALTH BOULEVARD MS-47
 TALLAHASSEE, FLORIDA 32399-3000
 TELEPHONE: (850) 245-2161
 FAX: (850) 245-2190

EO. 12372/NEPA Federal Consistency

- | | |
|--|---|
| <input checked="" type="checkbox"/> No Comment | <input checked="" type="checkbox"/> No Comment/Consistent |
| <input type="checkbox"/> Comment Attached | <input type="checkbox"/> Consistent/Comments Attached |
| <input type="checkbox"/> Not Applicable | <input type="checkbox"/> Inconsistent/Comments Attached |
| | <input type="checkbox"/> Not Applicable |

From: Division of Historical Resources
 Division/Bureau: Bureau of Historic Preservation

Reviewer: S. Edwards

Laura D. Kammere
 Deputy SHTPO
 8.29.2011

Date: 8-26-2011

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 AUG 30 2011
 DEP Office of Intergovt'l Programs

Air Force Responses to Comments on the Draft REA

Reviewer	Comment	Response
<p>Florida Department of Environmental Protection, Northwest Florida Water Management District</p>	<p>There is inconsistency and lack of detail regarding impacts to wetlands. Table 2-3, “Summary of Potential Impacts Under All Alternatives” states under all three alternatives, “Mission activities would not adversely impact...wetlands...” Under Section 4.3 Water Resources, however, all three alternatives state: “...the distribution of wetland areas at some sites may make complete avoidance difficult for vehicle traffic,” and again in each alternative, two paragraphs further, “Wetlands at the A-13B crossover point approved in the 2005 PEA would be potentially impacted by AAVs (tracked vehicles), even though avoidance measures would be taken.” In order to avoid potentially misleading assertions, NFWFMD recommends that Table 2-3 instead express that Mission Activities could potentially impact wetlands; however, impacts will be avoided, disturbance will be minimized and wetland protection measures will be strictly adhered to. This clarification is especially necessary given the increased activities proposed under both Alternatives 1 and 2.</p>	<p>Thank you for your comment. Text has been revised to clarify that 1) no vehicles will operate in wetlands under any of the alternatives, and 2) only occasional movement of small numbers of troops on foot could occur in wetlands, resulting in no significant impacts.</p>
<p>Florida Department of Environmental Protection, Northwest Florida Water Management District</p>	<p>Also, as previously submitted in comments from NFWFMD, staff remains concerned about water quality measures and highly recommends greater consideration of – and avoidance of – possible contamination associated with onsite activities, particularly given potential for legacy contamination coupled with the increased activities proposed under both Alternatives 1 and 2.</p>	<p>Thank you for your comment. Discussion of ERP sites has been added to chapter 4. Text has been added to state that 1) the Eglin Environmental Restoration Section would be consulted regarding activities near these sites, 2) most missions would result in minimal ground disturbance, 3) Land Use Controls will be enforced, and 4) personnel should report any discolored soils or chemical odors encountered during missions.</p>

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