RCS 97-046, 99-424

EGLIN AIR FORCE BASE
Florida

SANTA ROSA ISLAND MISSION UTILIZATION PLAN

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

March 2005

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Submitted to:

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

RCS 97-046, 99-424

March 2005

PRINTED ON RECYCLED PAPER

Deliverable 7
Subtasks 1-4

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

µg/L	Micrograms per Liter
µPa	Micropascals
A/C	Aircraft
AAC	Air Armament Center
96 CEG/CEVCE	Environmental Engineering Section, Environmental Compliance Branch of Environmental Management Division
96 CEG/CEVH	Cultural Resources Branch of Environmental Management Division
96 CEG/CEVSN	Natural Resources Section, Stewardship Branch of Environmental Management Division
AAV	Amphibious Assault Vehicle
AFB	Air Force Base
AFF	Air Force Form
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AGL	Above Ground Level
AIM	Air Intercept Missile
AL/OBEN	Acoustic Effects Branch (Air Force)
Al_2O_3	Aluminum Oxide
ALRT	Airborne Littoral Reconnaissance Technologies
AMRAAM	Advanced Medium Range Air-to-Air Missile
AOC	Area of Concern
ARG/MEU	Amphibious Ready Group/Marine Expeditionary Unit
ASEL	A-Weighted Sound Exposure Level
ASTs	Aboveground Storage Tanks
ATV	All Terrain Vehicle
BAM	Bird Avoidance Model
BASH	Bird Aircraft Strike Hazard
BMP	Best Management Practices
BP	Beach – Public Access
BRAC	Base Realignment and Closure
C	Centigrade
C-4	Plastic Explosive
C4ISR	Command, Control, Communications, Computers, Intelligence and Surveillance/Reconnaissance Systems
CA	Controlled Access
CAA	Clean Air Act
CAR	Contamination Assessment Report
CATEX	Categorical Exclusion
CEC	Cation Exchange Capacity
CEQ	Council on Environmental Quality
CFA	Controlled Firing Areas
CFR	Code of Federal Regulations
CHABA	Committee on Hearing, Bioacoustics, and Biomechanics
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CoC	Community of Comparison
COPC	Chemicals of Potential Concern
CY	Calendar Year
CZMA	Coastal Zone Management Act
dB	Decibels
dBA	A-Weighted Decibels
dBC	C-Weighted Decibels
dBP	Unweighted Peak Sound Pressure Level
DET	Distributed Explosive Technology
DoD	Department of Defense
DOPAA	Description of Proposed Action and Alternatives
DPI	Direct Physical Impacts
DU	Depleted Uranium

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

EA	Environmental Assessment
ECM	Electronic Countermeasures
EFDL	Energy Flux Density Level
EFH	Essential Fish Habitat
EGTTR	Eglin Gulf Test and Training Range
ELTTR	Eglin Land Test and Training Range
EIAP	Environmental Impact Analysis Process
EJ	Environmental Justice
ELTTR	Eglin Land Test and Training Range
EMR	Electromagnetic Radiation
EO	Executive Order
EOD	Explosive Ordnance Disposal
ERP	Environmental Resource Permit
ESA	Endangered Species Act
ESTCP	Environmental Security Technology Certification Program
F	Fahrenheit
FA	Floridan Aquifer
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FAMU	Florida A & M University
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FEIS	Final Environmental Impact Statement
FNAI	Florida Natural Areas Inventory
ft	Feet
FTA	Fire Training Area
FWC	Florida Fish and Wildlife Conservation Commission
FY	Fiscal Year
GIS	Geographic Information System
GPB	General Purpose Bomb
GPU	Gun Pod Unit
GSMFC	Gulf States Marine Fisheries Commission
GWEF	Guided Weapons Evaluation Facility
H_2	Hydrogen
HCl	Hydrogen Chloride
HD	High Density
HE	High Explosive
HLZs	Helicopter Landing Zones
HMMWV	High Mobility Multi-Purpose Wheeled Vehicle
Hwy	Highway
ICM	Interim Corrective Measures
INBS	Index Nesting Beach Survey
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
IS	Intermediate System
JBPDS	Joint Biological Point Detection System
JCP	Joint Coastal Permit
JLOTS	Joint Logistics Over the Shore
kg	Kilograms
kg/d	Kilograms Per Day
km^2	Square Kilometer
LAMBS	Littoral Assessment of Mine Burial Signatures
lb	Pound
LCAC	Landing Craft Air Cushion
LCU	Landing Craft Utility
L_{dn}	Day-Night Average Sound Levels
$L_{eq(24)}$	24-Hour Equivalent Sound Level

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

LFTA	Live Fire Training Areas
m^3	Cubic Meters
MCL	Maximum Contaminant Level
MCM	Mine Countermeasures
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
MHW	Mean High Water
MI	Marina/Industrial
mi^2	Square Miles
mm	Millimeter
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MPA	Marine Protected Area
MRTFB	Major Range Test Facility Base
msec	Millisecond
N_2	Nitrogen
NAAQS	National Ambient Air Quality Standard
NAGPRA	Native American Graves Protection and Repatriation Act
NCSC	Naval Coastal System Center
NEOD	Navy Explosive Ordnance Disposal
NEPA	National Environmental Policy Act
NEW	Net Explosive Weight
NFA	No Further Action
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOTAMs	Notices to Airmen
NOTMARs	Notices to Mariners
NTU	Nephelometric Turbidity Units
NW	Northwest
NWI	National Wetlands Inventory
OA HITL	Open Air Hardware in the Loop
OCWS	Okaloosa County Water & Sewer System
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OVA	Organic Volatile Analyzer
PBXN	Plastic Bonded Explosive (Navy)
PEA	Programmatic Environmental Assessment
PETN	Pentaerythritol Tetranitrate
PGU	Precision Guided Unit
pH	Potential of Hydrogen (a measure of acidity)
POI	Points of Interest
PRIMES	Preflight Integration of Munitions and Electronic Systems
psi	Pounds per Square Inch
psi-msec	Pounds per Square Inch per Millisecond
PTS	Permanent Threshold Shift
PZ	Primary Extraction Zone
RDX	Hexahydro-1,3,5-Trinitro-1,3,5-Triazine
re	Referenced
RFA	Recommended Further Action
RL	Residential – Low Density
ROI	Region of Influence
RPV(s)	Remotely Piloted Vehicle(s)
RW	Radioactive Waste
S/A	Surface-to-Air
SA	Surficial Aquifer
SABRE	Shallow Water Assault Breaching

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

SACON	Shock-Absorbing Concrete
SAIC	Science Applications International Corporation
SEL	Sound Exposure Level
SESOIL	Seasonal Soil Compartment Model
SFS	SubFloridan System
SHPO	State Historic Preservation Office(r)
SI	Site Investigation
SIP	State Implementation Plan
SPL	Sound Pressure levels
SRI	Santa Rosa Island
SZTA	Surf Zone Test Areas
TA	Test Area
TCLP	Toxicity Characteristic Leaching Procedure
TDC	Tourism Development Council
THI	Temperature-Humidity Index
TiO_2	Titanium Dioxide
TMD	Theater Missile Defense
TNT	2,4,6-Trinitrotoluene
TP	Target Practice
TS	Test Site
TTS	Temporary Threshold Shift
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WIS	Wave Information Study
ZOI	Zone of Influence

1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The Eglin Military Complex is a Department of Defense (DoD) Major Range Test Facility Base (MRTFB) that exists to support the DoD mission (Figure 1-1). Its primary function is to support research, development, test, and evaluation of conventional weapons and electronic systems. Its secondary function is to support training of operational units. The range is composed of three components.

1. The Eglin Land Test and Training Range (ELTTR), shown in Figures 1-1 and 1-2
   a. Test Areas/Sites
   b. Interstitial Areas (areas beyond and between the test areas)
2. The Eglin Gulf Test and Training Range (EGTTR), shown in Figure 1-1
3. Airspace (over land and water)

The U.S. Air Force Air Armament Center (AAC) has responsibility for the Eglin Military Complex and for 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 with support from the 96th Air Base Wing. The 46th Test Wing Commander is responsible for day-to-day scheduling, executing, and maintaining of this national asset. The continued DoD utilization of the Eglin Military Complex requires flexible and unencumbered access to land ranges and airspace, which support all of Eglin's operations. Eglin controls airspace overlying 127,868 square miles (mi^2), of which 2.5 percent (3,226 mi^2) is over land and 97.5 percent (124,642 mi^2) is over water as shown in Figure 1-1.

Through a Programmatic Environmental Assessment (PEA), the 46th Test Wing is analyzing the cumulative environmental impacts of all current and anticipated future operations conducted on Santa Rosa Island (SRI) and a region of influence (ROI) to include the Gulf-side shoreline of the Island to a depth of 30 feet (Figure 1-2). While SRI is the geographic name of the island, within Okaloosa County the developed portion is locally referred to as Okaloosa Island. However, to eliminate confusion, the island will be referred to as SRI. This document addresses only those activities occurring within the referenced ROI, and is meant to tier off of both the Riverine/Estuarine and EGTTR PEAs, and vice versa. As a result, activities and resources in the Sound and bays are addressed in the Riverine/Estuarine PEA, while activities and resources of the Gulf beyond the surf zone are addressed in the EGTTR PEA. The environmental analysis of SRI mission activities is part of the development of a range *Living Environmental Baseline* to support the diverse array of warfighters that use the Eglin Military Complex for research, development, testing, evaluation, and training. All mission operations and physical and biological resources associated with the ROI will be detailed within this PEA.

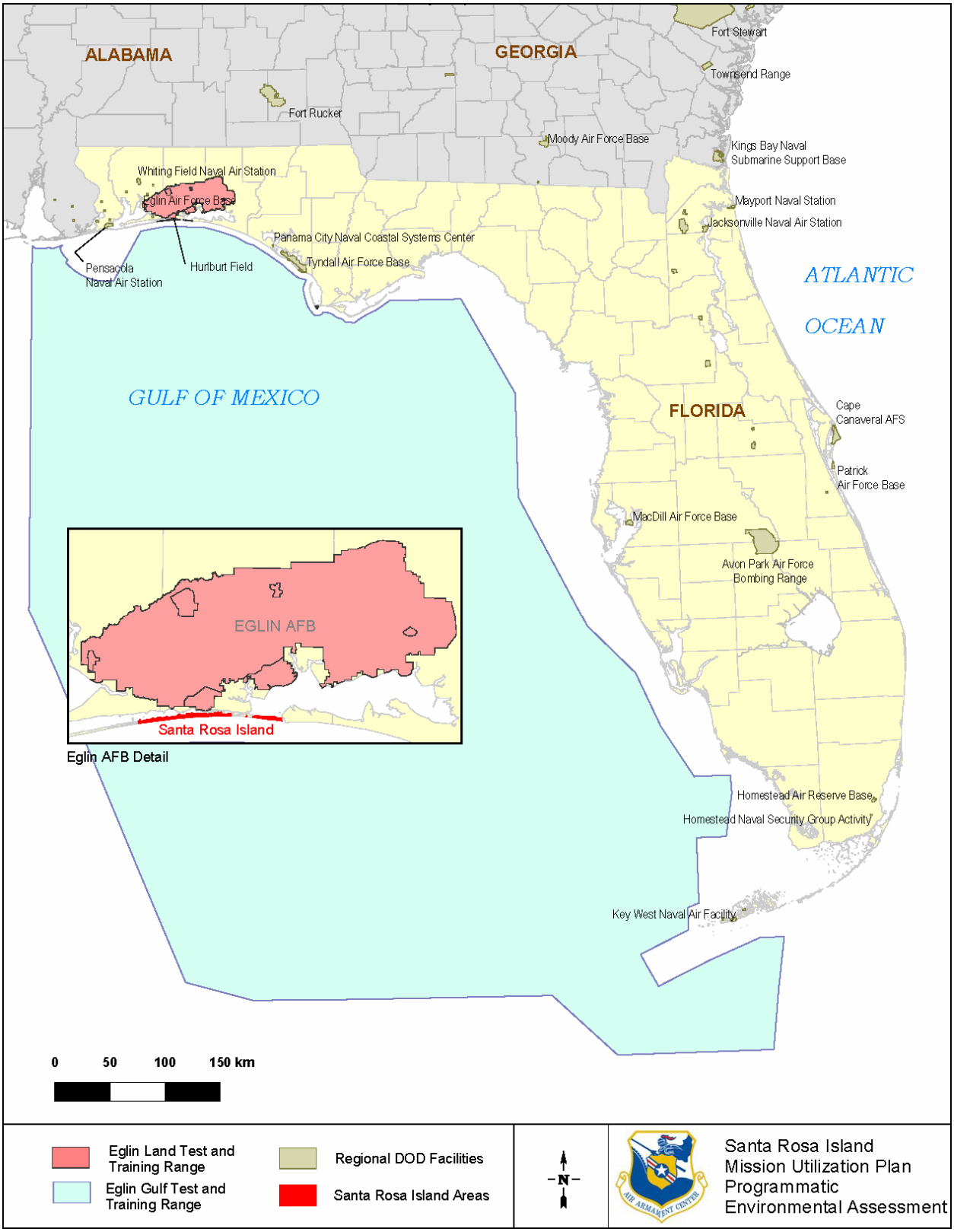

Figure 1-1. The Eglin Military Complex

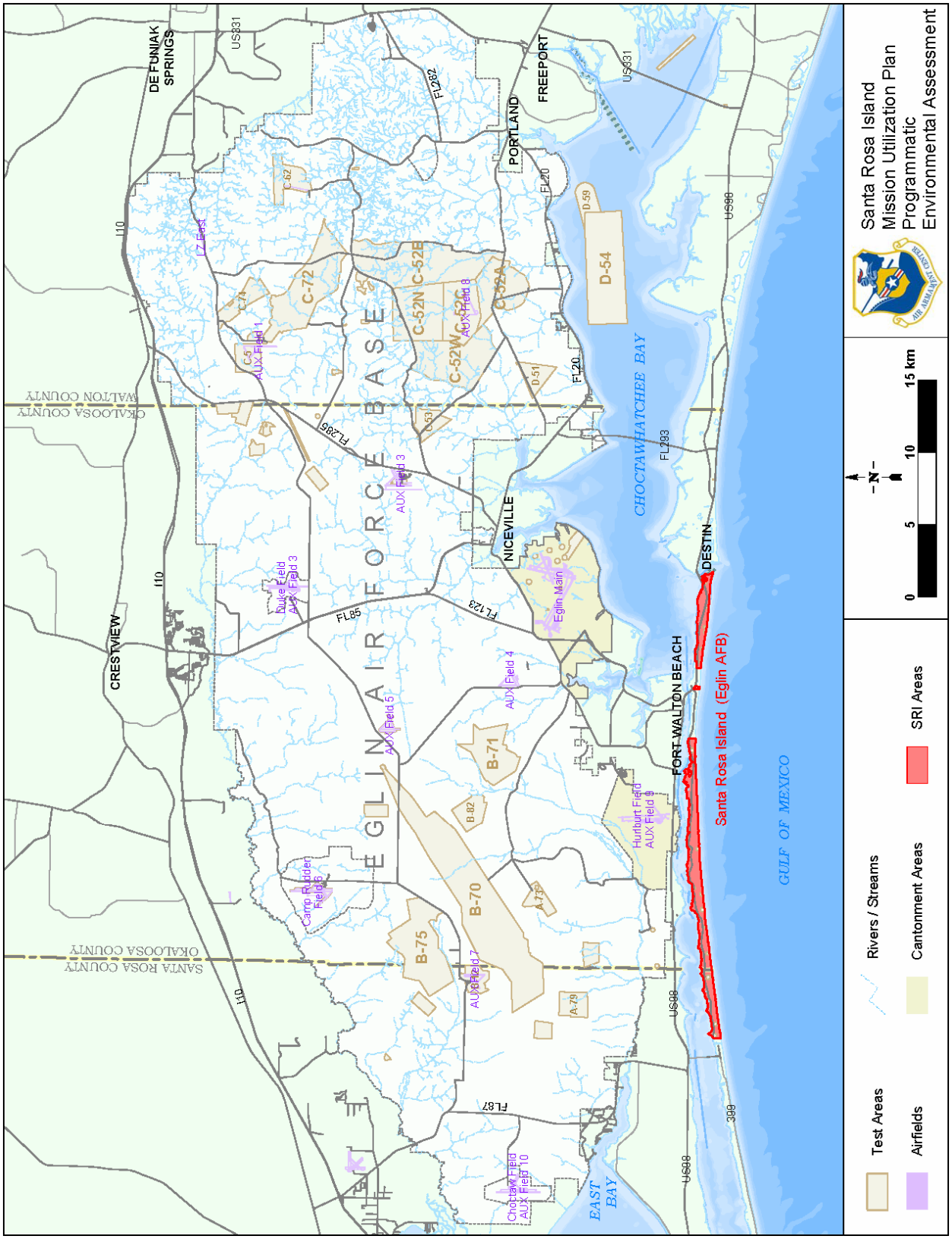

Figure 1-2. Eglin Land Test Areas and Santa Rosa Island

1.2 PROPOSED ACTION

The Proposed Action is for the 46th Test Wing Commander to establish a dedicated mission utilization plan for SRI based on historical and anticipated future usage, with minimal environmental impacts. The purpose and need for this proposed action is two-fold.

First, the Proposed Action seeks to preserve the integrity of the Island as a dedicated DoD asset. SRI is unique in its capacity to support a wide variety of test and training activities due to its proximity to the EGTTR, which provides an exceptionally large area to test weapons with safety footprints that cannot be accommodated on the ELTTR. SRI also provides a land-water interface for real-world wartime training for U.S. fighting forces. However, SRI is also considered by many to be a "community" asset, in that local citizens and tourists utilize its beaches for a variety of recreational purposes. This creates problems of encroachment through public disregard of U.S. Air Force access controls and, on occasion, vandalism and disruption of mission activity. The impact of encroachment on military land use has recently become a "hot topic" issue for discussion.

The need to establish the Island as a dedicated DoD asset is reflected in the need to provide a unique environment for military users in which to conduct real-world special test and training operations that could not be supported on the mainland ranges of the ELTTR and other land ranges in the United States. By establishing a dedicated mission use plan that accommodates coordinated land, air, and sea operations on SRI, Eglin can minimize the potential for encroachment impacts on Santa Rosa Island and effectively maintain a unique, diverse military test and training environment. Additionally, establishing a mission use plan for the Island will provide the ability to quickly and efficiently process new programs requesting access to Santa Rosa Island during routine and crisis situations. This will enable planners to provide military users a quick response to priority needs during war or other significant military involvement as well as improve the current approval process for routine uses.

The second purpose of the Proposed Action is to update Eglin's NEPA analyses by reevaluating the current use of SRI and by performing a cumulative environmental analysis of all current and proposed (those identified to date) SRI uses. Such uses include mission activities and new infrastructure construction or current infrastructure maintenance/upgrades. The need associated with this purpose is multifaceted and described below.

Eglin has performed environmental analyses on its activities on SRI on a case-by-case (i.e., each individual action) basis since NEPA was enacted in 1970. Many of Eglin's activities on SRI have not ceased since the original environmental analyses were done to initiate the action; thus no new environmental reviews have been required or performed. Currently, when approval for a new action is requested, it may be categorically excluded from additional environmental analysis if it is similar in action to an activity 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 [CEQ] and AFI 32-7061 [U.S. Air Force, 1995]).

Since some of these ongoing activities were originally assessed, and also since similar activities were assessed and CATEXed, changes have occurred at Eglin that could affect environmental analysis. These changes, outlined below, create a need to reevaluate the activities individually and cumulatively.

- Additional species have been given federal and state protection status.
- Species have been discovered that were not previously known to exist at Eglin.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin's borders has increased.
- Air Force regulations have changed.
- Military missions and weapons systems have evolved.
- New federal and state environmental regulations have been promulgated, resulting in the need to reevaluate the current activities both individually and cumulatively.

Additionally, with work performed during the 1990s by Eglin in conjunction with The Nature Conservancy, the Eglin ecosystems are better understood now than ever before.

Finally, while each mission has been analyzed individually, a cumulative analysis of potential environmental impacts from all mission activities on SRI has not been performed. The programmatic analysis to be performed in follow-on NEPA documentation will allow for a cumulative look at the impact on Eglin receptors from all mission activities. By implementing an authorized mission utilization plan on SRI, sustainable range management will be streamlined, and cumulative environmental impacts will be more fully understood.

1.3 SCOPE OF THE PROPOSED ACTION

This document addresses only those activities occurring within the referenced ROI, and is meant to tier off of both the Riverine/Estuarine and EGTTR PEAs, and vice versa. As a result, activities and resources in the Sound and bays are addressed in the Riverine/Estuarine PEA, while activities and resources of the Gulf beyond the surf zone are addressed in the EGTTR PEA. Santa Rosa Island (SRI) is a narrow barrier island approximately 50 miles long and less than 0.5 mile 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 Santa Rosa Island: 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 the Island. Each of the three sections of Island has unique characteristics (developed versus undeveloped land) and 15 Eglin AFB test sites are located on Santa Rosa Island (U.S. Air Force, 1997).

In addition to the SRI land mass, this document also addresses the SRI surf zone. The surf zone area is a shallow area covering the continental shelf seaward of the Island to a depth of approximately 30 feet. The distance from the Island shoreline that corresponds to this depth varies from approximately 0.5 mile 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 approximately NW at depths of about 18.3 meters (60 feet) and deeper. The DeSoto Canyon, at the edge of the shelf, is approximately 100 kilometers south of SRI (U.S. Air Force, 1997). The SRI land mass and its associated surf zone are collectively referred to as the SRI Region of Influence (ROI). The air operations that occur in the airspace overlying the Island ROI 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, 1998).

Current land use within the SRI ROI consists of military mission activities, natural and cultural resource management, and public use. Military mission activity occurs across the length of Eglin-owned property, while public use 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. Historical land use activities are categorized below, and locations typically used for these activities (as evidenced by past usage) are reflected in Figure 1-3.

1.3.1 Current Land Use

Military Activities

Testing

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. The major testing categories that have occurred within the SRI ROI are described below.

1. Air Operations Testing

Air operations are analyzed cumulatively in the *Overland Air Operations Programmatic Environmental Assessment* (PEA). On occasion, Remotely Piloted Vehicles (RPVs) are tested at several locations on the Island. However, these activities are relatively benign with regard to SRI, and Air Operations testing will not be evaluated as part of this process.

2. 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 (A/C) against A/C or A/C 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). Island facilities are usually involved in most of these activities. These activities are relatively benign with regard to SRI, and potential impact from this type of testing is associated with electromagnetic radiation from radar and microwave use.

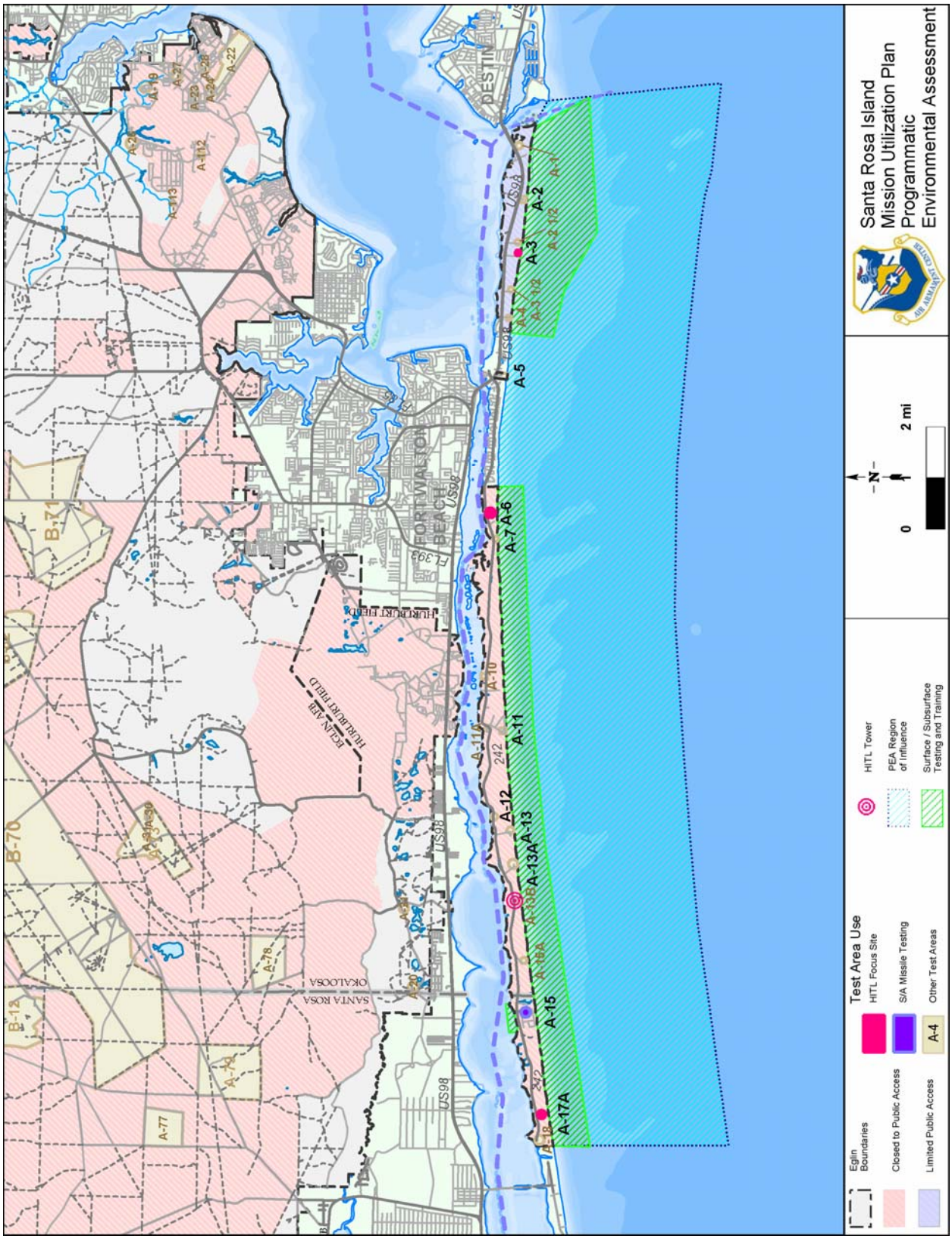

Figure 1-3. Historical Mission and Land Use Areas Within the SRI ROI

3. 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), A-15 (Santa Rosa Island), and surface vessels at target A/C in the 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. These activities have been evaluated through the NEPA process in the *Environmental Assessment for Projected Patriot Testing (Five-year Plan)* (U.S. Air Force, 2002).

4. OA-HITL Testing

The cornerstone of the OA-HITL testing effort is a 300-foot OA-HITL tower at Test Site (TS) A-13B and three focus test sites located at TS A-3, TS A-6, and TS A-17A. The tower has a Skypod and Shaker Table to support test/test support equipment. The focus sites will 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 A/C release through end-game. These facilities will allow OA-HITL testing in lieu of flight testing and are projected to save $10 million on the Advanced Medium Range Air-to-Air Missile (AMRAAM) and new Air Intercept Missile (AIM-9X) programs alone. The tower will also be 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, 1998a).

5. Surf Zone Testing/Training

These activities take place within the surf zone, as shown in Figure 1-3. The proposed locations for these activities are evaluated on an as-needed basis through the Air Force Form (AFF) 813 process. Historical activities under this category are described below.

- <u>Mine Clearance Testing</u>

  Use of a line charge has been conducted in the past as a precursor to other tests to evaluate the effectiveness of underwater mine countermeasure and clearing techniques. The line charge assembly was tested in fiscal year (FY) 98 by the Naval Coastal System Center (NCSC) in a shallow water area adjacent to Santa Rosa Island. The M-58 Line Charge System was mounted on an Amphibious Assault Vehicle (AAV) and deployed to the vicinity of test site A-17. Once in position, the line charge was deployed from the Landing Craft Air Cushion (LCAC) by an MK 22 (Mod 4) Rocket. After the line charge was fully deployed, it was detonated. The line charge contained 1,750 pounds of C-4 explosives and 11 pounds of PETN explosives. These tests were evaluated and approved through the NEPA process in the *Final Environmental Assessment for Coastal Testing of the Shallow Water Assault Breaching (SABRE) and Distributed Explosive Technology (DET) Systems* (U.S. Air Force, 1999) and *Final Environmental Assessment for Testing*

of the MK-82 General Purpose Bombs and MK-5 Mine Clearance System (U.S. Air Force, 1999a) and received a Letter of Authorization for the incidental harassment of marine mammals from surf zone testing missions in 1998 through consultation with the National Marine Fisheries Service (NMFS).

6. 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 test/training activities typically involving live/inert testing of various firing mechanisms in concert with travel through the land-water interface and across beach environments. In 1998, the Navy tested the integration of the LCAC with the GPU-5 (gun pod unit-five) 30 mm weapon system in a feasibility demonstration. This activity was evaluated through the NEPA process in the *Environmental Assessment for the Landing Craft Air Cushion (LCAC)/Gun Pod Unit-5 (GPU-5) Integration Demonstration* (U.S. Air Force, 1998b). A refueling site on Test Area (TA)-13B on Santa Rosa Island was temporarily established to reduce the number of trips to the normal refueling location on TA-22 for more efficient use of resources and time.

The LCAC engaged targets on Santa Rosa Island from a position in Santa Rosa Sound approximately 1,000 feet from the shore, firing south in the direction of the Gulf. Targets were placed approximately 20 feet from the high water line of Santa Rosa Sound and included 3 each of concrete cubes, jersey barriers, steel hedgehogs, steel tetrahedrons, and 60 sea urchins (welded steel rods). Target practice (TP) rounds were fired in burst lengths of less than 100 rounds. A total of 353 30 mm TP (training) rounds were expended from Santa Rosa Sound into the Gulf. After engaging the targets, the LCAC crossed over Santa Rosa Island moving at speeds of less than 5 knots. The crossover occurred in the vicinity of TA A-13B. After maneuvering in the Gulf, the LCAC again crossed Santa Rosa Island into the Sound and returned to TA A-22. Debris was recovered and removed where possible. A helicopter, two watercraft, and four all-terrain vehicles were employed to watch for nonparticipants within the testing area. Notices to airmen and mariners (NOTAMs and NOTMARs) were published or broadcast notifying the activation of the restricted airspace and controlled firing area within which the test was conducted.

In 2000, an LCAC Tank Transport test was conducted near TA-13B on Santa Rosa Island that involved transport of a Hercules Tank Retriever from TA-22 to Santa Rosa Sound and over the Island. Use of the Island for LCAC crossovers at TA 13B associated with amphibious assault exercises was also evaluated in the *Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) Readiness Training Environmental Assessment* (U.S. Air Force, 2003) and *ARG/MEU Biological Assessment* (U.S. Air Force, 2003a) for the USFWS.

7. 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, 2002a), the *Environmental Assessment for Joint Biological Point Detection System (JBPDS) at Multiple Test Ranges*

(U.S. Air Force, 2003b), and the *Biological Assessment for Airborne Littoral Reconnaissance Technologies (ALRT) Project* (U.S. Air Force, 2004a).

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.

1. 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 would require short duration helicopter landings on the Island. Similar activities involving low-flying helicopters and personnel traversing the Gulf in small watercraft were assessed in the *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force, 2003), *ARG/MEU Biological Assessment* (U.S. Air Force, 2003a) for the USFWS and the National Marine Fisheries Service (NMFS), (U.S. Air Force, 2003c), *U.S. Army Ranger Los Banos Training Biological Assessment* (U.S. Air Force, 2003d), and *Advanced Skills Training Program Biological Assessment* (U.S. Air Force, 2003e).

2. 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. The Island 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 and 2003a). Additional activities involving Advanced Skills Training and Ranger Training have also recently undergone ESA Section 7 consultation with the USFWS (U.S. Air Force, 2003d and 2003e). 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) and *ARG/MEU Biological Assessment* (U.S. Air Force, 2003a) for the USFWS.

Natural/Cultural Resource Management

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 the Proposed Action or Alternatives in this document. These activities have been evaluated under separate regulatory and environmental documentation

(i.e., the Eglin AFB *Integrated Natural Resources Management Plan (INRMP)* (U.S. Air Force, 2002), the *INRMP Environmental Assessment* (U.S. Air Force, 2002c), *INRMP Biological Assessment* (U.S. Air Force, 2002d), and the Eglin AFB *Integrated Cultural Resources Management Plan* (U.S. Air Force, 2003f).

Public Use

As described earlier, Eglin AFB controls 4,760 acres of Santa Rosa Island 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 (Figure 1-3). The public accesses the Gulf-side and Sound-side beaches at multiple locations along the limited-access portion of the Island 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 Santa Rosa Island 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 the Island from public access.

The portion of the Island 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 the Island. The public uses these areas for recreational activities, and near-shore areas of the Gulf are used for boating and fishing.

1.3.2 Future Land Use

Military Mission Activity

SRI use is evolving due to changes in threats to national security and the effects of Hurricane Opal. The 1994 Base Realignment and Closure (BRAC) Committee recommendation to consolidate ECM testing at the Western Range Complex, which comprises several bases in the western U.S., directed some of the Island's ECM and instrumentation systems to the Western Range Complex and has placed others in storage. Hurricane Opal, a major (Category III) hurricane that struck the area in October 1995, caused significant damage to many of the Island sites, accelerating the movement of ECM systems to the west. Since the storm, the AAC has developed an "Island Reconstitution Plan" and is aggressively pursuing this plan. The plan retains many of the capabilities developed in the 1970s and 1980s; in addition, it is expanding into the C4ISR systems arena and OA-HITL testing.

In addition to the developments mentioned previously, actions related to the terrorist attacks of 11 September 2001, and the war in Iraq have resulted in an identified need to conduct more frequent and more sophisticated test and training activities in order to increase homeland security and provide U.S. troops with real-life training for combat preparation and certification. Examples

of these activities include the ARG/MEU readiness training activities and the Joint Biological Point Detection System (JBPDS) testing activities scheduled to take place on the Island in the near future.

The Island is a tremendous resource with numerous current and potential future uses. Potential future uses include some that are currently in planning, while others are proposed or being evaluated. These new operational uses of the Island are described below.

Expanded Surf Zone Testing/Training – Established Surf Zone Test Areas

The designation of surf zone test/training areas has been proposed to accommodate expanded activities, as well as those described earlier (i.e., mine clearance testing, etc.). These areas would be established within current usage guidelines similar to the numerous test areas as described in the *AAC Technical Facilities Manual (Volume II Land Test Areas)* (U.S. Air Force, 1996). Such test area guidelines would include a description of operational and environmental constraints. Having these guidelines in-place would tremendously expedite the environmental approval process. Future activities would involve the following.

- SABRE Mine Clearing Testing

  The Navy's Shallow Water Assault Breaching (SABRE) explosive net clearing weapon is in development with testing ongoing at Eglin's Shallow Water Mine Pond Facility. This program also needs a location to demonstrate and evaluate this weapon and determine the effects it may have on the U.S. Navy LCAC. 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 needs to be established, as well as an area where the LCAC can transient over the Island from the Gulf of Mexico to Santa Rosa Sound. Testing of the SABRE system would involve 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 the Island. Recovery operations could also require a brief closing of Hwy 98 (Pipkin, 1996). 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, 1999) and *Biological Assessment for Coastal Testing of the SABRE and DET Systems* (U.S. Air Force, 1998c) 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, 1998d). However, 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. One way these surf zone tests can be

easily facilitated is by establishing an island surf zone test area in lieu of just test sites with defined procedures, HE limits, and mitigations.

Small Boat Obscurant Testing

The Navy has a requirement to develop and test an obscurant system for their small combatant watercraft. The Navy would like to test against certain operational scenarios and have determined they must have a beachfront area to do this test. Only Eglin's island 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.

Proposed sites for obscurant testing on the Island include A11, A13, A13A, and A15. 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 (Edgewood Research, Development and Engineering Center, 1996).

Expanded OA-HITL Tower Testing

Expanded testing with the OA-HITL tower would involve sensor testing with smoke and obscurants. The 300-foot OA-HITL tower would be used for this purpose with the addition of a railroad track and turntable. The use of smoke and obscurants would be evaluated with published restrictions, limitations, and mitigations.

Live Fire

Live fire operations would involve small caliber weapons between 5.56 mm and .50 caliber and would be used and fired in a seaward direction only. If available, soldiers would use frangible munitions with a 200-meter range or those of non-lead composition (i.e. tungsten) to reduce or eliminate potential environmental and safety concerns. Larger caliber weapons such as the 30 mm would potentially be used on an intermittent basis.

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 5 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 the Island. 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 the Island for special operations training exercises. Although this training is currently ongoing, it is fragmented and needs to be established to accommodate the growing need. Similar types of activities have been evaluated in the *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force, 2003).

Amphibious Assaults

Several organizations have a need to initiate or expand their current work in or around the Island. The Marine Corps has a need to use the Island 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 off shore and traverse to the Island. Upon reaching the Island, 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, 2003) discusses these activities.

Expanded LCAC Training/Testing

The need for expanded LCAC training and testing is in line with the need for expanded special operations and amphibious assault training and testing activities. Expanded LCAC activities would involve the increased use of the LCAC for both inert training activities and live fire testing and training, as described previously. The LCAC would utilize specific areas for crossing from the Gulf to Santa Rosa Sound and vice-a-versa and for the use of firing weapon systems. Similar activities have been evaluated and approved at TA 13B under the *ARG/MEU Readiness Training Environmental Assessment* (U.S. Air Force, 2003) and the *Environmental Assessment for the LCAC/GPU-5 Integration Demonstration* (U.S. Air Force, 1998b).

Other Testing/Training

Many other organizations have expressed a need to establish routine training, testing, and evaluating of procedures with on-going exercises. As availability of SRI resources increases, and as SRI expands its capability to support more diverse missions, it is anticipated that organizations throughout the DoD will utilize SRI to support their testing and training needs. Joint Logistics Over the Shore (JLOTS) has exercised at Eglin in the past, pumping millions of gallons of fuel from surface ships through hoses into fuel bladders on the Island and, then to barges in the Sound. JLOTS would like to establish routine training and exercises of these systems and crews.

1.4 ISSUES

Issues within the context of this document are the general categories used to distinguish the potential environmental impacts of actions described in the alternatives on identified resource areas within the SRI ROI, identified through preliminary investigation as the following.

- Threatened, Endangered, and Sensitive Species
- Cultural Resources
- Wetlands
- Sensitive Beach Habitats
- Installation Restoration Program Sites
- Surrounding Communities/Public

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. The issues that were determined to be of potential consequence to the resource areas identified above include noise, habitat alteration, direct physical impact, and restricted access/safety (Section 1.4.2). Those

issues that were eliminated from detailed impact analysis are described below, with narratives providing a summary of preliminary screening for potential impacts.

1.4.1 Issues Eliminated from Detailed Impact Analysis

Debris

Debris includes items from missions such as gunnery, shrapnel, and flare chutes. The type of debris related to current mission activities is essentially litter. Many units operate under a policy of cleaning up after missions, so debris that is left behind is likely done so unintentionally, accidentally, or because the item is simply irretrievable or lost. Non-enforcement of clean-up 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 higher percentage of recreational and public users to the military, 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 should fall within the Launch Hazard Area, which for the PATRIOT is a circle with a radius of 6,000 feet centered on the launch pad. Limited damage to vegetation may be anticipated from falling missile debris fragments. Although extremely remote, the potential does exist for wildlife to experience direct physical impacts as well.

No debris patterns or fragment sizes are known, but for the purposes of analysis, assume that debris consists of individual five-pound fragments. Since the missile launches are independent events, the maximum number of debris fragments, and therefore the greatest potential for a direct physical impact, would result from a Caesar Trumpet launch. For one of these events, the total number of five-pound pieces could be 352 fragments spread out over 4 square miles (Table 1-1), or approximately 88 fragments per square mile (one piece per 563 x 563 foot square area). Using this dispersion factor, a maximum event total of 352 debris fragments equates to about 0.00000316 DPI per square foot area.

Table 1-1. 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. Army, 1990; Dames and Moore, 1992

Direct physical 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.

The 30 mm round, which would be used for LCAC 30 mm testing and training on the Island, is the 30 mm TP, PGU-15/B. The 30mm TP, PGU-15/B cartridge projectile has a steel body with a solid aluminum nose, hollow steel nose cap, or hollow aluminum windscreen (U.S. Air Force, 1996a). The rounds to be used are completely inert, as no chemical explosives (except for the propellant) will be used. The expended cartridges stay on the LCAC.

Management requirements for debris include the mandatory cleanup of debris at test sites, which should be conducted according to regulations on debris and hazardous materials. Debris from air-dropped live ordnance should not occur in the marine portion of the ROI since all live ordnance dropped into the EGTTR will normally be dropped beyond the 100 fathom line (approximately 30 miles from shore). Use of inert or TP rounds of ordnance should always be considered. Sea turtle season (1 May to 31 October) should be avoided.

Electromagnetic Radiation

Current military operations involving electromagnetic radiation (EMR) and lasers are not anticipated to impact on anthropogenic resources due to safety measures employed by the Air Force. Potential EMR impacts were analyzed in the *Electromagnetic Radiation Draft Programmatic Environmental Assessment* (U.S. Air Force, 2002e). Analysis showed that, due to the safety considerations incorporated into the operation of these devices, the potential for impacts to humans are unlikely. Additionally, based on the configurations of the radars, lasers, and microwave devices that are used, impacts to biological resources are anticipated to be low to zero. The devices are either oriented too high to impact land-based biological resources, or do not focus on any one area long enough to cause permanent damage to airborne biological resources such as birds. The likelihood that EMR would impact biological resources is represented by the probabilities displayed in Table 1-2:

Table 1-2. Probability of a Radar Beam Bird Strike Within a Given Hazard Area

Bird Size	Radar System	Hazard Area (feet)	Chance of Beam Contact	Probability of Occurrence
25 grams	AN/FPS-16	1,198	0.0046%	1 in 21,739
3.5 kilograms	AN/FPS-16	946	0.0046%	1 in 21,739

Time averaging is an important aspect in determining whether a bird may be exposed to hazardous levels of EMR. The average maximum time of exposure in relation to hazardous levels of EMR is six minutes. As a result, if a 25-gram bird were to encounter the beam, it would have to either hover within the beam or fly directly along the beam path for a duration of six minutes in order to experience a hazardous exposure to EMR.

More detailed information may be found in the EMR PEA. As a result of previous analysis and the apparent improbability that electromagnetic radiation would negatively impact environmental resources, no further analyses were conducted.

Air Quality

A preliminary analysis of project generated air emissions was conducted to determine if:

- There would be a potential for violation of a National Ambient Air Quality Standard (NAAQS).
- Emissions contributed to an existing or projected air quality violation.
- Sensitive receptors were exposed to substantial pollutant concentrations.
- Any significance criteria established by the Florida State Implementation Plan (SIP) was exceeded.
- A permit to operate was required.
- A change to the Title V permit was required.

Under existing conditions, the ambient air quality in Okaloosa County is classified as attainment for all national ambient air quality standards as defined in the Clean Air Act.

The primary emission sources associated with the actions evaluated are intermittent mission-related effects from fugitive dust (particulate matter) and combustive emissions generated by vehicles and equipment such as aircraft and LCACs and the use of smokes and obscurants during particular training activities. Underwater detonations would have a minimal impact to air quality. Emission effects would be temporary and would fall off rapidly with distance from affected sites. Due to the short-term effect of mission-related fugitive and combustive emissions and the small areas affected, there would be no potential adverse cumulative impacts on air quality associated with construction-related activities associated with the Proposed Action.

In accordance with Section 176(c), USEPA promulgated the General Conformity Rule that is codified as 40 CFR 51, Subpart W. The provisions of this rule apply to state review of all federal general conformity determinations submitted to the state pursuant to 40 CFR 51, Subpart W and incorporated by reference at Rule 62-204.800 Florida Administrative Code. The Conformity Rule only affects federal actions occurring in non-attainment and maintenance areas. Since the Proposed and Alternative Actions are located in an attainment area, the Air Force would not need to prepare a conformity determination for the Proposed or Alternative Actions on Santa Rosa Island.

1.4.2 Issues Identified for Detailed Analysis

Noise

Noise is defined for the SRI ROI as the unwanted sound produced by mission testing or training activities. Noise may directly inconvenience and/or stress humans and some wildlife species and may cause hearing loss or damage. Scientific data correlating the effects of noise on humans is 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 munition detonations, the use of gunnery, LCACs, and from low-level aircraft. The environmental consequences analysis attempts to evaluate the potential impacts of mission noise events on the public and sensitive wildlife species.

Direct Physical Impacts

Direct physical impact is the physical harm that can occur to an organism (plant or animal) or cultural resource as a result of mission or land use activities. Examples include aircraft collisions with birds, vehicle-animal road collisions, crushing an organism by vehicle or foot traffic, and ordnance shrapnel or debris striking an organism. Direct physical impact is also a threat to prehistoric and historic cultural features; significant features, structures, artifacts, and site integrity may be damaged or lost due to physical disruptions. The mission activities of potential consequence to direct physical impacts within the SRI ROI include low-level aircraft use (bird strikes), testing/training involving ordnance, and foot/vehicle traffic.

Habitat Alteration

Habitat alterations can result from physical damage, stress, or disruptions to sensitive barrier island habitat. A habitat in this instance refers to the ecologic and geomorphologic components, such as vegetation, soil, topography, and water that support organisms. 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 direct physical impacts and may result in physical stress, injury, or mortality to the biological components of habitats. The main activity of potential consequence to the habitats of SRI is vehicle/foot traffic.

Restricted Access/Safety

Restricted access is typically the result of safety considerations. Safety involves hazards to military personnel and the public resulting from mission activities. 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. Guidance for restricted access and safety is utilized to coordinate public and military use of airspace, water space (e.g., the Gulf of Mexico), and land areas within the Eglin region of influence (ROI). Mission activities that are of potential consequence to restricted access and safety within the SRI ROI involve the use of low-level aircraft, live munition detonations and firing, use of electromagnetic radiation (EMR) devices (radars), and the need for area closures to nonparticipating personnel due to large-scale training exercises.

1.5 PERMITS, LICENSES, ENTITLEMENTS, AND OTHER REGULATORY REQUIREMENTS AND COORDINATION

Regulatory requirements associated with establishing a mission utilization plan for the SRI ROI may include a Clean Water Act Section 404 permit for actions affecting wetlands, a Works in the Water permit from the Florida Department of Environmental Protection (FDEP) for actions involving release of expendables within 3 miles of the coastline, and a Coastal Zone Management consistency determination. A National Historic Preservation Act Section 106 consultation with the Florida State Historic Preservation Officer to assess potential impacts to cultural resources may also be required. The need for the above actions would be determined through analysis in the PEA process. An Endangered Species Act (ESA) Section 7 Consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) will be required to assess potential impacts to threatened and endangered species and marine mammals. Coordination with Eglin's Environmental Engineering Section (96 CEG/CEVCE) for hazardous materials and AAC Plan 32-7 requirements will be needed.

1.6 ENVIRONMENTAL JUSTICE

On 11 February 1994, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued with the directive that during the National Environmental Policy Act (NEPA) process, federal agencies adopt strategies to address the environmental concerns of minority and low-income communities that may be impacted by the implementation of federal missions. The intent of the Executive Order is to

ensure that no individual or community, regardless of race, ethnicity, or economic status, should shoulder a disproportionate share of adverse environmental impacts to human health or environmental condition resulting from the execution of federal missions. The purpose of environmental justice is to identify disproportionately high and adverse socioeconomic and/or environmental impacts and identify appropriate alternatives.

There are no low-income or minority individuals or communities that are anticipated to bear a disproportionate share of adverse socioeconomic or environmental impacts by the formulation of a mission utilization plan on Santa Rosa Island. The Environmental Justice issues that could potentially be associated with the decision regarding the preferred alternative for the SRI mission utilization plan are public access to the lands associated with the SRI and Native American Programs.

The access of the public to Santa Rosa Island during mission activities is restricted regardless of socioeconomic status for safety and security reasons and does not disproportionately impact individuals or communities of concern. As a result, an additional analysis of environmental justice will not be included in subsequent NEPA documentation.

The Executive Order also requires the application of equal consideration for Native American Programs. This may include the protection of Native American tribal lands and resources such as treaty-protected resources, cultural resources, and/or sacred sites. This issue, along with the associated public participation mechanisms, is fully addressed via Eglin's compliance with the Native American Graves and Repatriation Act of 1990 and the American Indian Religious Freedom Act.

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2. ALTERNATIVES

2.1 INTRODUCTION

This section introduces the alternatives that will be evaluated for potential environmental impacts in the Programmatic Environmental Assessment for the SRI Mission Utilization Plan. Alternatives identify an action or a series of actions that achieve the desired results. For the purposes of this document, the alternatives for the SRI plan are formulated with the following attributes.

- Preserve the integrity of SRI as a dedicated Department of Defense asset.
- Support the current level of mission activities.
- Promote the efficient use of SRI in supporting military mission additions and surge and crisis needs in an environmentally responsible manner.
- Identify Best Management Practices (BMPs) for minimizing the impact potentials of military land use on cultural resource areas and ecosystem quality.

The proposed alternatives, which are analyzed in this document, are:

- No Action Alternative: Continued utilization of the Island involving current mission activities as described in Chapter 1 of this document, evaluating each mission as needed.
- Alternative 1: Establish a DoD Mission Use Plan for SRI based on past and current activities that have already been evaluated to include established restricted access measures and designated areas for current/historical mission activities.
- Alternative 2: Alternative 1 plus the addition of established Surf Zone Test/Training Areas.
- Alternative 3: Alternative 2 plus the addition of established Special Operations/LCAC Live Fire Training Areas. This is Eglin's Preferred Alternative.

A brief description of each alternative is provided below.

2.2 ALTERNATIVES CONSIDERED

2.2.1 No Action Alternative: Continued Utilization as Needed

The No Action Alternative is based on the current and historic types of particular land use activities on Santa Rosa Island, as described in Chapter 1. This alternative is then defined as continuing the current practice of analyzing each SRI action on an individual basis. This process has served Eglin well and has allowed good stewardship of the Eglin resources for many years. ***This alternative does not establish any type of planning efforts for the utilization of Santa Rosa Island***. Therefore, each action and associated location is identified by the proponent and evaluated by a working group. If further environmental analysis is required, an Environmental Assessment is prepared. This is a time and resource intensive process. Crisis or surge activities can be handled reasonably quickly, but at the expense of other programs. Additionally, current

access measures for the limited access portion of SRI would remain. No further measures would be implemented.

2.2.2 Alternative 1: Establish a Mission Use Plan

This alternative is defined as establishing a Mission Use Plan (Figure 2-1) for SRI based on past and current activities that have already been evaluated. These activities were described in Chapter 1. In addition to designated areas for current/historical mission activities, Alternative 1 would include established restricted access measures on the eastern portion of SRI. This Alternative would involve the following restricted access measures.

- Maintain existing fencing along the south side of Hwy 98 bordering Eglin property.
- Maintain public access at Destin Bridge and Beasley Park as it is today.
- Post signs at public access points advising beachgoers of potential restriction of beach access during time of mission activity as a public safety and mission integrity measure.
- Air Force and other authorized personnel will continue to patrol the USAF Island property to maintain mission integrity, protect public safety and Air Force property, and execute the Air Force environmental stewardship mission.

Alternative 1 includes a cumulative evaluation of typical activities that occur on Santa Rosa Island. By authorizing this level of activity, similar mission requests may be quickly and efficiently approved. Table 2-1 lists the types of mission uses the Island currently supports and those that have been identified as future requirements and their respective designated action areas under each of the alternatives.

For designated mission use areas under Alternative 1, operations will include certain operational constraints or management requirements associated with resource areas identified through past analysis, such as conducting tests involving detonations during winter months to avoid sea turtle and shorebird nesting seasons and implementation of protected marine species clearing procedures. These operational constraints and management requirements are based on environmental impact analysis for identified resources within or near the action areas, and are described in Chapter 4 of this document.

Figure 2-1. Alternative 1 Proposed AF Mission Use Areas

Table 2-1. Alternative Mission Activities and Locations

Activity	Ordnance Type		Location*			
	Live	Inert	No Action	Alt. 1	Alt. 2	Alt. 3
Current						
Electronic Systems/ECM Testing/ Training	N/A		Where Approved	TS A-2, TS A-3, TS A-5, TS A-7, TS A-11, TS A-12, TS A-13, TS A-13A		
S/A Missile Testing	Y			TA A-15, TA A-10		
OA-HITL Testing	N/A		HITL Tower (TS A-13B) and Focus Sites (TS A-3, TS A-6, TS A-17A)			
Surf Zone Testing/Training	Y		Where Approved (within surf zone)		TA A-15, TA A-10, ~TA A-2	
Ground Testing	Y		Where Approved	TA A-15		Various Locations Across Island
Personnel/Equipment Drops and Extractions	N/A			Throughout Surf Zone; OPUS & NYE PZs		
LCAC Crossovers	Y			TA A-13B		Various Locations (Figure 2-6)
Ground Training	Y			Various Locations Across Island		
Future						
Expanded Surf Zone Testing/Training Established Test Areas	Y		Where Approved		TA A-15, TA A-10, ~TA A-2	
Small Boat Obscurant Testing	N/A					
Expanded OA-HITL Tower Testing			HITL Tower (TS A-13B) and Focus Sites (TS A-3, TS A-6, TS A-17A)			
Live Fire	Y		Where Approved			Various Locations (Figure 2-6)
Expanded Special Ops Training						Various Locations Across Island
Amphibious Assaults	N	Y				Between A-10 & A-15
Expanded LCAC Training/ Maneuvers						Various Locations (Figure 2-6)

* Where Approved = resulting from AFF 813 process

2.2.3 Alternative 2: Alternative 1 Plus Establishment of Surf Zone Test Areas

Alternative 2 includes the activities proposed in Alternative 1, with the addition of the establishment of Surf Zone Test Areas (SZTAs) on SRI to support major surf zone test exercises. In this alternative, areas on Santa Rosa Island would be utilized to perform these exercises in the Surf Zone. Major surf zone test exercises include neutral (inert) systems and live (containing explosive material) systems, which would be detonated underwater in shallow water. Testing of actual charges on Santa Rosa Island would include 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 is also planned to occur within these areas.

The areas for establishment of SZTAs will be evaluated in the Environmental Assessment based on their accessibility to the surf zone on the south side of the Island, 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.

Figure 2-2 shows the areas that will be evaluated under this alternative, while Figures 2-3 through 2-5 show pictures of a previous surf zone test.

Figure 2-2. Alternative 2 Proposed AF Mission Use Areas

Figure 2-3. Line Charge Fired from Amphibious Assault Vehicle (AAV) in the Gulf of Mexico Towards SRI

Figure 2-4. Line Charge Lands in Surf Zone

Figure 2-5. Line Charge Detonated in Surf Zone

Concentrating surf zone detonation activities within certain zones may reduce the environmental impacts associated with these activities as well as standardize the logistics of surf zone detonations and operational planning. These SZTAs would be established with published usage guidelines similar to the numerous test areas described in the *AAC Technical Facilities Manual, Volume II, Land Test Areas* (U.S. Air Force, 1996). These test area descriptions will include limitations, restrictions, mitigations, facilities, and instrumentation. The operations in these areas include certain operational constraints and management requirements associated with the actions described above based on environmental impact analysis for identified resources. These are described in Chapter 4 of this document. Having these constraints and management requirements in place is anticipated to tremendously expedite the environmental approval process for new programs needing this type of environment in which to test or train.

2.2.4 Alternative 3: Alternative 2 Plus the Addition of Increased Special Operations Training and LCAC Live Fire and Cross-Over Areas

Alternative 3, Eglin's Preferred Alternative, proposes all of the activities described in Alternatives 1 and 2 with increases in Special Operations training within established maneuver areas and the additional establishment of LCAC live fire and crossover areas on the Island. Increased special operations training would involve covert beach landings and assaults and other mission training activities. These exercises could involve full-scale beach assaults involving dozens of troops and landing craft (i.e., LCACs and AAVs), or small-scale exercises involving dropping off personnel in rubber boats within the ROI. Personnel would navigate in, conduct a covert landing on the beach, and capture a target on the Island or proceed to transit the Island and go to the mainland. Live fire capability using low-range, high-fragmentation munitions would be enabled at the maneuver areas to allow for more realistic training scenarios. Figure 2-6 shows the areas that will be evaluated under this alternative.

Figure 2-6. Alternative 3 Proposed AF Mission Use Areas Map View Breakdown

The areas evaluated would serve as LCAC crossing and maneuver areas and AAV maneuver areas and would enable live fire from the Sound into the Gulf. LCAC and AAV maneuvering, traversal, loading/unloading, and parking area/sites are necessary and anticipated for many future Island missions, including launch of live and inert beach obstacle clearing systems, troop support testing, and the development of tactics and crew training. Additionally, future test and training may require LCACs or AAVs to enter the Island from the Gulf or the Santa Rosa Sound side and travel across or stop on the Island. This capability will allow for up/down-load of cargo or fuel or overnight parking. The establishment of LCAC/AAV operating areas, locations to traverse the Island, and support areas would greatly facilitate new programs gaining approval for testing or training. It would also establish dedicated places to do most or all of these types of activities in lieu of finding suitable locations for each program. Staging areas would also be established for operations of this type. Figures 2-7 through 2-9 show the types of activities that would occur under this alternative.

These activities will be evaluated in the Environmental Assessment based on surrounding land use constraints associated with a preliminary assessment of potential natural and cultural resources and IRP considerations. Table 2-1, shown previously, lists the type of mission activities that would occur in these areas. As with Alternative 2, Alternative 3 operations in these areas include certain operational constraints and management requirements associated with the actions described above. These operational constraints and management requirements are based on environmental impact analysis for identified resources and are described in Chapter 4 of this document.

Figure 2-7. LCAC Maneuvering on Beach

Figure 2-8. AAV Maneuvering on Beach

Figure 2-9. AAV Crossing a Water Body

2.3 COMPARISON OF ALTERNATIVES

Table 2-2 presents a comparison of the alternatives based on initial, preliminary analysis for potential impacts associated with the issues described previously in Section 1.4 and identifies the level of potential mission use constraints needed to minimize identified potential impacts.

Table 2-2. Potential Impact/Constraint Comparison of Mission Use Alternatives

Alternative	Mission Use/Activity												
Issue	A/S Testing	Electronic Systems & ECM Testing/ Training	Air Ops	S/S & S/A Missile Testing	Surface/ Subsurface Testing Support	Ground Testing/ Training	Personnel/ Equipment Drops/ Extractions	OA-HITL Testing/ Training	Surf Zone Testing/ Training	Small Boat Obscurant Testing	Sensor Testing w/ Obscurants	Live Fire/ Special Ops Training	LCAC Use
No Action													
Noise	A	A	A	A	A	A	A	A	A	A	A	A	A
DPI	A	A	A	A	A	A	A	A	A	A	A	A	A
HA	A	A	A	A	A	A	A	A	A	A	A	A	A
RA/S	A	A	A	A	A	A	A	A	A	A	A	A	A
Alternative 1													
Noise	⊗	○	⊗	λ	○	⊗	λ	⊗	A	○	○	A	A
DPI	λ	○	○	⊗	λ	λ	⊗	○	A	⊗	⊗	A	A
HA	⊗	○	○	⊗	⊗	λ	⊗	○	A	○	○	A	A
RA/S	λ	⊗	⊗	λ	⊗	λ	⊗	λ	A	⊗	⊗	A	A
Alternative 2													
Noise	⊗	○	⊗	λ	○	⊗	λ	⊗	λ	○	○	A	A
DPI	λ	○	○	⊗	λ	λ	⊗	○	λ	⊗	⊗	A	A
HA	⊗	○	○	⊗	⊗	λ	⊗	○	λ	○	○	A	A
RA/S	λ	⊗	⊗	λ	⊗	λ	⊗	λ	λ	⊗	⊗	A	A
Alternative 3													
Noise	⊗	○	⊗	λ	○	⊗	λ	⊗	λ	○	○	λ	λ
DPI	λ	○	○	⊗	λ	λ	⊗	○	λ	⊗	⊗	λ	λ
HA	⊗	○	○	⊗	⊗	λ	⊗	○	λ	○	○	λ	λ
RA/S	λ	⊗	⊗	λ	⊗	λ	⊗	λ	λ	⊗	⊗	λ	λ

DPI = Direct Physical Impact; HA – Habitat Alteration; RA/S = Restricted Access/Safety
A = Assessed as needed based on proponent need through 813 process; ○ = No potential Impact, No Potential Constraints
⊗ = Minimal Potential Impacts, Potential Minor Constraints/Considerations Recommended; λ = Potential Impacts, Constraints Necessary

2.4 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 3, which would result in the creation of a mission utilization plan for Santa Rosa Island designating specific areas on the Island for the current and past military testing and training activities described earlier and the establishment of new areas for surf zone testing/training, live fire exercises, and LCAC testing/training. Operational constraints and management requirements would be implemented for the designation of these areas and the associated activities that would take place within them in order to minimize potential impacts to the natural and anthropogenic (human) environment. Proposed mission activities would then be easily approved based on prior analysis of designated sites for particular actions. Therefore, the Preferred Alternative, Alternative 3, would provide the most utility for the DoD on the Island by establishing a mission utilization plan focused on mission diversity and based on minimizing potential impacts to identified natural and cultural resource constraint areas.

3. AFFECTED ENVIRONMENT

3.1 INTRODUCTION

The objective of the Affected Environment chapter is to define, inventory, and generally characterize the nature and condition of the physical, biological, and anthropogenic receptors within the realm of influence of the Santa Rosa Island and develop a framework for understanding spatial and temporal patterns.

Eglin AFB occupies 724 square miles of land area in the northwest Florida panhandle, east of Pensacola (Figure 1-1, in Chapter 1). This represents a major portion of the Florida panhandle's land area. Consequently, Eglin has a rich diversity of unique landscapes, habitats, and species that often fall under federal and state regulatory mandates. Eglin's award-winning Natural Resources Management Program, implemented to facilitate the environmentally conscious use of Eglin's natural resources, has been recognized on a national scale and was selected as the best in the Department of Defense.

Long-term planning for environmental management and stewardship requires a *working knowledge* of the natural and cultural features (living and nonliving receptors) of the potentially affected environment of all ranges on Eglin AFB. Consequently, attention is devoted to developing an inventory and description of receptor features that may be affected by the mission activities described in the previous section. The goal of the Affected Environment chapter is to create the tools for making scientifically sound decisions that are beneficial to the utilization of Santa Rosa Island and the environment as a whole. For this task, an attribute-driven inventory will identify, locate, characterize, and map the elements of individual receptors. The Santa Rosa Island affected environment receptor parameters and sequence of discussions are listed below.

- Physical Features
  - Geology – underlying earth formations and materials
  - Geomorphology – landforms and soils
  - Hydrology – surface water and groundwater
  - Climate – temperature, wind, rainfall
- Biological Resources
  - Sensitive Habitats – communities
  - Sensitive Species – plant and animal species
- Anthropogenic Resources
  - Cultural Resources – archaeological evaluations
  - Socioeconomics – demographics, economics, environmental justice
  - Anthropogenic Features – IRP sites, land use

3.2 SETTING DESCRIPTION

Santa Rosa Island, located in the southern section of Eglin AFB in Okaloosa and Santa Rosa counties, Florida, is a narrow barrier Island approximately 50 miles long and less than 0.5 mile 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. The Island is bordered on the south shore by the Gulf of Mexico and on the north shore by Santa Rosa Sound and Choctawhatchee Bay. Eglin controls 4,760 acres of Santa Rosa Island, a 4-mile strip eastward of Fort Walton Beach open for public recreation, and a restricted access 13-mile section extending to the west to Navarre Beach, Florida. There are 2.5 miles of Okaloosa County property between the two parcels of Eglin property. Each of the three sections of Island has unique characteristics (developed versus undeveloped land), and 15 Eglin AFB test sites are located on Santa Rosa Island (U.S. Air Force, 1997).

The surf zone area is shallow area covering the continental shelf seaward of the Island to a depth of approximately 30 feet. The distance from the Island shoreline, which corresponds to this depth, varies from approximately 0.5 mile at the western side of the AF property to 1.5 miles at the eastern side (Figure 1-2, in Chapter 1) extending out into the inner continental shelf. A sandbar is located offshore of TA A-15 in approximately 10 feet of water. Relict sand ridges form approximately NW at depths of about 60 feet and deeper. The DeSoto Canyon, at the edge of the shelf, is approximately 100 kilometers south of SRI (U.S. Air Force, 1997). Additional information on Eglin's Santa Rosa Island property is available in the *Integrated Natural Resources Management Plan, Eglin AFB, 2002-2006* (U.S. Air Force, 2002b).

3.3 PHYSICAL FEATURES

3.3.1 Landforms and Soils

Formation of the Island occurred within the last 6,000 years as eroding sediments from the east were deposited by currents (littoral drift) and wave action to form a ridge of sand parallel to the mainland (Wolfe and Reidenauer, 1988). Littoral drift and storm erosion currently influence both sides of the islands physical development, supplying sand from Choctawhatchee Bay and the continental shelf (Wolfe and Reidenauer, 1988). Erosion of island dunes furnishes additional littoral drift sediments.

The Island has been described as a barrier island complex, having the typical landforms of beaches, coastal dunes, interior dunes, and low-lying soundside beaches and marshes (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 5 feet above high tide. They exist in a high-energy environment of wind and wave activity, and because of this, are continually changing. Coastal dunes consist of primary dunes, closer to shore and subject to the greatest wind and wave forces, and behind these, more stable secondary dunes. Sands from primary dunes are periodically eroded and redeposited during times of high and low energy wave-action. The exposure to salt, waves, and wind limit the vegetation found on primary dunes.

Inland of the coastal dunes are the older, more vegetated, and more stable interior dunes. Gradual trapping of wind blown sands by the vegetation sometimes allows these dunes to build up to several meters in height. The interior dunes are usually aligned north to south from the effects of dominant southeast summer winds. Depressions between interior dunes are often basins for ponds and small lakes known as swales. The topography of SRI is shown in Figure 3-1.

Weaker littoral drift processes at work on the north side of the Island, through the Santa Rosa Sound, transport finer sediments than those that formed the south beaches. These fine sediments form tidal flats, which lead to the development of coastal marshes. Wind-blown dune deposits have also led to the formation of sandy beaches along the north shore.

The soils on Santa Rosa Island are mostly well drained, sandy soils belonging to the Beaches association and Newhan-Corolla association. Dorovan muck, Duckston sand, and Rutlege sand exist in the depressional areas. There are brackish ponds, and hundreds of other small wetlands composed of Dorovan muck. After heavy rainfall, the ponds may become fresh for brief periods. Likewise no well-developed drainages exist, but numerous coves and inlets may be found along the northern edge of Santa Rosa Island. The physical and chemical properties of the soil types found on SRI are shown in Table 3-1.

Table 3-1. Physical and Chemical Data of Soils on Santa Rosa Island

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	.5 - 3	0 - 4	>20
Dorovan muck	0 – 80	Grayish brown muck	<2	3.6 – 4.4	20 - 80	---	0.6 – 2.0

Dredge Sites

Currently, there are no dredged sites or dredged material disposal sites in the Gulf of Mexico within 3 miles of Santa Rosa Island. Santa Rosa Sound, the Coast Guard turning basin, and the East Pass have navigable channels that have been dredged and are dredged occasionally for maintenance. These areas also contain dredged material disposal sites. The island itself has sites designated for spoil disposal from dredging projects, and are discussed below.

The construction of Deckhand's Marina in 1964 required dredging a basin in Santa Rosa Sound for approximately one-third of the present slips. The rest of the slips are located on naturally deep water, which are state-owned submerged lands.

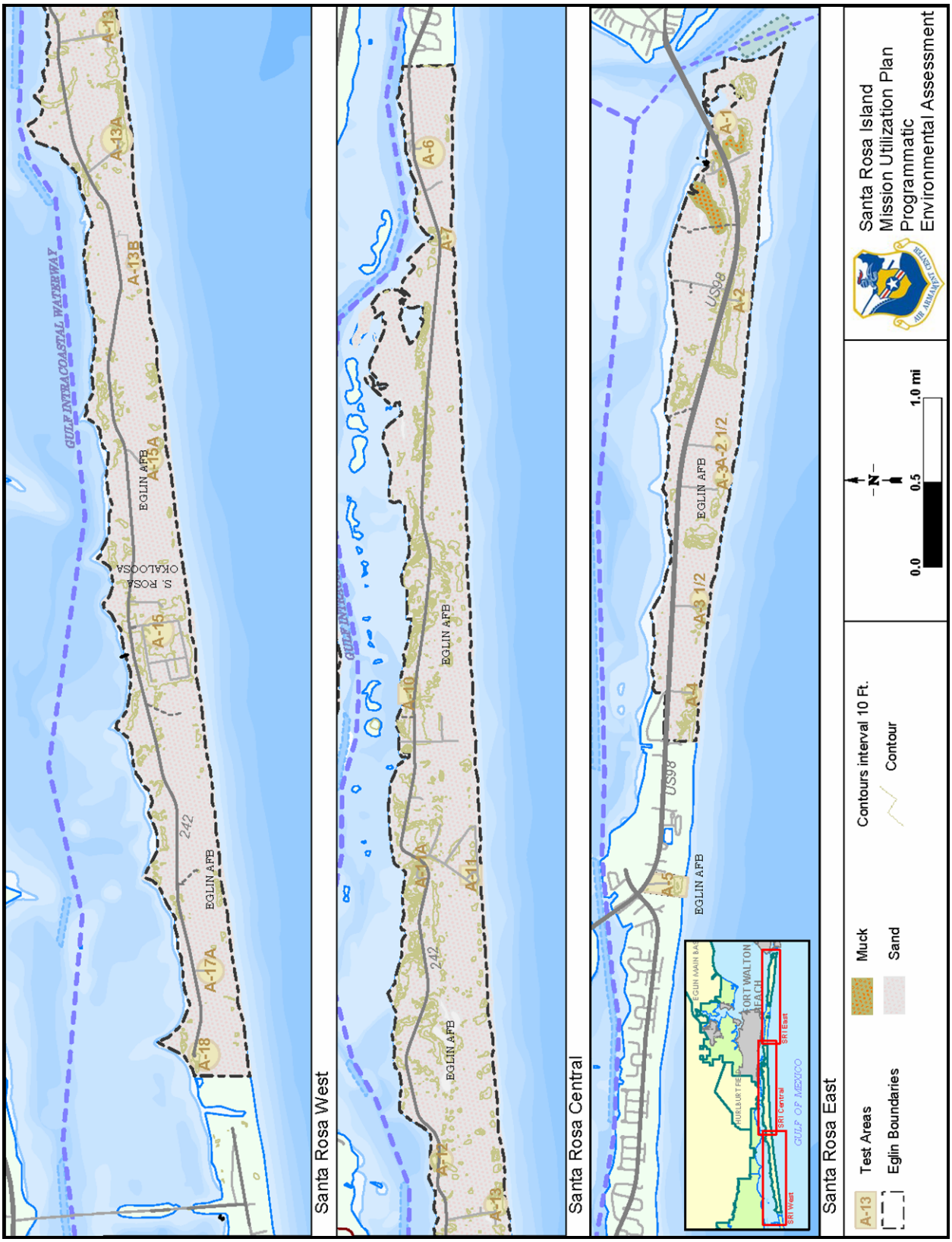

Figure 3-1. Soils and Topography of SRI

Dredge Spoil Disposal Areas

Spoils from channel dredging in Santa Rosa Sound have been disposed of in two ways by the U.S. Army Corps of Engineers. Most of the spoil material has been deposited on spoil islands in Santa Rosa Sound outside of the Gulf Intracoastal Waterway (ICW). These spoil islands are visible in aerial photographs in Santa Rosa Sound north of the federal property. The other method of disposal, which is more infrequent, has been placement of the spoils in shallow water and on beach areas of Eglin property on Santa Rosa Island. A historical, long term site for disposal of dredged material has been immediately west of site A-7, on the north side of the road (Atencio, 1996). Previous records of the amount of material deposited here are unavailable.

Hurricane Opal, which struck the coast in October 1995, caused shoaling of the Gulf ICW. Consequently, the U.S. Army Corps of Engineers (USACE), Mobile District, dredged portions of Santa Rosa Sound. The USACE received approval from Eglin to place dredged material at four sites on the island federal property that experienced blowouts of sand and dunes from the storm. These four sites are the beach area at site A-12, site A-7, immediately to the west of the guard gate, and the parking area by the lagoon at East Pass. A description of the proposed sites and types of materials deposited follows.

Site #1 (east of A-12): This was initially used as a spoil site for a beach renourishment project, with placement of approximately 5,500 cubic yards of material on a nonvegetated portion of the beach. Material was placed in the water and on the beach, from an eastern boundary (indicated by slash pine standing in open water) on towards the west.

Site #2 (site A-7): This site is used for materials dredged from the Gulf ICW, which has been used to "borrow" from for various sand requirements on Santa Rosa Island. A berm has been constructed along the northern boundary of the site, which ties into the remaining dune to the northwest. Materials at this site are utilized to rebuild the infrastructure on the island.

Site #3 (east of guard gate): This site was selected to expedite access to material for use in rebuilding, as the road to the borrow pit was destroyed during Opal. Much of the material was used to fill holes created by extensive scouring from the storm surge.

Site #4 (parking area next to lagoon): This site is used for disposal of material dredged from the Coast Guard basin and the East Pass in a designated parking area located south of U.S. Highway 98 and west of the Destin East Pass. Following deposition, material is shaped and later used for rebuilding requirements, including reconstruction of the parking area.

Erosion

Erosion problems on SRI have been particularly substantial on the Gulf of Mexico shoreline. Methods of beach maintenance are being assessed to reduce erosion potential. Approximately 1.5 miles of Hwy 98 on Santa Rosa Island was washed out as a result of Hurricane Opal's storm surge. Eglin's Natural Resources Section (96 CEG/CEVSN) initiated construction of sand fencing July 1996. Within the first year, the fence accumulated 3 to 4 feet of sand and was able to withstand the forces of Hurricane Georges in October 1998 (U.S. Air Force, 2003). The rebirth of sea oats (*Unolia paniculata*) and other grasses are key to spurring new dune growth near restoration areas.

Erosion of Santa Rosa Island has been accelerated by the construction of inlet jetties for East Pass in 1967 – 1969 and other construction activities. 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 (Foster et al., 1999). While this is the general case, weaker hurricanes such as Hurricane Danny (1997) actually created dune accumulation through storm-generating waves heaping massive amounts of sand onto the barrier island.

Overall, the soil erosion rates on SRI have slightly exceeded soil formation rates. This means that the movement of soil from its point of origin constitutes nonrenewable soil loss. Also lost with the moving topsoil are chemical compounds and materials, which may result in diminished site fertility and productivity. The erosion of shoreline tends to redistribute sediment into the water and littoral shelf areas. Although Hurricane Opal and Erin flattened dunes, the barrier island lost only five percent of its sediment volume (Northwest Florida Daily News, 1998).

Coastal armoring structures such as sea walls, bulkheads, and other similar structures have been built on the Island by residents with the intent of preventing excessive erosion from occurring on waterfront property. According to files kept on building alterations on Okaloosa Island (the developed portion of Santa Rosa Island that is within Okaloosa County) in the Okaloosa County Planning and Development Office, over 30 separate sea walls, bulkheads, and rip-rap have been constructed, repaired, or replaced on private or commercial property on the Island since 1983. All of these coastal armament structures have been built on the Santa Rosa Sound and Choctawhatchee Bay side of the Island.

Armoring is effective in protecting buildings immediately behind the structure. However, armoring structures can have a negative effect on property adjacent to the structure and immediately in front of the structure. Sea walls are not effective in absorbing energy of waves and therefore may lead to accelerated erosion to the side of and in front of the structure. Ultimately, this increased erosion leads to a decreased amount of shoreline and habitat.

3.3.2 Hydrology

The attributes of the surface and ground water systems found at Santa Rosa Island are discussed in the following narrative.

Groundwater

The northwest Florida aquifers associated with southern Okaloosa County are divided into four hydrostratigraphic units. In descending order from the surface, these units are the:

- Surficial Aquifer (SA)
- Intermediate System (IS)
- Floridan Aquifer (FA)
- SubFloridan System (SFS)

The Surficial Aquifer and Floridan Aquifer move and store substantial amounts of water because of their medium to high permeability, whereas the Intermediate and SubFloridan Systems are primary confining units of the aquifer system that have low permeability. The primary water supply for northwest Florida comes from the Surficial and Floridan Aquifers.

However, Santa Rosa Island contains extremely minimal potable water potential due to saltwater intrusion and low potentiometric surface levels of the aquifers. The aquifer system's potentiometric surface in the panhandle of Florida has gradually depleted over many years of pumping and over-withdrawal rates. The Okaloosa County School Board well, located in Fort Walton Beach, Florida, demonstrates the vast depletion rates. This well lost approximately 160 feet of head since 1936 (Ryan et al., 1998).

Okaloosa Island (the developed portion of Santa Rosa Island that is within Okaloosa County) lies within the service area of the Okaloosa County Water & Sewer System (OCWS). Potable water is supplied through a 16-inch water main that resides in a steel casing bored under Santa Rosa Sound near Brooks Bridge (Littrell, 2002).

In the past, OCWS operated four public water supply wells on the Island. The Northwest Florida Water Management District requested that OCWS cease pumping the island wells in the early 1990s. The request was honored and three of the four wells were properly abandoned by filling the casings and boreholes with concrete. The last of those three, the Beasley Park well, was formally abandoned in 1998, when sodium and chloride readings began to exceed the maximum contaminant level (MCL).

OCWS still maintains one public water supply well on the Island, which is referred to as the Amusement Park Well. It is located near the 200,000 gallon elevated water tank on the north side of Hwy 98 near the Island Steamer restaurant and the miniature golf course. It is used only as an emergency backup in case the 16-inch supply main is breached or has to be taken out of service. Recent testing at the Amusement Park Well shows sodium and chloride levels slightly below the MCL (Littrell, 2002).

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, 1995a).

There are brackish ponds and many other small wetlands, but no natural surface fresh water bodies on Santa Rosa Island. 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 Santa Rosa Island. Based on topography, surface water either drains into Choctawhatchee Bay or the Gulf of Mexico.

Surface Water Quality

Water quality is a measurement of the chemical and physical characteristics of a water mass that describes its suitability for specific uses. The state of Florida has developed and retains primacy for surface water quality standards for all waters of the state (FAC 62-301 and FAC 62-302) in accordance with the provisions of the Clean Water Act. A scoring system based on the data in the *Florida Water Quality Assessment, 2000 305 (b) Report* (FDEP, 2000) is used by FDEP to rate the quality of surface waters of the state. Florida surface waters were rated as follows.

- Fully Meets Use
- Partially Meets Use
- Does Not Meet Use
- Insufficient Data

Based on the above system, the surface water quality of rivers, streams, creeks, bayous, and bays in the region of influence was rated by the state. The marine waters seaward of Santa Rosa Island are defined as Class III (recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife) (FDEP, 2000). Water quality criteria for Class III marine waters are presented in Table 3-2.

Table 3-2. Water Quality Criteria for Class III Waters

Parameter	Units	Class III Marine
Turbidity	NTU	≤29 above background
Dissolved Solids	mg/L	None
pH	pH units	No more than one unit change for coastal waters or .2 unit change for open waters
Chlorides	mg/L	No increase >10 percent above background
Fluorides	mg/L	≤5.0
Conductivity	Micromho	None
Dissolved Oxygen	mg/L	Not average less than 5.0 and never be less than 4.0
BOD	mg/L	No increase such that DO drops below limit for any class.
Nutrients: Total Phosphorus, Total Nitrogen		No alteration in nutrients such that an imbalance in natural populations of aquatic flora or fauna results.
Total Coliform	#/100 ml	≤2,400 in any one sample
Fecal Coliform	#/100 ml	≤800 in any one sample
Copper	µg/L	≤2.9
Iron	mg/L	≤0.3
Lead	µg/L	≤5.6
Zinc	µg/L	≤86
Mercury	µg/L	≤0.025

Source: FDEP, 2000

Waves and Tides

Tides within the Santa Rosa Island region are diurnal and microtidal. The mean tide range at East Pass is 0.43 meters (m) with a spring tidal range of 0.51 meters (m). According to the Wave Information Study (WIS) of the Waterways Experiment Station, U.S. Army Corps of Engineers, 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 (Foster et al., 1999). There are several widely varying estimates of longshore sediment transport for this area. Most estimates range from 52,000 to 254,000 yd^3/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 (Foster et al., 1999).

3.3.3 Climate and Meteorology

Eglin is located in a transitional zone between temperate and subtropical climates. The climate is characterized by warm, humid summers and mild winters, prevailing southerly winds, and intense thunderstorm events and hurricane cycles (U.S. Air Force, 1995a). Thunderstorms, tropical storms, and hurricanes occurring within the ROI may affect the physical and biological appearance of Santa Rosa Island. Hurricane season begins 1 June and lasts through 30 November.

Data analyzed over the last 100 years indicate that the Gulf experiences an average of 17.7 storms annually, with each having a mean duration of 4.8 days (FAMU, 1988). The period of 1991 to 1994 was one of the least active for hurricanes on record. However, in 1995,

Hurricanes Allison, Erin, and Opal all made landfall in the Florida panhandle, causing extensive damage to property, dunes, and natural resources on Santa Rosa Island.

Temperatures range from a minimum average temperature near 36° F (2° C) in the winter to a maximum average temperature near 91° F (33° C) in the summer. Occasional frosts occur between November and February (Becker et al., 1989). Winter temperatures can reach as low as 15° F to 20° F with temperatures dropping to single digits during brief winter cold fronts (U.S. Air Force, 1996a). The relative humidity is high throughout the year. By early June, the temperature-humidity index (THI) is about 79 and remains between 79 and 81 during most afternoon hours until late September.

Rains occur primarily during the summer (June to August) and the late winter to early spring (February to April) and result from frontal-type weather systems and thunderstorms (Weather.com, 2003). Frontal storms cover a larger area and produce showers of longer duration and lower intensity than thunderstorms. The majority of summer rainfall is from intense thunderstorms in the late afternoon or early evening that last only one or two hours. Based on data collected over the last 30 years at the National Weather Service Cooperative Observation Site, Niceville, Florida, located a few miles due east of Eglin, the annual rainfall ranges from 65 to 84 inches.

The high intensity storms that frequent this area not only deliver significant amounts of rain, they also create frequent air-to-ground lightning strikes. Contact with fuel sources such as timber can easily start wildfires. No wildfires have occurred on SRI, but risk does exist in the sand pine scrub and swale habitat. Since prevailing winds on SRI are north/south and the vegetation is patchy, it would be unlikely fire would spread quickly or cover much area.

Prevailing winds are usually from the south in summer and the north in winter. Warm westerly winds originate from the Gulf of Mexico during the summer, providing cooling on-shore breezes along the coast. The Gulf moderates extremes in winter temperatures by providing heat in the winter. Winds from the northwest bring frontal systems of low precipitation and long duration in the winter. The lowest average velocity winds occur in August, and the windiest month is March.

Measurements of wind speed for 1995 through 1996 at Eglin Main showed a monthly average ranging from 6 to 9 knots.

Almost every morning, ground-based inversions occur on the Santa Rosa Island and break during the morning with surface heating. An inversion is an atmospheric condition in which the air temperature rises with increasing altitude, holding surface air down and preventing dispersion of pollutants. When the air temperature increases with height at a rate such that the air remains very stable and little mixing of the air occurs, there is an inversion. Ground-based inversions occur due to radiative cooling at the ground. For approximately five to seven days in the winter, the inversion does not break up due to a deep layer of sea fog that slows surface heating. Low wind speeds in these situations are typical (U.S. Air Force, 1995a).

3.3.4 Air Quality

Although mission activities at Eglin result in significant sources and volumes of air emissions, the regional air quality is good, attaining both federal and state standards. The input of air emissions from land areas within Santa Rosa, Okaloosa, Walton, Escambia, and Gulf counties is small due to the lack of heavy industry. Air pollutants are emitted from mobile and stationary

sources and general maintenance activities, government and privately owned vehicles, jet engine testing, aircraft operations, prescribed burning, wildfires, mission test and training operations, and the open burning/open detonation of unexploded ordnance (U.S. Air Force, 1995a). Table 3-3 describes the CY 2002 air emissions rates (tons per year) for the primary pollutants covered by federal and state standards (U.S. Air Force, 2003g).

Table 3-3. Air Emissions Rates at Eglin Air Force Base in CY2002

Emissions	Tons/Year*
Carbon monoxide	54.20
Nitrogen oxides	86.20
Volatile organic compounds	89.63
Particulate matter	129.10
Sulfuric oxides	10.77
Hazardous air pollutants	10.42
Ozone depleting compounds	4.42
Lead	0.01

Source: U.S. Air Force, 2003g
* Does not include prescribed burning emissions

3.4 BIOLOGICAL RESOURCES

This section describes the sensitive habitats and species that are found on Santa Rosa Island. Emphasis is placed on identifying sensitive habitats and species that are within federal and/or state mandates or are of special concern.

3.4.1 Sensitive Habitats

Sensitive habitats found on the Eglin portion of SRI and nearby waters include wetlands, floodplains, Coastal Protection Areas, Essential Fish Habitat as identified in the Magnuson-Stevens Fisheries Act, and critical habitat for sensitive species as identified by the USFWS.

Barrier Island Ecological Association

A classification system of ecological associations has been developed based on flora, fauna, and geophysical characteristics. These ecological associations are described in the *Integrated Natural Resources Management Plan*, Eglin AFB, (U.S. Air Force, 2002b). Santa Rosa Island falls under the barrier island ecological association, and its entire terrestrial area is classified as Coastal Upland Community. Within this community are sand beaches, beach dunes, coastal grassland, coastal interdunal swales, mesic flatwoods, and scrub communities. The acreages of each community type, as measured in 1992, are listed in Table 3-4, and the plant species normally found in the ecological communities of SRI are listed in Table 3-5. Figure 3-2 provides a graphical representation of the ecological associations found in the vicinity of Santa Rosa Island.

Table 3-4. Acreage of Santa Rosa Island (Eglin AFB) Coastal Upland Community Types

Communities	Acreage
Beach dune	393
Coastal grassland	1,140
Coastal swale	1,217
Scrub-goldenrod	1,140
Scrub-rosemary	396
Scrub-oak	30
Scrub-sand pine	259
Maritime hammock	10
Mesic flatwoods	171
Total Acreage	**4,756**

Source: Johnson et al., 1992

Table 3-5. Plant Species Commonly Found in the Barrier Island Ecological Association

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

Source: Johnson and et al., 1992

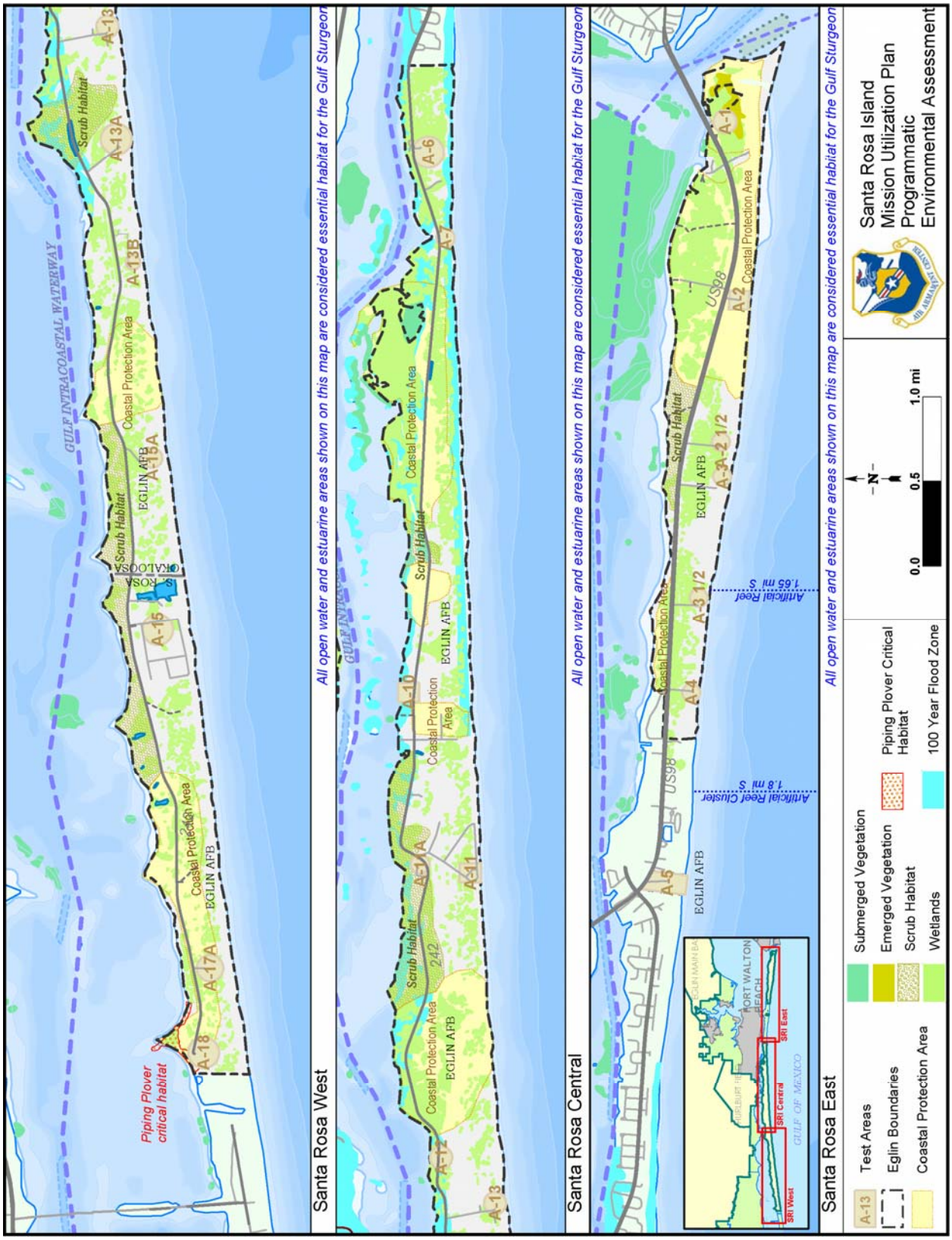

Figure 3-2. Sensitive Habitats of SRI

Wetlands

Regulatory Overview

Wetlands are defined in the U.S. Army Corps of Engineers (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" (U.S. Army Corps of Engineers, 1987). All jurisdictional wetlands in the United States meet three wetland delineation criteria (hydrophytic vegetation, hydric soils, and wetland hydrology) and are protected under Section 404 of the Clean Water Act (33 United States Code Section 1344) and its implementing regulations found in 40 Code of Federal Regulations 230. Wetlands on federal lands are further protected under Executive Order (EO) 11990, which states "...each federal agency shall provide leadership and shall take action to minimize the destruction, loss, or degradation of wetlands...."

FDEP's wetland program regulates dredge and fill activities in both fresh and salt waters under their jurisdiction. Waters adjoining Florida's coastline are also under the state's jurisdiction. Permit applications made to the FDEP can also serve as joint applications to initiate concurrent review by the USACE.

When considering a ground-disturbing project or action occurring in a wetland, numerous steps are required. First, the presence or absence of a wetland within the project site determines the potential for impacts and the need for necessary permits. Once potential impacts have been identified, this action cannot be taken if a practicable alternative exists. If, however, no practicable alternative exists to the proposed action, mitigation must be taken to minimize impacts in or adjacent to wetlands and should be implemented early in the site planning process to reduce or eliminate direct and indirect impacts. The USACE and FDEP both have a formal process for determining a jurisdictional wetland. This delineation process would be accomplished in coordination with 96 CEG/CEVCE, 96 CEG/CEVSN, 16 SOW/CEV, and the proponent or his contractor.

Before an action adversely impacting wetlands may proceed, EO 11990 requires the head of the agency to find that there is no practicable alternative to conducting the action in wetlands. Mitigation measures may be necessary to minimize impacts. Additionally, an environmental assessment or a finding of no practicable alternatives report must be prepared and public notice of intent must be made before proceeding with USACE consultation.

Ecological Description

Wetland areas are sensitive habitat that are inundated (water covered), or where water is present either at or near the surface of the soil for distinguishable periods of time throughout the year. Local hydrology and soil saturation largely affects soil formation and development, as well as the plant and animal communities found in wetland areas. Hydric (wet), anaerobic (lacking oxygen) sediments resulting from the presence of water typify wetlands.

The following wetland types on SRI have been identified using the National Wetlands Inventory (NWI) GIS data, as shown in Figure 3-2.

- 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 not too severe. This community varies in amount in small pockets along the northwestern margin of Santa Rosa Island and occurs in narrow bands along the periphery 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 Santa Rosa Island are inland wetlands, which can be categorized as basin wetlands, depression marshes and freshwater marshes, all of which have similar characteristics. These wetlands are characterized as shallow, closed basins with outlets usually only in times of high water; are composed of peat or sand substrate, are usually inundated; and exhibit woody or herbaceous wetland vegetation. The depression marshes comprise more than 90 percent of the wetlands found on the island. Depression marshes are shallow, generally ephemeral, 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.

Some small, isolated freshwater marshes occur on SRI. These are usually found in low troughs and swales behind the dune lines. Tree and shrub species are usually absent but may be found adjacent to these 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. They are coarse, textured, or organic and are underlain with sand.

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

Floodplains and the Coastal Zone Management Act

Regulatory Overview

Any actions being considered by federal agencies must be evaluated to determine whether they would occur within a floodplain (Executive Order 11988, Floodplain Management). 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).

The term "coastal zone" is defined as coastal waters and adjacent shorelands strongly influenced by each other and in proximity to the several coastal states, and including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. "Coastal waters" are defined as any waters adjacent to the shoreline that contain a measurable amount of sea water, including but not limited to sounds, bays, lagoons, bayous, ponds, and estuaries. The 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. The proposed action is to be conducted within Eglin airspace, land ranges, and water resources. As such, some components of this action would take place within the jurisdictional concerns of the Florida Department of Environmental Protection and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the Coastal Zone Management Act. FDEP also regulates activities in jurisdictional waters/wetlands through the Dredge and Fill Permitting Program.

Executive Order (EO) 11988, Floodplain Management (1977, 42 Fed. Reg. 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.

Additionally, EO 11990, Protection of Wetlands (1977, 42 Fed. Reg. 26961), places additional requirements on floodplains when considered as wetlands in the EO. It requires federal agencies to avoid undertaking or providing assistance for new construction located in wetlands unless there are no practicable alternatives and all practicable measures to minimize harm to wetlands have been implemented. It also precludes federal entities from leasing space in wetland areas unless there are no practicable alternatives.

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 U.S. Army Corps of Engineers section 404 Permit Program, regulate alterations to wetlands to preserve both the amount and integrity of the nation's remaining wetland resources.

The Coastal Zone Management Act (CZMA) provides for the effective, beneficial use, protection, and development of the U.S. coastal zone. Federal agency activities in the coastal zone are required to be consistent to the maximum extent practicable with approved State Coastal Zone Management Plans. Federal agencies make determinations whether their actions are consistent with approved state plans and submit these determinations for state review and concurrence. All relevant state agencies must review the proposed action and issue a consistency determination. The Florida Coastal Management Program (FCMP) is composed of 23 Florida statutes administered by 11 state agencies and four of the five water management districts.

The Florida Department of Environmental Protection (FDEP) will serve as the lead agency in FCMP matters at Eglin AFB. Information submitted to the state of Florida for consistency review will go through the Florida State Clearinghouse (Clearinghouse), located within the

FDEP. The Clearinghouse will serve as the single point of contact for the various agencies. The information will be routed to all the appropriate state, regional, and local reviewers. Recommendations regarding the activity's consistency are provided by member agencies to the FDEP, which makes the state's final consistency determination.

Floodplain Description

Floodplains are lowland areas adjacent to surface water bodies (i.e., lakes, wetlands, and rivers) that are periodically covered by water during flooding events. Floodplains carry and store floodwaters during flood events. Floodplains are biologically unique and highly diverse ecosystems providing a rich diversity of aquatic and terrestrial species, acting as a functional part of natural systems. Floodplain vegetation and soils act as water filters, aiding in the removal of excess nutrients, pollutants, and sediments from the water. Flooding on Eglin AFB could occur as a result of rainfall within the base's drainage basins, hurricanes, or a combination of both. Figure 3-2 shows the 100-year flood inundation area. Floodplains are present on Santa Rosa Island from A-13A to just east of A-6 along portions of the shore, mostly on the soundside. The 100-year floodplain is considered a Wetland Resource Area under the Wetlands Protection Act.

Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act require, among other things, that the National Marine Fisheries Service (NMFS) and regional Fishery Management Councils designate essential fish habitat (EFH) for species included in a fishery management plan. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Federal agencies that fund, permit, or carry out activities that may adversely affect EFH are required to consult with NMFS regarding potential impacts, and respond in writing to NMFS and Fishery Management Council recommendations. Adverse impacts are defined as impacts that reduce quality and/or quantity of EHF, and may include contamination, physical disruption, loss of prey, and reduction in species' fecundity. EFH present in the area includes emergent vegetation, submerged aquatic vegetation (seagrasses), *Sargassum*, and artificial reefs/underwater obstructions.

Emergent Vegetation

Emergent vegetation species occur in isolated locations in Santa Rosa Sound as areas of saltmarsh and beach vegetation. North Florida marshes typically support *Juncus roemerianus* (black needle rush), *Spartina* sp. (smooth cordgrass), *Distichlis spicata*, *Scirpus* spp., *Salicornia* spp., and *Phragmites australis* among others (Wolfe and Reidenauer, 1988). The primary occurrence of these species on Santa Rosa Island appears to be primarily a wetland or beach component and not as fish habitat, since inundation by marine or estuarine waters occurs only during storm events. As such, the areas on the Sound side of Santa Rosa Island are technically considered wetland and are not providing fish habitat. As a result, these areas are addressed in this document as a part of the wetland environment.

Seagrasses

The Florida Marine Research Institute estimates total seagrass coverage in Choctawhatchee Bay and the Okaloosa County portion of Santa Rosa Sound at 4,160 acres (Sargent et al., 1995). The habitat on the Gulf side of Santa Rosa Island is a sandy/silty substrate, which does not support seagrass beds. The nearest major seagrass bed in the Gulf of Mexico is located to the southeast of Cape San Blas, outside of the study area.

Sargassum Community

Sargassum, or Gulfweed, a dominant genus in surface marine waters, is a free-floating brown algae that is present in the tropics and subtropics including the Gulf. *Sargassum* drifts as mats in oceanic eddies, provides an important niche for numerous species, and supports a unique community of animals. Fish may use *Sargassum* clumps for food or as habitat to lay their eggs. Between 1971 and 1976, 15 families and 40 species of fish were collected at 62 *Sargassum* locations within the eastern Gulf (Bortone et al., 1977). Sea turtle hatchlings also use *Sargassum* as a vehicle for passive migration and shelter and the abundance of invertebrate fauna that inhabit the mats is an important food source for sea turtles.

Artificial Reefs

Artificial reefs consist of materials deposited on the ocean floor, usually for the purpose of enhancing fishing or other recreational activities. Artificial reefs provide bottom relief and habitat for fish and other marine species in areas that may otherwise be featureless. Artificial reefs exist offshore of A-4 in the Gulf and there is a shipwreck near shore east of A-15A.

Coastal Protection Areas

Based on a 1992 FNAI report on coastal upland communities (Johnson et al., 1992), Coastal Protection Areas were designated on Santa Rosa Island. These were areas that had extremely good scrub habitat and areas where the reindeer 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.

Critical Habitat

Critical habitat is defined by the Endangered Species Act (ESA) 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. For Eglin Air Force Base, critical habitat has been designated for two species, the Gulf sturgeon and the piping plover.

Critical Habitat for Gulf Sturgeon

The Gulf sturgeon inhabits offshore areas and inland bays during the winter months and moves 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. Within the region of influence, sturgeon occur in the Yellow River in the spring and summer, and in Choctawhatchee Bay, Santa Rosa Sound, and the Gulf of Mexico in the winter. The final rule for Gulf sturgeon critical habitat was published in the Federal Register on 19 March 2003. As pertains to this study area, the nearshore waters (out to 1 nautical mile) along the Gulf of Mexico between Pensacola and Apalachicola Bays, Florida, as well as Santa Rosa Sound and the waters of the Choctawhatchee Bay system, have been designated as critical habitat. This area contains winter feeding and migration habitat for Gulf sturgeon (Figure 3-2, above).

Critical Habitat for Piping Plover

The preservation of critical habitat in wintering areas is important to the survival of piping plover populations. Quality winter foraging and roosting is necessary if adults are to survive, migrate back to breeding sites, and nest successfully. Critical habitat designation for wintering and breeding grounds for the piping plover was published in the Federal Register on 10 July 2001. Within property administered by Eglin, critical habitat for wintering plovers is situated on the north shore of SRI near Test Site A-18 (Figure 3-2, above). Due to the changing morphology of the shoreline at SRI, the boundaries of critical habitat are subject to change. Guidelines published in the Federal Register should be referenced if there is any question regarding boundaries.

Marine Protected Areas

A marine protected area (MPA) is defined as any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide protection for the natural or cultural resources therein. MPAs may include national marine sanctuaries, fishery management zones, national parks, state preserves, and many other types of areas. Federal agencies whose actions affect the resources protected by an MPA must identify the actions and, to the maximum extent practicable, avoid harming the resources. Several such areas exist in the eastern Gulf of Mexico, but only two offshore areas are located within or close to the area of study. These areas are the Reef Fish Stressed Area and the Desoto Canyon Closed Area. The Reef Fish Stressed Area is a Federal Fisheries Management Zone and includes inshore coastal waters throughout the Gulf. The purpose of the area is to rebuild declining reef fish stocks. Commercial bottom trawling, roller trawls, and commercial traps are not allowed in the area. The Desoto Canyon Closed Area exists offshore of the western Florida panhandle and Alabama coast. The purpose of this area is to reduce the number of undersized swordfish, billfish, and other species incidentally caught with pelagic longline gear. As such, commercial fishing is not allowed in the area.

3.4.2 Sensitive Species

Sensitive species include those with federal endangered or threatened status, federal candidate species, and state endangered, threatened, and species of special concern status. 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 in the future throughout all or a significant portion of its range due to loss of habitat, anthropogenic effects, or other causes. Federal candidate species and all state listed species are those that should be given consideration during planning of projects, but have no protection under the Endangered Species Act. Marine mammals, which are protected under the Marine Mammal Protection Act, are also addressed in this section.

Eglin Natural Resources Section (96 CEG/CEVSN) protects numerous plant and animal species through habitat management, specifically through the management of habitats and species identified as conservation targets by The Nature Conservancy (Sutter et al., 2001). By addressing the needs of conservation targets, which include sensitive, important, and unique habitats and species, 96 CEG/CEVSN indirectly supports the management of other species and habitat, including state listed species. Table 3-6 lists sensitive species that occur on and around Santa Rosa Island. See Appendix C for more information on sensitive species.

Table 3-6. Endangered, Threatened, and Rare Flora and Fauna Associated With SRI, Eglin AFB

Scientific Name	Common Name	Status
FISHES		
Acipenser oxyrinchus desotoi	Gulf Sturgeon	FT, SSC
REPTILES		
Caretta caretta	Loggerhead Sea Turtle	FT, ST
Chelonia mydas	Green Sea Turtle	FE, SE
Dermochelys coriacea	Leatherback Sea Turtle	FE, SE
Lepidochelys kempii	Kemp's Ridley Sea Turtle	FE, SE
BIRDS		
Charadrius alexandrinus	Snowy Plover	ST, C
Charadrius melodus	Piping Plover	FT, ST
Egretta caerulea	Little Blue Heron	SSC
Egretta thula	Snowy Egret	SSC
Egretta tricolor	Tricolor Heron	SSC
Eudocimus albus	White Ibis	SSC
Rynchops niger	Black Skimmer	SSC
Sterna antillarum	Least Tern	ST
MAMMALS		
Peromyscus polionotus leucocephalus	Santa Rosa Beach Mouse	CT
Trichechus manatus	West Indian Manatee	FE, SE
Tursiops truncatus	Atlantic Bottlenose Dolphin	MMPA
PLANTS		
Cladonia perforata	Florida Perforate Lichen	FE, SE, CT
Drosera intermedia	Spoon-leaved Sundew	ST

FE = Federally endangered, FT = Federally threatened, C = Federal candidate, MMPA = Marine Mammal Protection Act, CT = Eglin/FNAI conservation target, SE = State endangered, ST = State threatened, SSC = State species of special concern

Figure 3-3 shows the locations of various sensitive species and critical habitat on SRI.

Invasive Non-Native Species

Invasive non-native species include plants, animals, insects, or other organisms that are not native to an area and that threaten the natural biodiversity and functioning of an ecosystem. The introduction and spread of non-native invasive species may also create significant, negative issues for military training or for other anthropogenic land uses.

Invasive Non-Native Plant Species

Invasive non-native plant species have been documented at multiple locations on Santa Rosa Island. 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. The following are invasive non-native plant species documented on SRI. Chinese tallow, cogon grass, and torpedo grass have been prioritized as the greatest threats to SRI because of their current abundance, dispersal mechanisms, and historical documentation.

Figure 3-3. Sensitive Species of SRI

Chinese Tallow

Eglin first identified Chinese tallow colonization on Santa Rosa Island in 1996 during the assessment of impacts from Hurricane Opal. Chinese tallow (*Sapium sebiferum*) 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 their dispersal very difficult to control. Control efforts by hand removal (pulling seedlings) began in 1997/1998, and it soon was apparent that herbicide treatments would be required.

Cogon Grass

On Santa Rosa Island, cogon grass has been documented at multiple locations with most occurrences linked to test sites or road maintenance activities. Cogon grass (*Imperata cylindrica*) is an upland weed, but it also occurs in places that become briefly flooded. Because of its extreme invasiveness and its ability to rapidly cover large areas, it is considered one of the world's 10 worst weeds. 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 has been found on SRI. Torpedo grass (*Panicum repens*) 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 or runners 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. To date, no herbicide treatments have been conducted on this species.

Other 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 NRB will be closely watching these species to ensure they do not spread, and treating them where necessary.

Non-Native Animal Species

The effects of non-native animal and insect species on sensitive island species have been documented. Non-native animals prey on many rare and sensitive species, compete with native species for resources, and can carry rabies and other infectious diseases that may infect native wildlife. Coyotes, red fox, feral cats, fire ants, and cactus moths are non-native invasive animal species known to inhabit SRI.

Feral Cats

Feral cats are a major predator on native wildlife species. Over time, and with the assistance of humans, feral cats have become established on Santa Rosa Island. Feral cats hunt nesting shorebirds (least tern, black skimmer, snowy plover), Santa Rosa beach mice, and other birds and wildlife. Feral cats have also been documented to prey on sea turtle nestlings at other locations. Due to recent feral cat control efforts, feral cat numbers appear to be stable on Santa Rosa Island, but will require continued control efforts to maintain or lower the current population.

Coyote

The coyote has expanded its range into the southeastern United States and is considered non-native to Northwest Florida coastal areas by the USFWS and the Florida Fish and Wildlife Conservation Commission (FWC). 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 (FNAI, 1994). 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 considered by the USFWS and the FWC 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 and significantly reduce future sea turtle populations. Fire ant predation of sea turtle nests on Eglin AFB barrier island property has not been documented. However, in previous years, Cape San Blas has experienced problems with fire ant depredation to 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 predates on native cacti. The late instar caterpillars eat any prickly pear cactus with flat pads.

3.5 ANTHROPOGENIC RESOURCES

3.5.1 Cultural Resources

The National Historic Preservation Act of 1966 as amended (NHPA) requires federal agencies to consider the effects of its undertakings on historic properties listed, or eligible for listing, in the National Register. Cultural resources consist of prehistoric and historic districts, sites, structures,

artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. Historic properties are cultural resources included in, or eligible for inclusion in, the National Register of Historic Places (National Register) maintained by the National Park Service. The National Register includes artifacts, records, and remains that are related to and located within such properties.

Under Section 106 of the NHPA, when a federal action meets the definition of an undertaking, the federal agency must consult with the State Historic Preservation Officer (SHPO) and any other identified consulting parties. The federal agency is responsible for determining whether any historic properties are located in the area and assessing whether the proposed undertaking will adversely affect the resources. The federal agency is also responsible for notifying the SHPO and the Advisory Council on Historic Preservation of any adverse effects. An *adverse effect* is defined as any action that may directly or indirectly alter the characteristics that make the property historic (and thus eligible for listing on the National Register). The federal agency then consults with the SHPO to develop measures to avoid, minimize, or mitigate the adverse effects of the federal undertaking.

In addition to the NHPA, the Native American Graves Protection and Repatriation Act (NAGPRA) mandates that federal agencies consult with federally recognized Native American tribes to identify, evaluate, and treat historic properties that have religious or cultural importance to those groups. Department of Defense Instruction 4715.3 and AFI 32-7065 (U.S. Air Force, 1994) require military installations to initiate government-to-government consultation with Native American tribes and identify lands of religious or sacred interest. Eglin AFB has identified federally recognized tribes that have historic ties to the local area, which will be consulted with to identify sacred and religious sites that are located within Eglin boundaries.

In the 1980s Eglin conducted a surface survey of Santa Rosa Island. In 2002, Eglin AFB, in concurrence with the State SHPO, reevaluated the Island. The entire island is now considered a High Probability Zone for the occurrence of archeological resources. This land is considered a High Probability Zone because of its proximity to the Gulf and the Bay. Additionally, because of the gradual rise in the sea level since 1600 BC, submerged prehistoric sites may be present in the Gulf 30 to 40 kilometers from the shore. Eglin has also developed a high probability model for locating undiscovered shipwrecks in the Eglin Gulf Test and Training Range. The closest high probability area of undiscovered shipwrecks is 20 kilometers south of the western edge of the SRI ROI. The remaining areas are over 50 kilometers farther.

The SHPO also determined that the earlier walkover survey was not sufficient. Archeological survey and testing conducted in 2003 revealed many additional potential archeological sites. A good portion of Santa Rosa Island has been surveyed using more precise methods, and at the time of this document 1,810 acres of Santa Rosa Island have been surveyed and tested. There are over 35 suspected archeological sites. While there are numerous resources present on SRI and large portions of non-surveyed high probability areas, several cultural resources sites on Santa Rosa Island are listed in Table 3-7. Due to site sensitivity, exact locations of cultural resource sites cannot be shown. As a result, planners are encouraged to consult early with Eglin's Cultural Resources Branch (96 CEG/CEVH) for future activities and decisions. 96 CEG/CEVH will be able to provide the most current guidance at that time.

Table 3-7. Representative Cultural Resources Sites – Santa Rosa Island

Site #	Eligibility for NRHP	Comments
8OK240	Ineligible	Prehistoric shell midden
8OK244		Prehistoric shell midden
8OK182	Eligible	Mississippian
8OK152		Mississippian/contact
8OK153		Shell mound with evidence of occupations from early Woodland to contact period
8OK176		Late woodland site
8OK175		Mississippian Village
8OK241		Prehistoric shell midden
A-15A Historic District		Bomarc Test Site

3.5.2 Socioeconomics

Santa Rosa Island is an integral element of the Emerald Coast economy. Santa Rosa County, Okaloosa County, and Walton County have an interdependent economy that is heavily influenced by the military presence. The three counties also depend on tourism as a base industry supporting local economics. The Island is both a centerpiece attraction for tourism and a unique area for military training and testing.

The military and the local economy rely heavily on the unique resources of the Island. On Santa Rosa Island, 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 three counties has been or is the process of significant development to support this increased tourism. Eglin controlled areas of Santa Rosa Island, however, remain immune to commercial development. Vacationers enjoying the undeveloped island beach are nourishing continued commercial development of the three counties' tourism industries. Lastly, shipping and commercial fishing are significant base industries that are influenced by the SRI ROI.

Region of Influence

The SRI ROI directly influences the economy of Santa Rosa County and Okaloosa County. Walton County is affected to a lesser extent. Bay and Escambia counties are impacted by fishing off the coast and commercial shipping through the Sound and the bay. The general economic welfare of these five counties may impact other counties neighboring to the north, east, and west; however, SRI ROI activities are relatively insignificant to their economy. Holmes, Jackson, Washington, and Calhoun counties are rural economies that rely on agricultural, timber, and manufacturing. Gulf County to the east has its own beach tourism and military assets that do not depend on the SRI ROI.

Population is the central element of the socioeconomic analysis of the region. The population of the two primary counties has grown significantly recently, and is forecasted to continue to grow (Tables 3-8 and 3-9). The distribution of population across the counties within the ROI is presented in Figure 3-4.

Table 3-8. Populations of Santa Rosa and Okaloosa Counties Within the ROI

County	2000 Population	1990 Population	Percent Change
Okaloosa County	170,498	143,776	18.6%
Santa Rosa County	117,743	81,608	44.3%
Total	288,241	225,384	27.9%

Source: U.S. Bureau of the Census, 2001

Table 3-9. Population Forecast 2015

County	2000 Population (a)	2015 Population (b)	Percent Change
Okaloosa County	170,498	208,100	+ 22%
Santa Rosa County	117,743	152,600	+ 30%
ROI Total	***288,241***	***360,700***	***+ 25%***
State	**15,982,378**	**20,216,700**	**+ 26%**

Source: (a) U.S. Bureau of the Census, 2001; (b) University of Florida, 2001.

SRI ROI Industries

The four most apparent industries reliant on Santa Rosa Island and the neighboring water bodies are tourism, fishing, shipping, and the military.

Tourism

Tourism in the SRI ROI has significantly increased since1988, especially in Okaloosa County. Tourism is the largest private industry in Florida and the largest private industry in Okaloosa County (Okaloosa County Tourist Development Council, 2002). Each of the ROI counties has created a Tourism Development Council (TDC) under Chapter 125.0104, Florida Law, which enables each county to levy a tourist development tax, also known as the "bed tax," placed on transient lodging facilities and paid by visitors to the counties.

Since the TDC began operations, tourist development income has increased an average of 10.5 percent each year since 1989/1990 in Okaloosa County. An estimated 4.5 million tourists visited the Okaloosa County area in 1999/2000, compared to 49 million visitors traveling to Florida in 1999. This provided an estimated $950 million in economic activity to this area, a large increase from $134 million in 1989/1990. In addition, this activity supported an estimated 32,000 local tourism related employment opportunities (Okaloosa County Tourist Development Council, 2002).

Eglin AFB plays a vital role in SRI ROI tourism and growth with the stewardship of the base areas that are open to the public. Portions of Santa Rosa Island are open to public access near the Destin Pass. These open, undeveloped beaches that belong to Eglin AFB are used very heavily.

Choctawhatchee Bay/Santa Rosa Sound

As of 1994, 14,741 registered commercial and recreational vessels were operating in Okaloosa County and 2,576 registered vessels were operating in Walton County; an estimated 10 to 15 percent of the vessels were personal watercraft (Joyner, 1995). In 2000, there were 15,516, 3,803, and 11,185 registered vessels in Okaloosa, Walton, and Santa Rosa counties, respectively.

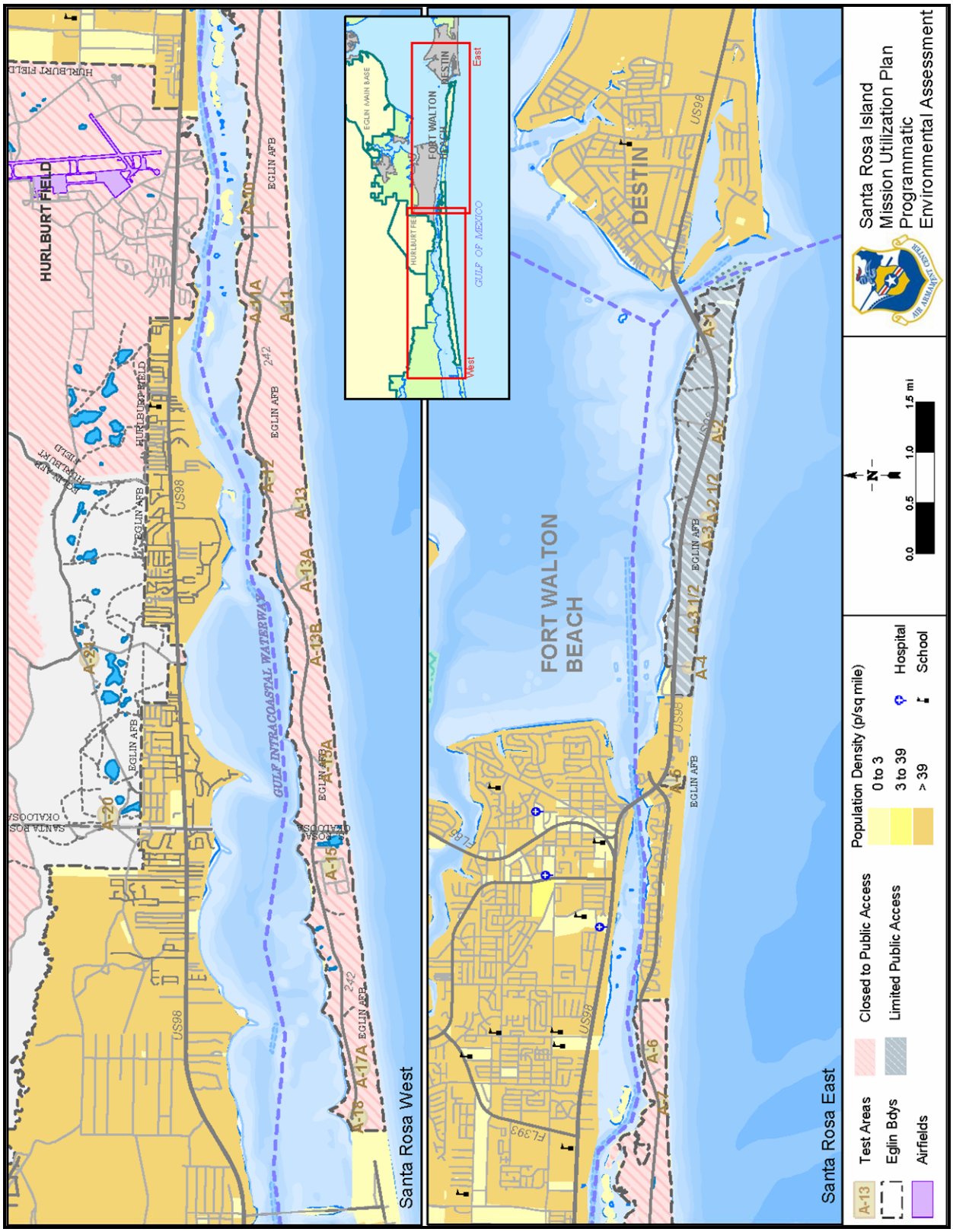

Figure 3-4. Distribution of Population Across Florida Counties Within the ROI

Reported revenues from Choctawhatchee Bay commercial fishing totaled $2.7 million for 1990 through 1994. The Gulf of Mexico catch totaled $17 million (86 percent of revenues) over the same five-year span (FDEP, 1995). Problems associated with fishing and boating include depletion of stocks, destruction of habitat, and degradation of water and sediment quality. Marina construction was cited as a contributor to bayou metal contamination. Lead, copper, tin, petroleum, and raw or partially treated sewage may also originate from boat usage (Barnett and Teehan, 1989).

The Gulf Intracoastal Waterway crosses through several northern Gulf inland water bodies and is the primary shipping route through Choctawhatchee Bay and Santa Rosa Sound for vessels transporting oil, coal, chemical products, and other bulk items. The U.S. Army Corps of Engineers (USACE) maintains data on the number of vessels using the waterway, as well as the amount of items shipped. From 1990 to 1999, vessels (tankers, tugs, and barges) averaged 8,400 trips over the Intracoastal Waterway through Choctawhatchee Bay. Approximately 115 million tons per year are transported by barges traveling about 250,000 boat-miles through the bay.

Socioeconomic Interdependencies

The Eglin ROI provides the resources (skilled labor) and high technology industrial production to enable Eglin AFB to conduct its DoD missions and activities. It also provides the living environment and setting to ensure a high quality of life and excellent access to higher education (University of West Florida, Florida State University, and University of Florida). Eglin AFB responds with the requirements that utilize these key resources to produce critical test, training, and evaluation activities within a balanced framework of environmental sustainment and economic balance.

As the ROI grows in population size and economic activity, the interdependencies of skilled labor, technology, education, and environmental sustainment will continue to play an important part. The fact that Eglin's military and federal civilian government earnings in 1999 comprised 37 percent of Okaloosa County's total earnings of $3,114,151,000, whereas in 1989 it was 44.1 percent of Okaloosa County's total earnings of $1,764,729,000 (U.S. Bureau of Economic Analysis, 2001), does not lessen the need for close and continuous regional dialogue.

Humans inevitably create features on the landscape or engage in activities that have varying degrees of influence on the environment. This section identifies existing conditions or features that characterize historic and active human influence on the environment associated with Santa Rosa Island. Anthropogenic considerations on Santa Rosa Island include socioeconomics, Installation Restoration Program/Area of Concern, Points of Interest and Radioactive Waste (IRP/AOC/POI/RW) sites, and cultural resources.

3.5.3 Environmental Justice

Concern that minority populations and/or low-income populations bear a disproportionate amount of adverse health and environmental effects led to the issuance of Executive Order 12898 in 1994. Executive Order (EO) 12898, Environmental Justice (EJ), and the accompanying Memorandum ensure that federal agencies focus attention on:

> *The environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities, and low income communities, when such analysis is required by NEPA 42 USC section 4321 et seq.*

The USEPA responded by developing the Environmental Justice Strategy that focuses on the agency's efforts in addressing these concerns. The U.S Air Force published additional guidance called *The Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP)* (U.S. Air Force, 1997b). This Guide contains a general approach for conducting EJ analysis in conjunction with Air Force Instruction (AFI) 32-7061 (EIAP) (U.S. Air Force, 1995). This is the first step in conducting an EJ assessment for Eglin AFB. Additionally, the USEPA Region 4 office has a set of EJ guidelines to follow. This region has a methodology that analyzes demographic data for the affected communities that assists in analyzing the adverse environmental impacts for minority and low-income populations.

This EJ requirement involves a calculation of potential minority and low-income areas for the Eglin ROI using the best credible data. The demographic profile of the region in which the project area is located provides the context within which the EJ is conducted. Table 3-10 lists the percentage of minority and low income against the Community of Comparison (CoC) results. The CoC values represent the percentages of minority and low-income populations within a geographic extent representing the region of influence. Areas where the AOC percentages are greater than the CoC percentages are identified as having potential EJ concerns. Typically, countywide percentages have been used for the AOC and statewide percentages for the CoC. For Florida, USEPA Region 4 has identified CoC as 31.99 percent for minority populations and 30.01 percent for low-income families (U.S. Bureau of Census, 1992).

Table 3-10. Minority/Low Income Comparisons With CoC (1990 Census)

	Minority %	Exceeds CoC %	Low-Income %	Exceeds CoC %
State of Florida CoC	31.99		30.01	
Okaloosa County	14.8	No	10.3	No
Santa Rosa County	7.8	No	14.2	No

A more specific method of evaluating EJ concerns is by looking at specific socioeconomic conditions of Eglin's surrounding communities. This targeted approach follows the general guidelines presented in the *Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP)* (U.S. Air Force, 1997b).

Geographical Information System (GIS) mapping was used to conduct targeted analyses. The AOC consisted of each individual block (minority) or block group (low-income) within the counties that are adjacent to Eglin AFB. The CoC consisted of the overall percent minority and percent low-income of the combined four counties. The resulting data was divided into four distinct categories: areas with no EJ concerns, areas with minority concerns, areas with low-income concerns, and areas with both minority and low-income concerns. Additionally, water bodies and census blocks with zero population were filtered out and identified as areas with no EJ concerns. The results are mapped in Figure 3-5. This map indicates that there are potential EJ concern areas in and adjacent to the Eglin Reservation. With reference to Santa Rosa Island, the closest EJ areas are located in Fort Walton Beach in the Camp Walton area across the Sound. The EJ areas lie inland and are buffered by high-income non-minority areas. Because of this, any impacts on these areas will be more severe to the high-income housing that sits between it and the SRI ROI.

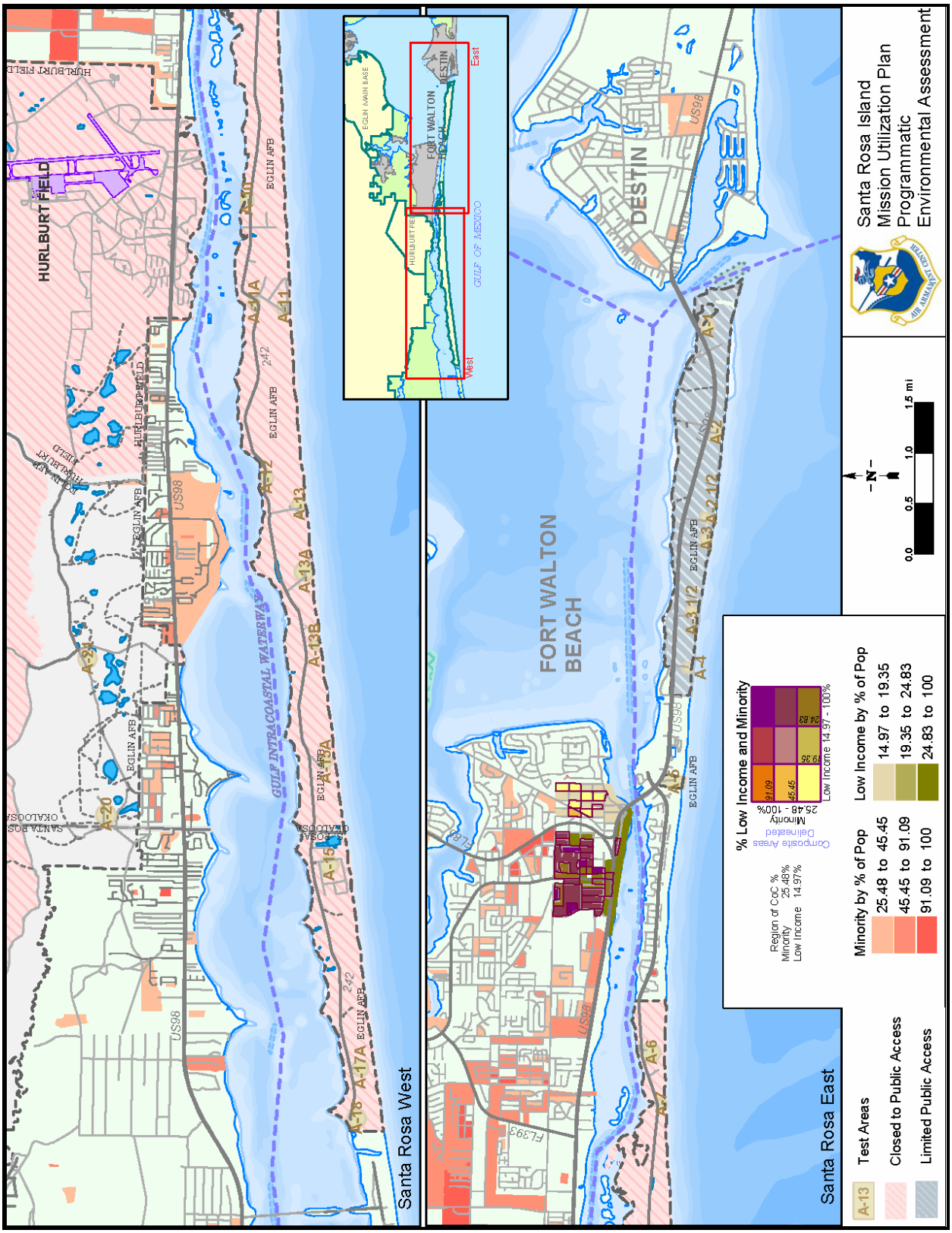

Figure 3-5. SRI Environmental Justice Concerns

3.5.4 Installation Restoration Program/Area of Concern/Radioactive Waste Sites

There are five IRP sites, seven AOCs, and three POIs on Santa Rosa Island (U.S. Air Force, 2000), which are shown in Figure 3-6.

IRP LF-22 – A-11 Disposal Site. Located near A-11, landfill operations took place during the 1960s and 1970s and consisted of hardfill, metal spools, waste oil, and empty solvent drums. Site closure consisted of covering the wastes with several feet of local sandy soil. No chemicals of potential concern (COPC) have been identified at the site. Beryllium and mercury were present in sediment samples at levels slightly above naturally occurring background levels. *Current Status*: No action taking place at site. No further action (NFA) is planned for the site.

IRP RW-42 – Low-Level Radioactive Waste Site/Drum Burial. Located on the western side of the A-15 compound, this site has limited information available for historical use. The site was used for the disposal of missile fragments, other metallic wastes, 55-gallon drums, and batteries. Additional soils have been removed and a third set of confirmatory samples was completed. *Current Status*: Results indicate the petroleum contaminants on site are below regulatory limits for residential land use. NFA has been approved for the site.

IRP SS-74 Officers' Beach Club (Compliance Funded). Site SS-74 is located on Site A-3, approximately 100 meters northeast of the former site of the Officers' Beach Club. This area is on a radar site operated by Vitro, Inc. Fuel piping was sheared from two aboveground storage tanks (ASTs) that led to the release of approximately 750 gallons of diesel fuel when Hurricane Opal passed over the site on 4 October 1995. Soil borings and monitoring wells, using the Organic Volatile Analyzer (OVA) to check soils for volatiles, and collecting soil and groundwater samples for laboratory analysis were implemented. Analyses indicated that no contamination of groundwater was present. *Current Status*: NFA was issued by FDEP on 3 December 1996.

IRP SS-76 Radar Surveillance Site (Compliance Funded). Site SS-76 is located on a remote section of Santa Rosa Island approximately 2 miles east of Navarre Bridge on Eglin Road 242. Similar to SS-74, Hurricane Opal caused a fuel pipeline to shear and moved an AST approximately 150 meters from its original location. Approximately 2,500 gallons of diesel fuel were released. Site investigations identified visible contaminants, and OVA results confirmed that the soils were excessively contaminated. A Contamination Assessment Report (CAR) was initiated in accordance with the POL Consent Agreement as accepted by the State of Florida for POL cleanup. Analyses returned all indicate that no contamination is present in groundwater monitoring wells. *Current Status*: NFA was issued by the FDEP on 3 December 1996.

IRP ST-259 Eglin Water Tower No. 12511. Site ST-259 is located in Santa Rosa County north of Range Road 242 and across the road from Building No. 12510. The site is unfenced but in an access controlled area. Water Tower No. 12511 was constructed in the 1940s. This site was assessed following the identification of contamination at other water tower sites on Eglin in early 1995. Analytical results of soil samples have detected lead in concentrations above levels of concern at these sites. On 9 February 1998, site investigation (SI) sampling of soil at Water Tower No. 12511 indicated concentrations of lead and arsenic above their respective Tier I and Tier II screening levels. Research proved that the paint used on these water towers is lead-based.

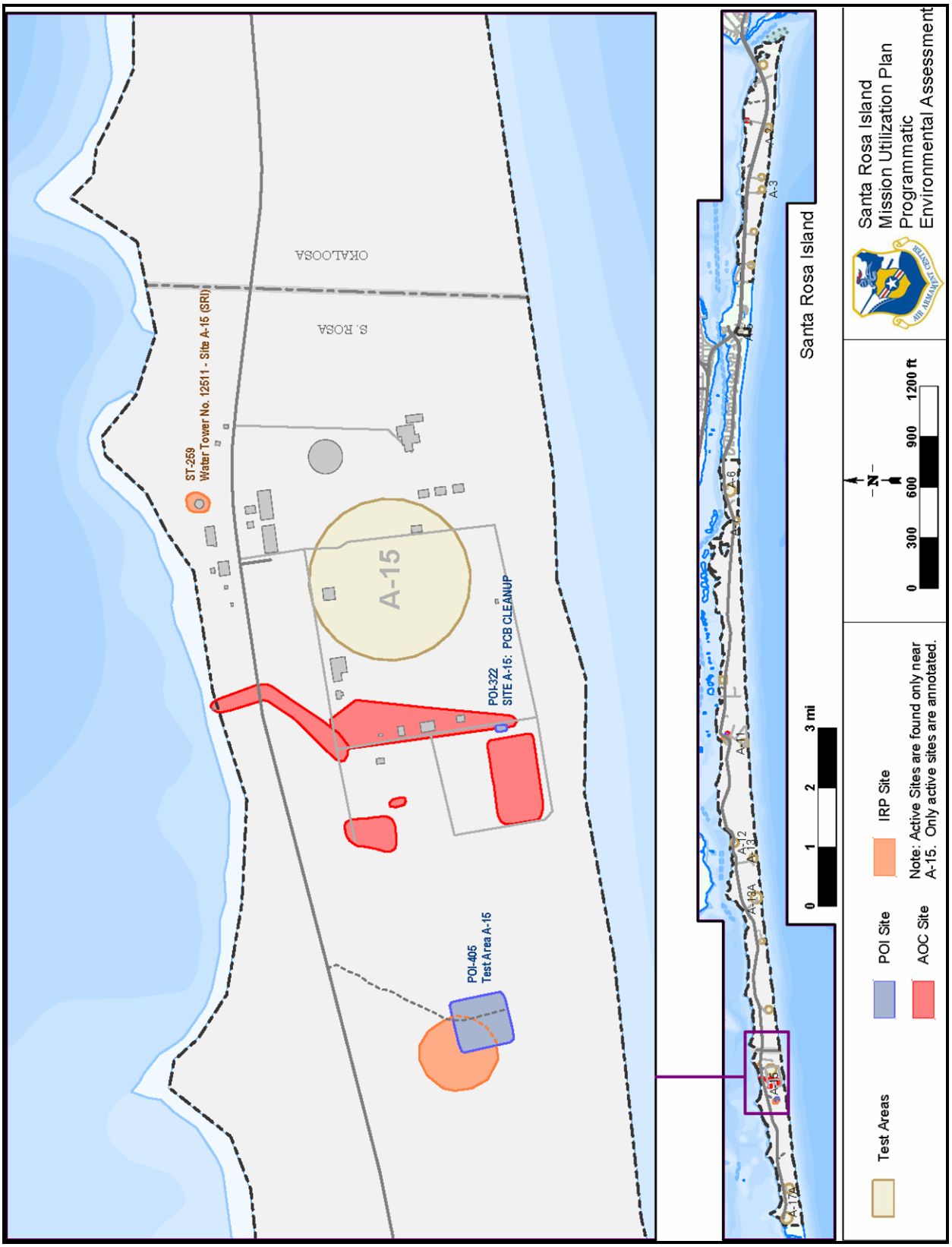

Figure 3-6. IRP Sites Associated With Santa Rosa Island

Weathering and peeling of paint will inevitably increase metal concentrations in the surrounding soil. *Current Status:* Eglin AFB stripped and repainted the tower. Interim Corrective Measures (ICM) are recommended at the site to reduce or eliminate the potential for exposure risks at the site to a level sufficient for determination of No Further Action.

AOC 2 – A-15 Former Power Plant Facility. The site is located within the A-15 Compound on Santa Rosa Island and was identified as a potential source of environmental contamination resulting from past power generation activities. The Power Plant Facility was active in the 1960s to support the BOMARC missile test program. This facility used large, aboveground diesel fuel storage tanks and belowground concrete sumps that contained oil and grease. During an SI performed in 1995, a buried pipe, possibly used as part of a fuel transfer station, was identified. The SI results indicated no soil or groundwater impacts. Therefore, NFA was recommended for the site. The building was razed and the concrete sumps were cleaned out, with material disposed of properly during the summer of 1997. *Current Status*: SI (RFA) completed June 1996. NFA approved by USEPA and FDEP on 21 August 1998. AOC file closed.

AOC 42 - VORTAC Generator Spill Site. This site is the location of an uncontrolled release of an unknown amount of fuel. The release is likely associated with a UST and emergency generator located on site. Tanks were removed in 1994. FAC Rule 17-761 site closure assessment indicated no contamination present. *Current Status*: AOC file closed.

AOC 43 – BOMARC launch facility. The site is also the location of IRP Site RW-42, which is unrelated to AOC 43. The site has been inactive since the late 1960s. Reportedly, a drain field receives discharge from building floor drains. Two hydraulic fluid reservoirs and associated pipe work and historic hydrazine and nitric acid spills are reportedly at this site. Appropriate removal actions and tank closure have been accomplished. FAC Rule 17-761 site closure assessment and groundwater data indicate no contamination present. Tanks were filled in place. *Current Status*: AOC file closed.

AOC 82 – A-15 Compound Disposal Area. The disposal area is approximately 200 feet by 200 feet and was inactive as of 1981 or earlier. It has been closed with a soil cover. The site reportedly received only hardfill materials and construction debris such as concrete, metal, wood, and wire. An SI was performed in 1995. Geophysics results identified anomalies interpreted to represent subsurface materials. SI analytical results indicated no groundwater impacts. Based on the SI results, NFA was recommended for the site. *Current Status*: SI (RFA) completed August 1996. NFA approved by USEPA and FDEP on 21 August 1998. AOC file closed.

AOC 85 – A-15 Compound Fire Training Area. This site consists of two independent structures used for fire training exercises. The primary Fire Training Area (FTA) was active from 1985 to 1987. The second area was also active in the mid-1980s and is the former location of fuel storage tanks. Fires at both locations were the result of a small quantity of liquid fuel and straw and were extinguished by water with perhaps other compounds, such as aqueous film forming foam. The results of an SI performed in 1995 indicated no groundwater or soil impacts. Based on the SI results, no further investigation and the removal of material within the sumps were recommended for the site. The sump material was removed as part of an SI addendum in August 1997. *Current Status*: SI (RFA) completed June 1996. SI Addendum completed January 1999. NFA approved by USEPA in May 1999 and FDEP in February 1999. AOC file closed.

AOC 94 – A-11 Storage Bunkers. The site consists of two storage bunkers at the A-11 Compound on Santa Rosa Island. These bunkers were identified as potential storage facilities for napalm and its constituents. Reportedly, the bunkers were constructed in the 1950s for vertical probe-sounding rocket testing. Rocket engines and solid propellants were stored in the bunkers between test missions. It was later found that napalm was not stored here. The results of an SI performed in 1995 indicated no groundwater impacts. Therefore, NFA was recommended for the site. *Current Status*: SI (RFA) completed August 1996. NFA approved by USEPA on 30 September 1998 and by FDEP on 1 September 1998. AOC file closed.

AOC 95 – Abandoned Radar Site Pipeline. The 1,000 foot long pipeline was active during the 1960s BOMARC test program and was identified by former Eglin AFB personnel as a potential source of environmental contamination as a result of diesel fuel handling. The pipeline was removed in 1990 and fuel recovery from the pipeline was necessary. Appropriate FAC 62-770 sampling was conducted. All analysis results were below detection limits. *Current Status*: AOC file closed.

AOC 111 – A-15 Compound Neutralization Site. The site consists of the former neutralization pit within the A-15 Compound on Santa Rosa Island. The pit is a 13 foot by 23 foot sump that was approximately 25 feet deep. The pit was used to neutralize acids produced in connection with the BOMARC test compound during the 1960s. A Tank Closure Report indicated no soil impacts. The results of an SI performed in 1995 indicated no groundwater impacts; therefore, NFA was recommended for the site. *Current Status*: SI (RFA) completed May 1996. NFA approved by USEPA on 21 November 1996 and by FDEP on 17 September 1996. AOC file closed.

The POI sites found on or near the Santa Rosa Island are listed below.

- POI 322 Site A-15 PCB Cleanup
- POI 356 A-11 Storage Bunkers Underground Storage Tank
- POI 369 Water Tower 12511
- POI 405 Test Area A-15
- POI 501 Former A-7 Radar Facility POL Site

POI 322 – Site A-15 PCB Cleanup. The PCB cleanup site is located at an abandoned electric substation within the A-15 Compound on Santa Rosa Island. In 1983, PCB-impacted soil and transformer oil were removed from the site. An SI was performed to confirm the removal of the impacted soils from the 1993 excavation activities. The results of an SI performed in 1998 indicated that not all of the PCB-impacted soils were removed during the 1993 excavation. In November 1998, an ICM was performed to remove the remaining PCB-impacted soils. All structures associated with the former facility (concrete storage pad and fencing) were removed during the ICM. Based on this ICM, NFA was recommended for the site. *Current Status*: SI (RFA) and ICM completed December 1998. NFA approved by USEPA on 19 December 1999. LUCIP is pending based on further evaluation per FDEP.

POI 356 – A-11 Storage Bunkers Underground Storage Tank. This POI is related to AOC 94. Cleanup has been completed in relation to AOC 94. *Current Status*: POI file closed.

POI 405 – Test Area A-15. POI No. 405 was identified as a BOMARC missile fragment disposal area. The missile debris, as well as other material, was uncovered and radioactive debris was separated and placed in approved B-25 boxes. In early 1993 the BOMARC missile debris was removed. *Current Status*: SI Work Plan was submitted in November 2000. SI fieldwork was conducted in spring 2001, and SI Report was submitted in summer 2001.

POI 501 – Former A-7 Radar Facility POL Site. Located on Santa Rosa Island, the former A-7 Radar Facility suffered extensive damage due to Hurricane Opal in October 1995. The four buildings that were the A-7 facility were demolished in June 1999. The site encompasses an area of approximately 15 feet by 15 feet and is identified by several deteriorated oil filters and yellow-brown stained soils. *Current Status*: Ongoing SI.

More information regarding the status of IRPs, AOCs, or POIs can be found in Eglin AFB's *Installation Restoration Management Action Plan*, October 2000, or by contacting the Environmental Restoration Branch of the Environmental Management Division at Eglin AFB.

3.5.5 Land Use

This section looks at land use and development and other activities occurring on and around Santa Rosa Island. The SRI ROI can be divided into three major sectors: Air Force land, municipal land, and privately held land. Eglin AFB leadership has responsibility and control of land use for its property. Similarly, local governments have similar control of the land that they manage. The remainder of the land use is influenced by a number of factors. Private land can be loosely controlled by the local government through ordinances, zoning, and other regulatory and land planning efforts, but the existing land use results mostly from the desires of individual land owners, developers, and the economic environment in which they are operating.

The anthropogenic activities on SRI ROI can be grouped into five dominant land uses. The groups represent general impacts. These land use designations do not directly relate to any specific municipality's land use planning or zoning ordinance, nor do they represent any land planning by the Air Force. Table 3-11 lists the estimated acreage of each of the dominant land activities.

Table 3-11. Santa Rosa Island Land Use

Land Use	Acres	Square Miles	Percentage of Land Use (%)
1. Controlled Access (CA)	3293	5.14	68.9
2. Beach-Public Access (BP)	989	1.55	20.7
3. High Density (HD)	346	0.54	7.2
4. Residential-Low Density (RL)	117	0.18	2.4
5. Marina/Industrial (MI)	35	0.06	0.7
Total	**4780**	**7.47**	

1. **Controlled Access (CA):** Controlled access areas are federal land under the control of Eglin Air Force Base. This land is not subject to the high traffic of public areas, but it experiences significant episodes of potential environmental impact. All activities on this land are subject to impact analysis within the regulations of the National Environmental Policy Act. CA land dominates the almost 7.5 mi^2 of the study area.

2. **Beach - Public Access (BP):** Public beaches are generally undeveloped waterfront areas, with significant pedestrian use. Beaches are major debris and trash collection points resulting from wave action, recreational use, and the proximity other high traffic commercial activity. Mechanical beach cleaning removes the threat of pedestrian debris, but it also potentially disturbs beach vegetation and subsurface sand dwelling life forms.

3. **High Density (HD):** This land use includes highrise condominiums, hotels, and apartments. It also includes shopping, restaurants, and entertainment. It is characterized by a large percentage of the property covered by impervious surfaces for parking, pool, tennis, and building areas. Limited sand and vegetated surfaces are generally manicured and only exist for aesthetic reasons. The commercial aspect of this land use drives a high maintenance effort, and therefore environmental impacts are generally predictable and measurable. If a struggling economy causes property abandonment or underutilization, impact measurability is lost.

4. **Residential Low Density (RL):** This land use is for single homes. Duplexes and multifamily rental units may fall into this category if parking does not dominate the acreage. Generally, residential impacts are minimal after construction is completed. However, residential activities normally fall below environmental regulatory thresholds, and impacts are therefore sometimes difficult to measure.

5. **Marina/Industrial (MI):** Marina and industrial land uses generally have high percentage impervious ground cover. Activities at the location require the storage and use of petroleum products, solvents, and/or other materials and wastes potentially hazardous to the environment. This land use has the greatest impact, but is also the most closely monitored and regulated.

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4. ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter analyzes the potential impacts of establishing designated usage areas for particular current and proposed mission activities (Chapter 2) on the affected environment of Santa Rosa Island (Chapter 3). Analysis will focus on quantifying potential environmental impacts to the physical (air, water, and soil), biological (plants and animals), and anthropogenic (cultural and public) resources of Santa Rosa Island. The level of mission activity described in Chapter 2 as the No Action Alternative is treated as the environmental baseline, wherein mission activities are analyzed on a case-by-case basis when AFF813 requests are made to conduct mission activities on SRI. As a result, no particular analysis is conducted on the No Action Alternative because activities are analyzed at the time of request. Therefore, this section will identify environmental issues and impacts associated with the Alternatives described in Chapter 2, which establish designated areas for conducting certain types of mission activities. Analysis focuses on these mission activities and the potential impacts to resources in that particular area's mission activity region of influence. The organization of this chapter and the environmental analysis process utilized is described below.

4.1.1 Organization

Identified Resources

The Affected Environment (Chapter 3) resources have been summarized into three general resource categories for impact analyses:

- Physical Resources
  - Air Quality
  - Soil Quality
  - Water Quality
- Biological Resources
  - Plants (includes threatened and endangered species)
  - Animals (includes threatened and endangered species)
- Anthropogenic (Human Related) Resources
  - Public
  - Cultural

Issues

An environmental consequence issue is a general category of common mission products, by-products, and/or emissions (pollutants) that may be collectively analyzed for potential impacts to the affected environment. Four broad categories of potential environmental consequence issues have been identified for the study area:

- Noise (Section 4.2)
- Direct Physical Impact (Section 4.3)
- Habitat Alteration (Section 4.4)
- Land and Water Use/Restricted Access (Section 4.5)

4.1.2 Process

Environmental Analysis

Each military activity category was associated with potential issues related to the activity. Then, for each issue category, the receptors that are potentially impacted by each issue are identified and environmental analysis is performed. The mission activities, associated issues, and potentially impacted receptors pertaining to Santa Rosa Island are listed in Table 4-1.

Table 4-1. Santa Rosa Island Mission Activities, Associated Issues, and Potentially Impacted Receptors

Mission Activity	Receptor	Issue			
		Noise	Direct Physical Impact	Habitat Alteration	Land and Water Use/ Restricted Access
No Action Alternative	Physical Resources	-	⊗	⊗	-
	Biological Resources	⊗	⊗	⊗	-
	Anthropogenic Resources	⊗	⊗	-	⊗
Alternative 1	Physical Resources	-	⊗	⊗	-
	Biological Resources	⊗	⊗	⊗	-
	Anthropogenic Resources	⊗	⊗	-	⊗
Alternative 2	Physical Resources	-	⊗	⊗	-
	Biological Resources	⊗	⊗	⊗	-
	Anthropogenic Resources	⊗	⊗	-	⊗
Alternative 3	Physical Resources	-	⊗	⊗	-
	Biological Resources	⊗	⊗	⊗	-
	Anthropogenic Resources	⊗	⊗	-	⊗

- No potential impact
⊗ Potential impact

The analysis of mission activities and their potential effects on resources associated with Santa Rosa Island produces a measure for each prescribed issue, which can be used for comparison when considering alternatives. Data from the baseline, plus selected historical activities, are used for environmental analysis. In many cases the activities being evaluated in this document have been previously analyzed and approved under previous NEPA documentation. For the environmental analysis on Santa Rosa Island, a scenario method of analysis was utilized based on these historical mission activities, with the alternatives identifying the types and locations of the activities. For a particular mission category that has been previously analyzed, the previous analysis of the mission activity is applied to the identified location. The purpose is to build upon previous analyses for evaluating current and future mission activity levels and their potential impacts.

Mission activity scenarios are developed to establish a measurement of impacts. Assumptions, based on a combination of established scientific methodologies and professional judgments, are then formulated to reflect the behavior, condition, and/or interactions of mission activities and environmental factors. Mission impacts to environmental factors are then measured based on a comparison to available threshold criteria presented in environmental regulations and scientific

literature in order to exhibit the extent of impacts. In some cases, criteria for evaluating potential impacts are unavailable. In such cases, the discussion is based on what is known in the literature about impacts related to the issue.

4.2 NOISE

Noise may be defined in terms of sound pressure level and sound frequency. Sound pressure levels (SPLs) are fluctuations in atmospheric pressure resulting from the movement of sound waves and are measured on a logarithmic scale in decibels (dB). When analyzing impacts from low frequency impulsive noise such as an explosion, peak sound pressure levels (dBP) are used to express noise intensity. Impulsive noise, resulting from munitions or weapons testing, artillery, or ground impact of high explosive warheads, is a significant fraction of the noise environment at Eglin AFB (U.S. Air Force, 1996a). Noise resulting from munitions testing and training activities (Air Force and other DoD agencies) has regularly been the source of complaints from the local community (U.S. Air Force, 1996a). For noise analysis, mission activities occurring at SRI that contribute to the noise environment consist of the following.

- Aircraft
- LCAC
- Gunnery
- Missiles
- Detonations

Noise levels from these mission activities may extend beyond reservation boundaries into communities and may impact wildlife that inhabits both Santa Rosa Island and the surrounding area. Impacts on these receptors from the aforementioned mission activities will be investigated in the following sections. The type and intensity of activity and environmental analyses of potential noise is discussed as well.

Environmental Analysis

Noise related to operations involving aircraft operations, LCAC, gunnery, missiles, and detonations associated with the alternatives was considered and compared with current conditions to assess impacts. Data developed during this process is also used to support analyses in other resource areas.

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmark referred to is 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 ". . . requisite to protect the public health and welfare with an adequate margin of safety" (USEPA, 1974). Noise may be heard, but there is no risk to public health or welfare.

- A day-night average noise level of 75 dBA is a threshold above which effects other than annoyance may occur. It is 10 to 15 dBA below levels at which hearing damage is a known risk (OSHA, 1983). However, it is also a level above which some adverse health effects cannot be categorically discounted.
- A sound pressure level (SPL) of 140 dBP has been identified by the U.S. Department of Labor, 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).
- 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.

Public annoyance is often the most common impact associated with exposure to elevated noise levels. When subjected to day-night average sound levels of 65 dBA, approximately 12 percent of persons so exposed will be "highly annoyed" by the noise. At levels below 55 dBA, the percentage of annoyance is correspondingly lower (less than 3 percent). The percentage of people annoyed by noise never drops to zero (some people are always annoyed), but at levels below 55 dBA, it is reduced enough to be essentially negligible. When subjected to day-night average sound levels of 62 dBC, approximately 15 percent of persons so exposed will be "highly annoyed" by the noise (CHABA, 1981).

The U.S. Army and U.S. Air Force have adopted a set of annoyance criteria using mathematical equations that integrate land-use guidelines with predictions of percentages of the population that would be "highly annoyed" when exposed to given day-night average sound levels. These sound levels have been categorized into "noise zones" and are shown in Table 4-2. It is desirable that Noise Zone I criteria not be exceeded.

Table 4-2. Noise Zones

Noise Zone	Noise Type/Criteria		Percent Population "Highly Annoyed"
	Transportation ADNL (L_{dn})	Impulsive CDNL (L_{dn})	
I	<65 dBA	<62 dBC	<15
II	65 – 75 dBA	62-70 dBC	15-39
III	>75 dBA	>70 dBC	>39

Source: U.S. Army, 1994; Finegold et al., 1994

Potential Receptors

Plants

No data were available concerning the impacts of noise overpressures on plants. It is estimated, however, that impacts to plants from sound overpressures may occur at 201 dBP and greater,

causing the potential rupturing of the plant cells and subsequent death of the plant. Because sound overpressures from mission activities would not reach levels greater than 201 dBP, no impacts to plants from noise are anticipated. As a result, plant species are excluded from noise impacts analysis.

Wildlife

The effects of noise on wildlife are unclear. Noise above 140 dBP may cause hearing damage in humans and could possibly have similar effects on wildlife. Although safety procedures prevent the exposure of people to such levels, wildlife within this area would be exposed. Certain management requirements that can be employed to help minimize wildlife exposure to potentially harmful noise levels are described below.

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. Therefore, those species within sight of an activity, such as a missile launch or ground troop movement, have the greatest chance of being startled. Shorebird species that are in the early stages of nest building and egg laying, and chicks in the early fledgling stages, could potentially be affected to the greatest degree since untended eggs and young could be exposed to increased predation and weather, but given the short duration of most of the mission noise sources, most birds would likely return to their nests quickly. It would be preferable to avoid known shorebird nesting and feeding areas during nesting season (1 March to 31 August) to minimize negative impacts to eggs and chicks.

No information on potential noise effects to small mammals is readily available. However, if hearing damage levels for the Santa Rosa beach mouse are assumed to be similar to those for humans, then for missions with noise levels exceeding 140 dBP, beach mouse habitat would need to be avoided. Coordination with Natural Resources Section staff would be necessary to determine current locations of the beach mouse. Reproduction peaks are in winter months, so there should be a minimization of missions near known beach mouse locations during this period. Also, because beach mice are mostly nocturnal, a minimization of nighttime missions would be preferable.

During sea turtle season, the three sensitive turtle species occurring on Santa Rosa Island (Atlantic green sea turtle, Atlantic loggerhead turtle, and Atlantic leatherback turtle) could also be annoyed by elevated sound pressure levels. Although sound pressure levels of 115 dBP would not likely reach the beach during any mission activities, some elevated levels may reach the beach area; therefore, night testing should be minimized during sea turtle season (May through October). Additionally, sea turtles and other marine/estuarine species such as dolphins and the Gulf sturgeon, may be vulnerable to underwater noise; thus noise impact analyses were conducted for these species. Because more information is available on noise thresholds for marine species, more detailed analyses were done for them under each type of mission activity. Prior to each of the missions, clearance of marine species should be conducted to minimize impacts.

Anthropogenic Resources

Residential areas, schools, hospitals, and businesses are likely locations in local communities where annoyance and property damage resulting from noise events could be a concern. For the purpose of analyzing the potential impacts of noise to the public, the population density data for

areas surrounding SRI have been incorporated into the digital analysis process (U.S. Bureau of the Census, 2000).

4.2.1 No Action Alternative

Under the No Action Alternative, the status quo would be maintained, and environmental analysis would be conducted for each mission on an as needed basis, depending on whether or not similar mission activities have been previously analyzed and approved under the Environmental Impact Analysis Process (EIAP) process. Because of the dynamic nature of the Eglin AFB test and training regime, it is difficult to anticipate the numbers and types of missions that may involve the use of SRI. Unlike the other action alternatives where a mission use plan is outlined and specific actions can be directed to specific locations, qualitative analysis can be conducted, and actions can be approved in advance given certain management requirements, by definition the No Action Alternative allows for the potential for an activity to be conducted anywhere on the Island (provided the proper analysis is conducted). Through implementation of the EIAP, each mission activity would continue to be evaluated for the qualification of a categorical exclusion based on previous NEPA documentation for similar activities or the need for further NEPA analysis prior to approval. Under the other action alternatives, requests for activities evaluated and approved would qualify for categorical exclusions provided they are conducted at designated locations and required management actions are implemented.

4.2.2 Alternative 1

Under Alternative 1, the following activities that would potentially create noise impacts and their respective dedicated locations are analyzed. Similar activities have either occurred at these locations in the past or are planned for the future and have been analyzed and approved at these locations under other NEPA and/or ESA Consultation documents (Table 4-3).

This alternative would solidify these locations as designated for these activities under one NEPA document.

Under Alternative 1, a dedicated DoD Mission Use Plan would be established qualifying the above-listed locations for the associated activities. These activities would be approved at the respective locations (provided certain management actions are implemented), and mission-by-mission analysis and approval would not be required in the future for such activities.

Under Alternative 1, the following activities or those similar would not be associated with dedicated sites, and would therefore require mission-by-mission approval as with the No Action Alternative.

- Surf zone testing and training
- Small boat obscurant testing
- Live fire activities
- Expanded Special Operations training
- Amphibious assaults
- Expanded LCAC operations

Table 4-3. Alternative 1 Noise-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation for Similar/Related Actions
	Live	Inert		
Current				
S/A Missile Testing	Y		TA A-15,	Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement-Eglin Gulf Test Range (U.S. Air Force, 1998e), Environmental Assessment for Projected PATRIOT Testing (5-Year Plan) (U.S. Air Force, 2002) and Biological Assessment (U.S. Air Force, 2002a)
OA-HITL Testing	N/A		HITL Tower (TS A-13B) & Focus Sites (TS A-3, TS A-6, TS A-17A)	Santa Rosa Island Reconstitution Test Capabilities Environmental Assessment (U.S. Air Force, 1998a), Overland Air Operations Final Programmatic Environmental Assessment (U.S. Air Force, 1998)
Ground Testing	Y		TA A-15	Littoral Assessment of Mine Burial Signatures (LAMBS) Biological Assessment (U.S. Air Force, 2002a) Joint Biological Point Detection System (JBPDS) at Multiple Test Ranges Ecological Assessment (U.S. Air Force, 2003b) Airborne Littoral Reconnaissance Technologies (ALRT) Project (U.S. Air Force, 2004a)
Personnel/Equipment Drops & Extractions	N/A		Throughout Surf Zone	Overland Air Operations Final Programmatic Environmental Assessment (U.S. Air Force, 1998); Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c) U.S. Army Ranger Los Banos Training Biological Opinion (U.S. Air Force, 2003d) Advanced Skills Training Program Biological Assessment (U.S. Air Force, 2003e)
LCAC Crossings	N/A		~TA A-13B	Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c) Landing Craft Air Cushion (LCAC)/Gun Pod Unit-5 (GPU-5) Integration Demonstration Environmental Assessment (U.S. Air Force, 1998b)
Future				
Expanded OA-HITL Tower Testing	N/A		HITL Tower (TS A-13B) and Focus Sites (TS A-3, TS A-6, TS A-17A)	Santa Rosa Island Reconstitution Test Capabilities Environmental Assessment (U.S. Air Force, 1998a)

Requests for similar activities would be evaluated through the EIAP process on a case-by-case basis and appropriate environmental management actions (i.e., consultations, permits, etc.) would be implemented if deemed necessary.

Electronic Systems/ECM Testing/Training occurring under Alternative 1 are not likely to create any noise impacts to the public or biological resources:

Aircraft Noise

Noise from crossover flights will not be discussed here. The *Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force, 1998) addresses potential impacts associated with the noise resulting from SRI crossover flights through established air corridors. Aircraft noise associated with OA-HITL Tower testing is addressed later in this section.

Helicopter Noise

Helicopter noise would be most noticeable to persons on shore or in near-shore Gulf waters during personnel/equipment drops and extractions. Personnel/equipment drops occurring in the Sound are addressed in the *Estuarine and Riverine Areas Programmatic Environmental Assessment* (U.S. Air Force, 2003h). The sound exposure levels in Table 4-4 for an HH-53 represent typical noise that would be produced at the drop zones and landing zones out to several distances. It should be noted that during hot weather, helicopters require more energy to stay aloft, and produce more noise as a result, but humidity may have a dampening effect on sound. Cold weather may cause sound to travel farther than it would during warm weather.

Table 4-4. HH-53 Sound Exposure Levels

Distance (feet)	Sound Exposure Level[1]
200	**101.4**
250	99.9
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
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

[1]dBA based on 100 percent RPM, at 59 °F, 70 percent relative humidity
Source: U.S. Air Force, 1996a

Potential Noise Impacts to the Public

At a distance of 500 feet, noise would not exceed 95 ASEL. No single noise exposure from low-level helicopter operations should result in annoyance to the public, given that the distance between the Island and the mainland shoreline exceeds 1,000 feet. As a result, the public would

not be exposed to noise greater than 95 ASEL from helicopters at landing zones on SRI. Other vessels should not be exposed to noise of 95 ASEL since training is not conducted until the drop zone and surrounding areas are clear of nonparticipating vessels and aircraft.

Potential Noise Impacts to Biological Resources

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* (U.S. Air Force, 2003a and for U.S. Army Ranger Los Banos training (U.S Air Force, 2003d). A summary of these impacts is provided below.

Sea Turtles:

Brief helicopter landings (less than five minutes) occur about once a month during Ranger training to pick up personnel at two designated landing zones (PZ NYE or PZ OPUS). Low-altitude helicopter operations during which troops or equipment are deployed are relatively short in duration (less than five minutes), and helicopters usually hover at an altitude of less than 100 feet. The probability that a nesting female would attempt to enter the beach within a 0.5 mile of these activities is very low, even during peak nesting periods. During nesting season, the peak rate for loggerheads is 0.012 nests per night per 0.5 mile and the peak rate for green turtles is 0.007 nests per night per 0.5 mile, for a total potential peak of 0.019 nests per night per 0.5 mile.

If noise from helicopter operations was audible and sufficiently intense along an entire 0.5 mile section of beach front for an entire night during peak nesting season, the number of nesting deterrences would be estimated by adding the peak nesting rate for loggerhead and green turtles and multiplying that sum by the number of exercises occurring during that nesting season. For example, if 100 missions were flown, all at night over the peak nesting period, less than two deterrence episodes are likely to occur.

During a year when green sea turtles are not nesting on SRI, the number of possible nests deterred during the peak nesting period would be less. If any or all of these activities occur outside of the peak nesting periods, the rate of deterrence would be further reduced.

Piping Plover/Shorebirds: 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 result in a potential increased 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. Even so, 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 (1 March to 31 August).

OA-HITL Tower Aircraft Traffic Noise

Only noise from military aircraft passing within 100 feet of and as low as 200 feet above the ground near OA-HITL tower was considered in the *Final Environmental Assessment for Santa Rosa Island Reconstitution Test Capabilities* (U.S. Air Force, 1998a), which is the basis for the information presented in this section. Noise modeling analyses (Table 4-5) shows that east-west flight profiles passing OA-HITL tower (at site A-13*/A-14*) would have no significant noise

impacts on residential areas to the north of Santa Rosa Sound or on recreation lands to the west of Eglin AFB-controlled lands on SRI, but that north-south profiles may require operational constraints. A single aircraft south to north level overflight of the OA-HITL tower produces a ground noise level up to 115 dBA SEL, with an equivalent L_{dn} of 65.6 over existing residential areas north of Santa Rosa Sound. These potential noise impacts can be mitigated through the use of certain flight maneuvers, which have been shown to reduce single event aircraft noise by 10 to 12 dBA and that, with the use of these maneuvers, the 95 dBA SEL (threshold) will fall short of, or barely touch, the north shore (U.S. Air Force, 1998).

Table 4-5. 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-15 Air-to-Ground dB SEL	99.9	73	59

* SEL values have been rounded to whole decibels.
(Table from U.S. Air Force, 1998)

Potential Noise Impacts to the Public

At the western property line, 20 east to west aircraft overflights in a day, each producing a ground level noise value of less than 90 dBA SEL, would yield an L_{dn} of less than 53 dB. At the north shore of Santa Rosa Sound, 20 east to west aircraft flights in a day, each producing a ground level noise value of 95 dBA SEL, would yield an L_{dn} of 58.6 dBA (U.S. Air Force, 1998). These levels are such that no change would be required in the aircraft flight profile.

At some points nearest the tower, the SRI background noise level of 41 to 60 dBA would be increased. Dependent on the number of missions flown per day, the background noise could go up to an estimated 78 dBA (for 20 missions/day), 76 dBA (for 10 missions/day), or 67 dBA (for 1 mission/day) (U.S. Air Force, 1998). These are the loudest possible noise levels which could result from the aircraft missions, and they would not be present at all points on the Island. As a result, expanded operations at this site would not present any significant noise impacts to the public.

Potential Noise Impacts to Biological Resources

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. As mentioned previously, the duration of these events would be short-term, and shorebirds would likely return to nesting sites rather quickly. There would potentially be 1.6 sea turtle nests within 0.5 mile of the tower. As a result, operations at night during the months in which sea turtles nest (May through August) may result in the deterrence and subsequent prevention of 1.6 nests within 0.5 mile of the tower. Reduced night operations during nesting season are recommended to minimize potential impacts to nesting sea turtles.

LCAC Noise

Analysis of LCAC noise in this document assesses the potential for LCAC use on SRI proper and in the surf zone of the Gulf of Mexico to impact the public and/or biological resources. Potential noise impacts 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, 2003h) and are not addressed in this document. Under Alternative 1, an established LCAC crossover point would be designated at TA A-13B (Figure 2-1, in Chapter 2). The effects of noise associated with LCAC crossings at this location as well as LCAC use in the Gulf were evaluated in the *ARG/MEU Environmental Assessment* (U.S. Air Force, 2003). The following is a summary of this analysis, which is directly applicable because the only approved crossover site for Alternative 1 would be at TA A-13B, which is the location that was analyzed for the ARG/MEU.

There are no detailed noise curve data available for LCAC operations. However, based on the Air Force's Acoustic Effects Branch (AL/OBEN) Excess Sound Attenuation Model for the LCAC's engines under ground runup conditions, some sound data are available. Data estimate that 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 a point less than 400 feet from the craft (Table 4-6) (U.S. Air Force, 1999).

Table 4-6. 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, 1999
Note: Measures represent estimates during LCAC operation.

To estimate noise exposure from the LCAC in transit, it was considered as a noise source moving laterally in front of a receptor positioned at 300 feet perpendicular to the track of the craft. The craft was estimated to be traveling at a speed of 40 knots along this track. Considering available noise level data, the sound exposure level (SEL) at the receptor was calculated for the total noise event, which was estimated to last approximately 16 seconds. 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. Noise contours associated with the LCAC at the crossover point are shown in Figure 4-1.

Potential Noise Impacts to the Public

At a distance of 400 feet, noise would not exceed 95 ASEL. No single noise exposure from LCAC operations on SRI should result in annoyance to the public, given that the distance between the Island and the mainland shoreline exceeds 1,000 feet.

Potential Noise Impacts to Biological Resources

Sea Turtles: Potential impacts to sea turtles are associated with noise impacts from LCAC use on both land and water, resulting in harassment and adverse effects to nesting abilities. A recent informal ESA Section 7 consultation with the National Marine Fisheries Service (NMFS) for ARG/MEU training in the Gulf of Mexico estimated that during sea turtle season approximately 1.6 sea turtles, including hatchlings, would be present in any given square mile, with only about 0.5 turtles present at the surface (U.S. Air Force, 2003). Realistically, any effects from the LCAC would be limited to turtles at the surface, including hatchlings.

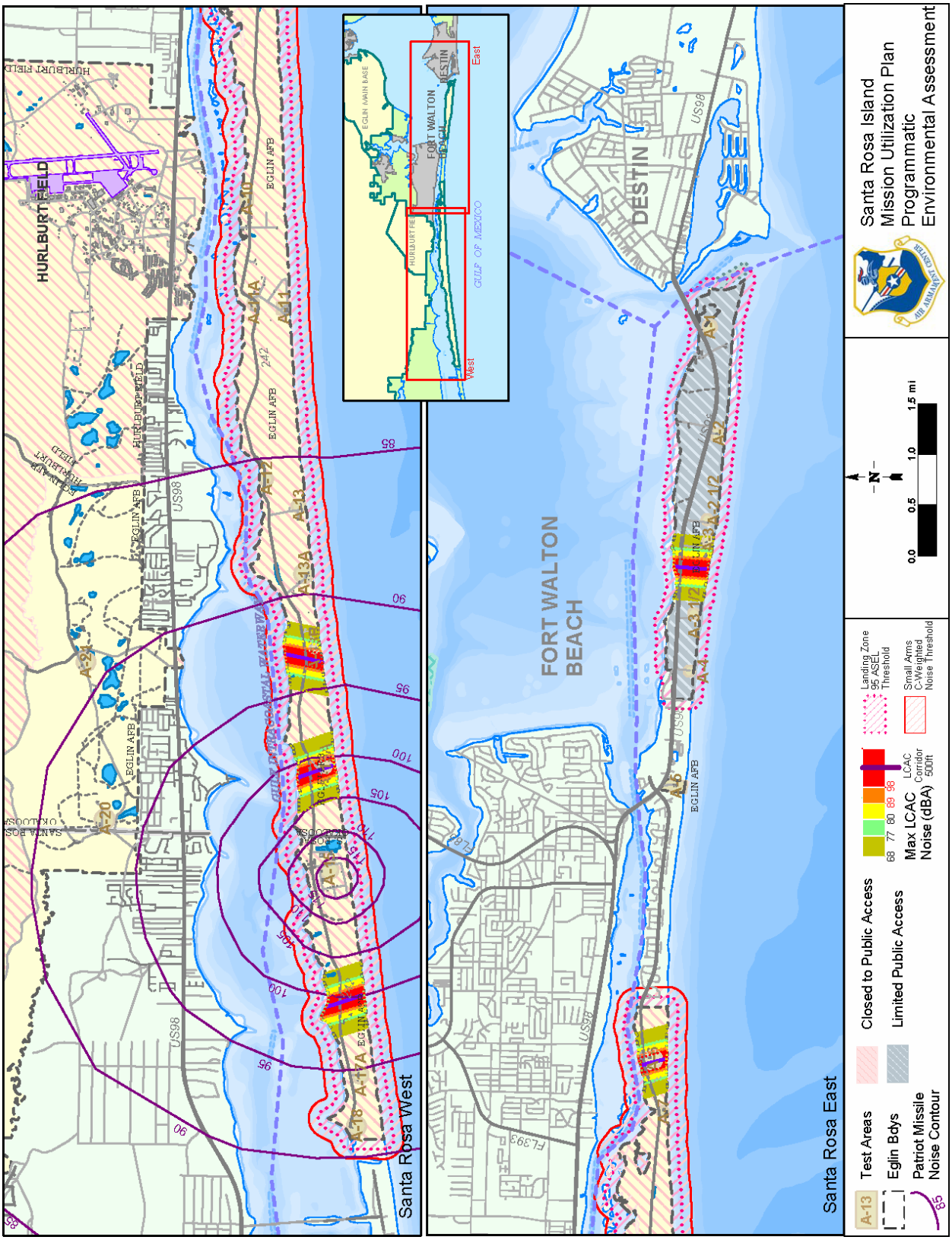

Figure 4-1. Surface Noise Profiles Associated With Mission Activities Under All Alternatives

LCAC use on land in the 7-mile training corridor was assessed in the USFWS ESA Section 7 Consultation for ARG/MEU training (U.S. Air Force, 2003a), 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 centrifugal fans and gas turbine engines, as well as the general disturbance caused by a craft of this size (88 feet long and 47 feet wide), 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 and Critical Habitat: The only documented sighting of a piping plover occurred on the north side of the Island within designated critical habitat. This critical habitat area is more than 3 miles west of the LCAC crossover corridor at A-13B. Therefore, LCAC crossovers at either the north or south shore within this corridor are not expected to pose a threat to the species. However, due to the complexity of plover habitat usage patterns, the presence of piping plovers in the crossover area cannot be ruled out. It is likely that noise from LCAC operations would only serve to flush the bird from the landing and crossing area, possibly causing stress and extra caloric expenditure. The disturbance generated by sustained LCAC operations at A-13B would be sufficient to keep piping plovers from foraging in the landing area during the course of the operation. During this time, displaced plovers may simply move on to undisturbed foraging areas.

Shorebirds: The closest documented occurrence of least tern and black skimmer nesting is situated approximately 1.5 miles west of the crossover area. However, snowy plovers are solitary nesters and could nest anywhere along the rack line or other suitable habitat along the beach, which includes the proposed LCAC crossover location. Thus, while nesting colonies or individual nests of these three species have not been documented within the proposed crossover area, they have the potential to occur within the corridor. As a result, any activity that occurs on Santa Rosa Island within the breeding seasons of these birds has the potential to impact reproductive success.

Wading Birds: State listed wading birds such as the snowy egret, little blue heron, tricolored heron, and white ibis, which are designated as species of special concern by the Florida Fish and Wildlife Conservation Commission, would be minimally impacted primarily from temporary displacement from foraging areas, such as the wetland areas within the A-13 crossover corridor or along shorelines of saltwater and freshwater water bodies.

Santa Rosa Beach Mouse: 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 Santa Rosa Island, beach mice should not be significantly impacted by noise from LCAC crossings along TA A-13B, as this corridor is essentially void of dunes. Eglin AFB Natural Resources Section conducts quarterly track count surveys in the vicinity of the proposed action area. Data from these surveys are expected to indicate any substantial change in beach mouse populations on SRI.

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

S/A Missile Noise

Noise impacts associated with S/A missile testing have been evaluated in the *Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement—Eglin Gulf Test Range* (U.S. Air Force 1998e), Final Environmental Assessment for Projected PATRIOT Testing (5-Year Plan) (U.S. Air Force, 2002), and the Biological Assessment for Projected PATRIOT Testing (U.S. Air Force, 2002f). The primary noise impact from the PATRIOT missile is the subsonic noise that results from launch and overflight of the missiles. This noise has the potential to impact personnel and structures in the launch areas. Therefore, impacts were evaluated with respect to changes that would occur in the access and use of adjacent properties, by both the military and the public, due to these potentially high noise levels and the associated area closures. Noise overpressure levels of 140 dBP (0.029 psi) and 115 dBP (0.002 psi) are the standards used for human hearing protection requirements and annoyance to the public, respectively. A launch will generate impulse noise of 145 dBC (170 dBP) at a distance of 800 feet from the rear of the missile (U.S. Army, 1990). Closures in the safety footprint would be temporary (less than four hours), and would be imposed to protect the public from exposure to potentially harmful levels of blast pressure and noise. Noise profiles associated with S/A missile testing are shown in Figure 4-1.

Potential Noise Impacts to the Public

TA A-15 is closed to public access from the mean high tide of the Gulf of Mexico landward. This area is well beyond the reach of the 115 dBP sound pressure level (U.S. Air Force, 2002). As a result, access restrictions to the public would remain as baseline, and it would be highly unlikely that any civilians would be exposed to potentially harmful noise and damaging blast pressure levels.

Potential Noise Impacts to Biological Resources

For wildlife within a 0.2-mile distance of the launch, there would likely be an exposure to a short duration (11 seconds) of a maximum noise level greater than 115 dBC (U.S. Air Force, 2002). 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 (May to 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 (U.S. Air Force, 1998).

4.2.3 Alternative 2

Alternative 2 includes the activities proposed in Alternative 1 plus the establishment of Surf Zone Test Areas (SZTAs) on SRI to support major surf zone test exercises and small boat obscurant testing. For analysis purposes, the following activities listed in Table 4-7 have the potential to create noise impacts.

Table 4-7. Alternative 2 Additional Noise-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation for Similar/Related Actions
	Live	Inert		
Designated Surf Zone Testing/Training Areas	Y		TA A-15, TA A-10, ~TA A-2	Final Environmental Assessment for Coastal Testing of the Shallow Water Assault Breaching (SABRE) and Distributed Explosive Technology (DET) Systems, January 1999 (U.S. Air Force, 1999) Final Environmental Assessment for Testing of the MK-82 General Purpose Bombs and MK-5 Mine Clearance System, January 1999 (U.S. Air Force, 1999a) Letter of Authorization for the Incidental Harassment of Marine Mammals from Surf Zone Testing Missions at Eglin AFB, FL, July 1998 (U.S. Air Force, 1998d) Naval Explosive Ordnance Disposal School Training Operations Biological Assessment (U.S. Air Force, 2004)
Small Boat Obscurant Testing	N/A			None

Impacts associated with Alternative 1 are described in the Alternative 1 analysis section. For Alternative 2, concentrating surf zone detonation activities within certain zones may reduce the environmental impacts associated with these activities as well as standardize the logistics of surf zone detonations and operations planning. These SZTAs would be established with published usage guidelines similar to the numerous test areas described in the *AAC Technical Facilities Manual, Volume II, Land Test Areas* (U.S. Air Force, 1996). These test area descriptions would include limitations, restrictions, mitigations, facilities, and instrumentation. Representative surf zone tests of various net explosive weights are provided in the analysis that follows. The frequency of testing of large mine clearance systems would be variable. Historically, no more than three of these tests have occurred within a year's timeframe and some years have had no tests of this type.

Noise from Small Boat Obscurant Testing

This activity would involve the use of obscurants along the shoreline to mask small boats (<50 feet) during beach landings or reconnaissance missions. No harmful levels of noise would be associated with the use of small boats during these activities. However, noise associated with small boat use may become 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.

Detonation Noise

Detonation noise impacts are considered within two categories, overpressure, and acoustics. Explosive detonations produce a wave of pressure in the atmosphere and, correspondingly, in the water column for underwater detonations. This pressure wave potentially has lethal and injurious impacts, depending on the receptor and the proximity to the source detonation. Humans and animals receive the acoustic signature of noise as sound. Beyond the physical impacts, acoustics may cause annoyance and behavior modifications (Goertner, 1982). Both of these aspects of noise will be investigated in the following analysis.

Above-Water/On-Land Noise Impacts

The above-water and on-land noise from the proposed detonation tests has not been modeled in previous environmental assessments. Underwater measurements were obtained for the MK5 line charge when this test was performed; however, land noise measurements were not taken. The safe standoff distance, which is the area outside of 140 dBP, was calculated to be 7,479 feet for the MK5 MCS at 1,761 pounds of composition C-4 detonated in open-air on flat terrain. The nearest residential area is on the north shore of Santa Rosa Sound approximately 7,500 feet north of Test Site (TS) A-15. Detonation of the explosive under water, along with the height of SRI (11 feet above mean sea level), attenuates this noise level. Public areas outside of the Air Force property are well outside of the 140-dBP safety limit. It is therefore unlikely that these noise events will impact terrestrial wildlife, public tourism, recreational activity, or residential areas in the vicinity.

Underwater Noise Impacts

Potential Noise Impacts on Underwater Biological Resources

Fish: The underwater pressure wave, or shock wave, resulting from detonations is potentially lethal to fish as it may result in the rupture of the swim bladder, which is an air cavity upon which fish are physiologically dependent. Damage to the swim bladder may occur from the peak pressure of the shock wave or the negative pressure wave produced by the detonation. Ruptures may also occur in the spleen, kidney, liver, gonads, or blood vessels (Wright, 1982; Linton et al., 1985). An increase in fish size is negatively correlated with the lethal distance from the source of explosion, so that smaller fish are more susceptible to impacts at larger ranges. O'Keefe and Young (1984) report that a one-ounce fish may be killed up to several hundred feet from the detonation of 70 pounds of explosive in 10 feet of water.

The impacts to fish populations from the described detonations in baseline operations would be minimal since few detonations would occur over the course of a year. Individual schools could be affected but exact numbers cannot be calculated since density information is not available for fish in general. The activity of setting up the testing operations (i.e., boat activity, launching of line charge and DET net, movement of personnel on beach and in water) should cause fish to migrate outside of the immediate vicinity. Any impacts to fish would likely be to the smaller sized fish. Significant impacts to fish populations are not anticipated. The amount of explosive material in one M-5 line charge, 1,750 pounds NEW, is the greatest amount of explosive per test among all proposed tests (SABRE $\leq$ 232 lbs NEW/test; DET $\leq$ 130 lbs NEW/test, MK-82 = 1,372 lbs NEW/test), and observations following this test in March 1999 did not note any dead fish surfacing or washing on shore the following day.

Negative impacts to widely distributed fish are not anticipated on a community or population level. However, injuries or mortality to a threatened species such as the Gulf sturgeon may impact the population and survival of that species. The potential impact to the Gulf sturgeon is further discussed under Threatened and Endangered Species.

Marine Mammals and Sea Turtles: Estimating the impacts to marine mammals and sea turtles from underwater detonations is difficult due to complexities of physics of explosive sound under water and the lack of understanding with respect to hearing in marine mammals and sea turtles. Potential impacts from surf zone detonations at Santa Rosa Island on marine mammals and sea turtles were previously analyzed in the documents listed in Table 4-7.

These assessments use criteria and thresholds for impact that were agreed upon in a joint technical meeting between the U.S. Air Force and the Navy held at Eglin AFB in October 1997. However, new information and scientific analysis have led to revisions in these thresholds and criteria, and these updates are reflected in the analysis in this section.

Noise impact criteria and thresholds used in this updated analysis are based on analysis from the SEAWOLF Submarine Shock Test Final Environmental Impact Statement (FEIS) and the USS WINSTON S. CHURCHILL (DDG-81) Ship Shock FEIS (DoN, 1998 and DoN, 2001, respectively). The criteria and thresholds used in these documents were adopted by the National Marine Fisheries Service (NMFS) in its Final Rule on the unintentional taking of marine animals incidental to the shock testing (Federal Register, 2001).

Criteria for assessing impacts include mortality (i.e., death) as determined by exposure to a certain level of positive impulse pressure (expressed as pounds per square inch per millisecond or psi-msec); injury, both hearing related and non-hearing related; harassment, as determined by temporary loss of hearing ability and by behavioral reactions. Permanent hearing loss is considered an injury and is defined as a permanent threshold shift (PTS). PTS is also a type of harassment categorized as Level A by NOAA Fisheries.

Temporary loss of hearing ability is also stated as temporary threshold shift (TTS), meaning a downward but recoverable decrease in hearing sensitivity. TTS is categorized as a Level B harassment and is considered here as non-injurious. NOAA Fisheries recognizes a dual criterion for TTS, one based on peak pressure and one based on 1/3 energy flux density level (EFDL) with the more conservative (i.e., larger) of the two being selected for impacts analysis.

The thresholds, which are specified levels of noise that result in mortality, injury, or harassment, and which are expressed in terms of the above metrics, are listed below in Table 4-8. Mortality and injury thresholds are designed to be conservative by considering the impacts that would occur to the most sensitive life stage (e.g., a dolphin calf). Though some of the thresholds were specifically designed to address impacts to cetaceans, NMFS has endorsed their use for sea turtles in previous environmental analysis documents.

Table 4-8. Criteria and Thresholds for Impact of Explosive Noise on Marine Mammals and Sea Turtles

Criterion	Criterion Definition	Threshold
Mortality	Extensive lung damage (1% of dolphin calves exposed would be killed)	30.5 psi-msec positive impulse
Injury (Non-Hearing Related)	Onset of slight lung injury for size of dolphin calf (i.e., an animal weighing less than 174 kg)	13 psi-msec positive impulse
Level A Harassment Auditory Injury	(50% of animals exposed would experience ear drum rupture, resulting in estimated 30% PTS)	205 dB Total EFDL
Level B Harassment	Temporary Threshold Shift (NMFS dual criterion)	12 psi peak pressure
Level B Harassment	Temporary Threshold Shift (NMFS dual criterion)	182 dB 1/3 Octave band EFDL
Level B Harassment	"Sub-TTS" behavioral disruption (Level B under MMPA; harassment under ESA)	177 dB 1/3 Octave band EFDL

Impact Areas

Impact areas are derived from mathematical calculations and models that predict the distances to which threshold noise levels would travel. The equations for the models consider the amount of net explosive, the properties of detonations under water, and environmental factors such as depth of the explosion, overall water depth, water temperature, and bottom type.

The end result of the analysis is an area known as the Zone of Influence (ZOI). A ZOI is based on an outward radius distance (e.g., in meters) from the point of detonation of noise of a particular threshold level. Thus, there are separate ZOIs for mortality, injury (hearing-related injury and slight (not fatal) lung injury), and harassment (TTS and behavior). Given the radius, and assuming noise spreads outward in a spherical manner, the entire area ensonified (i.e., exposed to the specific noise level being analyzed) is estimated. Though shallow water mine clearing systems are comprised of lines or multiple blocks of explosive and would typically produce non-spherical zones of influence, all net explosive weight in the systems analyzed in this section was totaled and a single point of detonation assumed for each system. This approach provides a simplified but conservative analysis.

The ZOI radius in meters for four shallow water surf zone mine clearing systems is provided in Table 4-9 below.

Table 4-9. Zones of Influence for Underwater Explosive Noise Produced from Four Mine Clearing Systems

Threshold	Criteria	ZOI (METERS)			
		SABRE 232 lb NEW	MK-5 MCS 1750 lb NEW	DET 130 lb	MK-82 ARRAY 1372 lb
1/3 Octave 177 dB EFDL	Level B Behavior	1440	2299	1252	2207
1/3 Octave 182 dB EFDL	Level B TTS Dual Criterion	961	1658	796	1544
205 dB EFDL	Level A PTS	200	478	155	436
12 psi	Level B Dual Criterion	1501	3771	1250	3756
13 psi-msec	Level A Injury	60	100	58	86
30.5 psi-msec	Mortality	45	68	42	60

Take Estimates

The metric used in virtually all (Navy, Air Force, USGS, MMS, seismic industry) risk assessments for counting marine mammal injuries and applying for permits is the statistical *expected value of the number of animals taken for each species.* "Taken" here means being exposed to sound levels in excess of the threshold.

The number of takes is calculated by applying known densities of protected species to the ZOIs for each alternative. Species densities for sea turtles and most cetaceans are based on GulfCet II aerial survey data, which are provided in Tables 4-10 and 4-11 below. GulfCet II aerial survey data were conservatively adjusted upward to two standard deviations to obtain 99 percent confidence, and a submergence correction factor was applied to account for the fact that surface surveys do not account for the presence of submerged animals. The GulfCet II surveys were conducted from 1996 to 1998 and provide densities of cetacean and sea turtles species for the continental shelf and slope.

Table 4-10. Cetacean Densities for Gulf of Mexico Shelf Region

Species	Individuals/ 100 km^2	Individuals/km^2	Dive profile - % at surface	Adjusted density (Individuals/km^2)[a]
Bottlenose dolphin	14.798	0.148	30	0.810
Atlantic spotted dolphin	8.890	0.089	30	0.677
T. truncatus/S. frontalis	0.665	0.007	30	0.053
Totals	**24.353**	**0.244**		**1.54**

[a]Adjusted for undetected submerged animals to two standard deviations.

Table 4-11. Sea Turtle Densities for Gulf of Mexico Shelf Region

Species	Individuals/ 100 km^2	Individuals/km^2	Dive profile - % at surface	Adjusted density (Individuals/km^2)[a]
Loggerhead	4.077	0.041	10	0.617
Kemp's ridley	0.097	0.001	10	0.038
Leatherback	0.327	0.003	10	0.081
Unidentified chelonid	0.340	0.003	10	0.073
Totals	**4.841**	**0.048**		**0.809**

[a]Adjusted for undetected submerged animals to two standard deviations.

Table 4-12 indicates the take estimates that were associated with potential Alternative 2 noise impacts to dolphins and sea turtles.

Table 4-12. Alternative 2 Take Estimates from Noise Impacts to Dolphins and Sea Turtles

Threshold	Criteria	SABRE		MK-5 MCS		DET		MK-82 Array		TOTAL Takes	
		Cetaceans	*Sea Turtles*	*Cetaceans*	*Sea Turtles*	*Cetaceans*	*Sea Turtles*	*Cetaceans*	*Sea Turtles*	*Cetaceans*	*Sea Turtles*
177 dB 1/3 Octave EFDL	Level B Harassment Sub-TTS	10	6	25	14	7	4	21	12	**63**	**36**
182 dB 1/3 Octave EFDL	Level B Harassment TTS (dual criterion)	5	3	13	7	3	2	11	6	**32**	**18**
12 psi	Level B TTS (dual criterion)	10	0	68	38	6	4	67	38	**151**	**80**
205 dB Total EFDL	Level A PTS	0	0	1	1	0	0	1	1	**2**	**2**
13 psi-msec	Level A Non-lethal Injury	0	0	0	0	0	0	0	0	**0**	**0**
30.5 psi-msec	Mortality	0	0	0	0	0	0	0	0	**0**	**0**

Potential impacts to marine mammals and sea turtles from these tests were presented to the National Marine Fisheries Service (NMFS) in requesting a Letter of Authorization (LOA) for conducting the described surf zone activities off of SRI (U.S. Air Force, 1998d). The MK-82, M5 Line Charge, SABRE, and DET Mine Countermeasure tests were permitted by NMFS if certain management actions to avoid impacts to marine mammals and sea turtles were conducted prior to and during the testing. Although it would be necessary to apply for another permit prior to any

future surf zone testing, the requirements in the expired LOA provide good guidance for impact minimization measures that could be employed during surf zone testing:

- Testing would be conducted between 1 November and 1 March to ensure that nesting shorebirds, nesting marine turtles, calving dolphins, and West Indian manatees are avoided.
- Testing would only be conducted under daylight conditions of suitable visibility and sea state.
- Thirty-minute pre-mission aerial overflights of the Gulf target and adjacent areas, with Eglin Natural Resources Section (96 CEG/CEVSN) personnel onboard as observers, would be conducted. If protected marine species were observed within the target or closely adjacent areas, testing would be delayed until the area was certified clear.
- Thirty-minute post-mission aerial surveys would be conducted to search for any marine species potentially injured or killed.
- If any impact to marine species occurred beyond what has been considered, operations would immediately cease and the appropriate regulatory agency would be notified.

Although the estimated number of takes in Table 4-12 is large, with the implementation of the management actions above and those listed in the Management Recommendations section below, the potential for impacts to marine mammals and sea turtles is greatly reduced. With avoidance and minimization procedures in place, surf zone detonation impacts to marine mammals and sea turtles are anticipated to be minimal.

The additional test described under baseline conditions that was not analyzed within the environmental assessments for the MK-82, M5 Line Charge, SABRE and DET Mine Countermeasure tests was the Pentolite test. The Pentolite test was conducted as a preliminary event to provide acoustic signature data in preparation for the SABRE testing event. The largest Pentolite charge used during the test was one 10-pound charge. The impacts on marine mammals are not significantly increased in relation to the Mine Countermeasures tests described above. Management requirements established for the Pentolite test are similar to those described above and have minimal impacts on marine mammals and sea turtles.

Gulf Sturgeon: The proposed testing in Alternative 2 may impact the Gulf sturgeon, a federally threatened species that migrates into the Gulf of Mexico during the winter months. Little is known about the movements and distribution of the Gulf sturgeon in the offshore waters of SRI, but waters within 1 mile of SRI have been designated as critical habitat for the sturgeon, indicating that they may use habitats in this area. The environmental assessments that analyzed impacts from the testing calculated the area around the detonations that would impart 50 percent mortality, 1 percent mortality, and injury for any Gulf sturgeon that were in the area (Table 4-13). The calculations were derived from the Yelverton-Hill model with the assumption that the sturgeon weight was 10 kilograms, since 10 kilograms is the upper limit of data presented for the model (U.S. Air Force, 1999).

Table 4-13. Areas of Mortality and Injury for the Gulf Sturgeon for Baseline Conditions

	Area of 50% mortality	Area of 1% mortality	Area of Injury
MK5 MCS, different orientations	0.01 km^2	0.01 – 0.067 km^2	0.038 – 0.587 km^2
MK-82 GPBs, matrix configuration	0.085 km^2	0.298 km^2	1.298 km^2

*Distribution or densities of Gulf sturgeon in surf zone waters not known.

Gulf sturgeon may be lethally injured during the tests proposed in the baseline. Since this is a threatened species, potential takes may impact the stocks of the Choctawhatchee River, Yellow River, or other Gulf of Mexico rivers. Because visual monitoring before testing is unlikely to detect sturgeon unless they are in shallow, clear water, whenever possible from December to March, radio monitoring for tagged Gulf sturgeon should be conducted prior to detonations to locate individuals within the zone of impact.

West Indian Manatee: The West Indian manatee rarely migrates into the study area of the surf zone off of SRI. Occurrences of manatees in the study area would occur during the summertime and rarely during the winter. Visual surveys of the study area are very likely to detect the presence of manatees, and conducting the tests during the wintertime would lessen the likelihood of detrimental impacts to the West Indian manatee.

4.2.4 Alternative 3

Alternative 3 proposes all of the activities described in Alternatives 1 and 2 with the additional establishment of areas for expanded Special Operations training and LCAC maneuvering/ training involving live fire and amphibious assaults (Table 4-14).

Table 4-14. Alternative 3 Additional Noise-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation for Similar/Related Actions
	Live	Inert		
Live Fire (Small Arms)	Y		Various Locations (See Figure 2-6)	None
Expanded Special Operations Training	N/A			ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c) LCAC/GPU-5 Integration Demonstration Environmental Assessment (U.S. Air Force, 1998b)
Amphibious Assaults	N/A			
Expanded LCAC Training/Maneuvers	N	Y		

These activities would mainly involve covert beach landings and assaults to include full-scale beach assaults or small-scale exercises involving dropping off personnel in rubber boats. Personnel would navigate in, conduct a covert landing on the beach, and capture a target on the Island or proceed to transit the Island and go to the mainland. Live fire capability using low-range, high-fragmentation munitions would be enabled in these areas. The areas evaluated would also serve as LCAC crossing areas and maneuver areas, AAV maneuver areas, and would enable live fire from the Sound towards the Gulf.

Gunnery Noise

LCAC 30-mm Live Fire

During the baseline, impulsive noise from ordnance use was limited to 30 mm ammunition. These rounds created approximately 155 dBP Sound Pressure Level (SPL) at one meter from the source and required auditory protection for persons in close proximity to the weapon. However, noise levels attenuate rapidly as distance increases between the weapon and the receptor. Since live fire procedures establish safety zones and require evacuation of all persons not directly involved in the operation, and the mission occurred within the restricted/prohibited area of Santa Rosa Sound, no non-participant was exposed to potentially harmful noise levels.

Noise assessment of 30 mm live fire from the LCAC was accomplished using the same basic procedure as that described above for the LCAC maneuver operations. However, the firing area for the weapon within the overall one square mile operation area was limited to a more centralized zone. The assessment considered the firing of 900 rounds during the range period. Since people are somewhat more sensitive to impulsive noise, the live fire assessment considered both a 24-hour equivalent noise level and the more traditional annual day-night average for the single exercise conducted. These sound levels are shown in Table 4-15.

Table 4-15. LCAC 30-mm Live-Fire

Distance from Edge of Maneuver Area (in feet)	Noise Levels: 1 Operation [$L_{eq(24)}$] C-Weighted	
	Leading Edge	**Lateral Edge**
500	53.9	50.0
1,000	51.6	48.4
1,500	49.8	47.1
2,000	48.3	46.0
2,500	47.1	45.0

Source: U.S. Air Force 2003h

Potential Noise Impacts to the Public

Neither average nor single-event noise thresholds would be exceeded from 30 mm live fire. The closure of the area to nonparticipants would provide safe distances to the public from noise exposure. Personnel aboard the LCAC would have to wear ear protection.

Potential Noise Impacts to Biological Resources

It is likely that species in the immediate vicinity of the LCAC maneuver areas would move outside 500 feet of the maneuver area due to the general disturbance caused by the LCAC. 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.

Small Arms Live Fire

Live-fire operations involving small caliber weapons between 5.56 mm and .50 cal are evaluated here. As with the 30-mm live fire exercise, impulsive sound levels associated with the small arms ranges are such that persons on the range participating in the exercise would require ear protection. However, due to range safety criteria, nonparticipants would be sufficiently separated from the noise and would not be exposed to any adverse health or safety risks.

The noise assessment for this element of the alternative was conducted using the same methodology as that applied to the assessment of the 30 mm live fire exercise. However, for these small arms exercises, it was assumed that the "range" area would be more constrained, measuring 1,000 feet by 1,000 feet. For each exercise, it was assumed that approximately 1,000 rounds of varied-caliber ammunition would be expended. Sound levels associated with use of these arms at their firing location vary from approximately 142 dBP to 160 dBP (AFOSH, 1994). Table 4-16 provides data on sound levels resulting from a single operation in a 24-hour period. The typical noise contours associated with small arms fire on the Island are shown previously in Figure 4-1. As indicated by the table below and Figure 4-1, activities associated with small arms live fire would be expected to create minimal or no noise impacts.

Table 4-16. Small Arms Live-Fire Range

Distance from Edge of Maneuver Area (in feet)	Noise Levels Single Operation ($L_{eq(24)}$) C-Weighted	
	Leading Edge	**Lateral Edge**
500	61.6	61.3
1,000	57.6	57.5
1,500	54.9	54.9
2,000	52.9	52.9
2,500	51.3	51.3

Source: AFOSH, 1994; U.S. Air Force, 2003h

Potential Noise Impacts to the Public

Neither average nor single-event noise thresholds would be exceeded from small arms live fire. The closure of the area to nonparticipants would provide safe distances to the public from noise exposure. No significant adverse impacts are anticipated.

Potential Noise Impacts to Biological Resources

Species within the immediate vicinity of the small arms firing area would likely exhibit a startle response to the noise. However, foraging species would typically move on other areas, while nesting species would return after the general disturbance. 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.

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 (less than 0.02 nests per night per 0.5 mile). Given these low emergence rates, 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.

Expanded LCAC Operations/Amphibious Assaults

Noise impacts from LCAC operations on the Island are considered under two modes of operation: 1) the crossover transit of the craft over the Island, and 2) maneuvering of the craft during other specific missions and during live fire exercises on SRI. Locations of the proposed maneuver areas and crossover areas were shown previously in Figures 2-1, 2-2, and 2-6. Under Section 4.2.1 for the No Action Alternative and Alternative 1, noise impacts from LCAC use are detailed in the sections on LCAC Noise. These analyses also apply to noise impacts for Alternative 3.

It should be noted that at greater distances sound levels are significantly less. Furthermore, tracks would be somewhat random through these bodies of water, and the probability of successive exposures at short ranges is low.

Table 4-17 reflects aggregated noise levels at a range of distances from the indicated edges of the maneuver areas. Shown are the equivalent noise levels resulting from one operation in a 24-hour period [$L_{eq(24)}$]. This is a conservative estimate since it assumes that all exercises occur in the same maneuver area.

Table 4-17. LCAC Maneuver Noise Levels

Distance From Edge of Maneuver Area (in feet)	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

Source: U.S. Air Force, 1999; Table author created

Aggregated noise levels at a range of distances from the indicated edges of the crossover areas would be the same as those identified under Alternative 2. Those noise levels would be applied to each crossover area.

Single Event Noise from LCAC Operations

LCAC operations would produce noise of approximately 90 ASEL just under a distance of 400 feet. Within that distance, people would be exposed to a level of noise identified by the state of Florida as "annoying." The actual wording of the statute states that no vessel shall exceed a sound level of 90 dBA at a distance 50 feet away from the vessel. Clearly, this statute is meant to address recreational vessels with typical inboard or outboard engines. The LCAC is equipped with four AVCO-Lycoming aircraft-type engines, which do not comply with the Florida boat noise statute due to their sizeable horsepower. Noise limits of the statute can be complied with through activation of the restricted 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. Figure 2-6 in Chapter 2 shows the maneuver areas associated with Alternative 3 LCAC activity on SRI.

Under this alternative, amphibious landing and maneuver activities involving the use of Zodiacs, LCACs, AAVs, and LCUs would occur at various locations on the Island. Noise impacts associated with amphibious exercises on SRI were analyzed in the ARG/MEU Environmental Assessment. The ARG/MEU analysis only examines the 7-mile training area and crossover location at A-13B, but the impacts and avoidance and minimization measures presented for the ARG/MEU are applicable to the other crossover locations on the Island given the similarity of conditions. The following is a summary of those findings.

An "exercise area" was described that started approximately 8,000 feet at-sea from the beach, included the beach area, and continued 3,000 feet inland from the beach, along the expected line of advance. This area covered a frontal width of 1,500 feet. Analysis assumed that the actual activity would occur in successive waves. As a result, noise was estimated for one wave of activity, with a wave being composed of several LCACs, AAVs, an LCU, and other land-based equipment. The total exercise area developed was 1,500 feet wide and 11,000 feet deep (16,500,000 square feet, or approximately 0.6 square miles).

Table 4-18 reflects aggregated noise levels at a range of distances from the indicated edges of the exercise area. Shown are the calculated noise levels and equivalent operations resulting from one operation in a 1-hour period [$L_{eq(1)}$] and a 24-hour period [$L_{eq(24)}$].

Table 4-18. Noise from Amphibious Landing (One Exercise Wave) in A-Weighted Decibels

Distance (in feet)	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
	$L_{eq(24)}$	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

Potential Noise Impacts to the Public

For activities associated with SRI (not inclusive of Santa Rosa Sound), no residential or commercial areas fall within the 90 ASEL threshold contour; thus no nonparticipant should be exposed to potentially harmful noise levels. All marine traffic within a 1-mile zone would be restricted during the mission, so harmful impacts to boaters are also highly unlikely.

Potential Noise Impacts to Biological Resources

Biological resources of concern here include sea turtles, marine mammals, the piping plover, and other shorebirds.

Sea Turtles: During night operations, the noise generated by an LCAC craft's centrifugal fans and gas turbine engines, as well as the general disturbance caused by a craft of this size (88 feet

long and 47 feet wide), 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 the landing corridors. Loggerhead nests have been documented on SRI below MHW (Miller, 2002). As a result, use of LCACs for amphibious landing activities or expanded maneuvers at night during sea turtle season should be avoided whenever possible. Adherence to proper avoidance and minimization measures, as described following this narrative, can greatly reduce the potential for adverse impacts to sea turtle populations. Amphibious landing activities during the day are expected to have no effect on nesting deterrence.

Marine Mammals: 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.

Piping Plover/ Shorebirds: An LCAC corridor/maneuver area is proposed for the area between A-3½ and A-3. Known shorebird nesting areas are located at A-3½ and A-3, which are within 0.5 mile of the corridor/maneuver area. LCAC activity at this site should be limited during shorebird nesting season to minimize impacts. Another LCAC maneuver area is proposed along the Gulf shoreline near A-18. Piping plover critical habitat is located adjacent to this site and shorebird nesting habitat is located within 0.5 mile. LCAC activity at this site would need to avoid piping plover habitat, and activities would need to be limited during the shorebird nesting season (1 March to 31 August) and the piping plover wintering season (15 July to 15 May). Similarly, at the proposed LCAC corridor west of A-17A, activities during shorebird nesting season would need to be limited due to its proximity to a shorebird nesting area at A-17A, which is within 0.5 mile. No amphibious landing activities would occur near piping plover critical habitat. Shorebird foraging activities may be disrupted during amphibious landings at designated sites. However, this disturbance would likely cause the species to move to another location and continue foraging activities. Although amphibious landing activities may result in a flushing response of nesting shorebirds, increased predation of nests is unlikely, as these activities would also likely frighten predators as well. Shorebirds would most likely return to their nests after completion of the activity. Thus, no long-term impacts would be expected.

4.2.5 Noise Summary

The following table (Table 4-19) is a summary matrix of potential noise impacts associated with the Alternative Actions.

Table 4-19. Noise Impacts Analysis Summary

Resource Area	Alternative			
	No Action	1	2	3
Threatened/Endangered Species	A	○	λ	λ
Marine Mammals				
Wildlife			○	
Aquatic Species			λ	
Public			○	

A = Assessed as needed based on proponent need through 813 process
○ = Minimal Potential Impacts, Potential Minor Constraints/Considerations Recommended
λ = Potential Impacts, Constraints Necessary

Noise Impact Management Recommendations

Specific mission-related management requirements and mitigations have been outlined in previous NEPA documentation and ESA and MMPA consultations. Pertinent documents associated with identified mission activities have been identified earlier in this section under each alternative. The management requirements/mitigations identified for these mission activities would apply to the alternatives and associated mission activities described in this document. The following are general management recommendations for minimizing potential noise impacts to humans and wildlife from operations associated with the Action Alternatives. Specific mission related management requirements/mitigations can be reviewed in associated NEPA or consultation documentation.

Sensitive Species/Wildlife/Aquatic Species

Surf Zone Testing

To reduce impacts to sea turtles, calving dolphins, and manatees, surf zone testing should be conducted between 1 November and 1 March, when possible. Nighttime testing would not occur at any time of year. Stranding reports for all five sea turtle species have been documented from the northern Gulf region, including the occurrence of a juvenile Kemp's ridley stranding from Choctawhatchee Bay in Okaloosa County. Based on documented nesting and stranding information, there is a potential for any of the five sea turtle species to occur within the proposed test areas. Sea turtle nesting in the northwest region of Florida generally initiates in mid-May, with turtles beginning to congregate offshore in the March/April time frame. Peak nesting activity occurs in June and July, and nesting generally concludes by the end of August. Seasonal timing of the tests would reduce the probability of species occurrence and would preclude the potential for hatchlings to be affected.

Should testing occur during March and October, the following management requirements are recommended.

- No detonations within 24 hours of any turtle nest hatching on Air Force property within 3 miles in either direction of the site of detonation.
- Beach setup activities should be preformed during daylight hours only during sea turtle season.

The following management requirement is recommended regardless of the timing of the test.

- Pre- and post-detonation monitoring would be conducted using a vessel and/or aircraft to survey the impact area for protected species. If a protected species were sighted within the impact area, tests would be postponed until the animal is clear of potential Level B noise impacts.

Land Based Activities

To reduce impacts to nesting shorebirds, whenever possible, all land-based activities would avoid known shorebird areas during nesting season (1 March to 31 August). Piping plover critical habitat would be avoided at all times.

Nighttime actions occurring on the beach face to the primary dune line should be minimized from May to October to avoid the potential for impacts to nesting and hatchling sea turtles. If a sea turtle were observed on the beach during activities, personnel would remain quiet, allowing the turtle to continue her activities. If hatchling sea turtles were observed on the beach, all activities would cease until the hatchlings reached their destination.

Live Fire Activities

Live fire activities would be minimized near shorebird nesting areas during nesting season and piping plover critical habitat during the wintering season. Nighttime live fire would be minimized whenever possible, and all firing would cease if an adult or hatchling sea turtle were observed on the beach, allowing the turtle to continue activities.

Helicopter Operations

Helicopter landings on the beach would be minimized during sea turtle season and would be kept brief at all times of year. Only designated areas are to be used for troop extraction during the sea turtle season. If a sea turtle nest is within 200 feet of the primary extraction zone (PZ), another PZ would be used for that exercise.

Public

Management requirements for noise include measures to minimize and reduce the noise or provide public notification. The proponent will implement a variety of management requirements to do so. The public will be notified in advance of training exercises.

4.3 DIRECT PHYSICAL IMPACTS

Direct physical impacts (DPI) to wildlife, soils, vegetation, and cultural resources could result from vehicular, aircraft, boat, and foot traffic, detonations, gunnery, and missiles. These types of mission activities frequently produce fragments that could potentially cause physical injury to wildlife species and damage undiscovered cultural resources. Additionally, vehicular and foot traffic could crush sensitive species and cultural resources, and boats and aircraft could collide with animals, causing injury or death.

Because Santa Rosa Island and the surrounding area are cleared of military and nonmilitary personnel prior to the initiation of mission activities, it is highly unlikely that humans would be hit by fragments or debris. However, the potential for damaging sensitive plants, wildlife, and cultural resources exists.

Environmental Analysis

Analysis of mission activities having the potential for direct physical impacts to sensitive species and cultural resources is outlined as follows.

- Mission activities were selected to represent the typical usage of Santa Rosa Island for testing.
- Potential impact zones associated with representative missions were identified using best available data.

- Sensitive species and areas with high probability of cultural resources within potential impact zones were identified.

4.3.1 No Action Alternative

Under the No Action Alternative, the status quo would be maintained, and environmental analysis would be conducted for each mission on an as needed basis, depending on whether or not similar mission activities have been previously analyzed and approved under the EIAP process. Because of the dynamic nature of the Eglin AFB test and training regime, it is difficult to anticipate the numbers and types of missions that may involve the use of SRI. Unlike the other action alternatives where a mission use plan is outlined and specific actions can be directed to specific locations and a qualitative analysis can be conducted, by definition the No Action Alternative allows for the potential for an activity to be conducted anywhere on the Island (provided the proper analysis is conducted).

4.3.2 Alternative 1

Under Alternative 1, the following activities that would potentially create direct physical impacts and respective dedicated locations analyzed are given in Table 4-20. Similar activities have either occurred at these locations in the past or are planned for the future and have been analyzed and approved under other NEPA or ESA Consultation documents.

Table 4-20. Alternative 1 DPI-Related Mission Activities and Locations

Activity	Ordnance Type		Associated Impact		Associated NEPA/ESA Section 7 Documentation
	Live	Inert	Biological Resources	Cultural Resources	
Personnel/ Equipment Drops & Extractions	N/A	Throughout Surf Zone	Bird air strike/ collision	None	Overland Air Operations PEA (U.S. Air Force, 1998) U.S. Army Ranger Los Banos Training Biological Opinion (U.S. Air Force, 2003d) Advanced Skills Training Program Biological Assessment (U.S. Air Force, 2003e)
OA-HITL Testing	N/A	HITL Tower and Focus Sites	None		Santa Rosa Island Reconstitution Test Capabilities Environmental Assessment (U.S. Air Force, 1998a)
Ground Testing	Y	TA A-15	Vehicle collision/ foot trampling		LAMBS Biological Assessment (U.S. Air Force 2002a) Joint Biological Point Detection System (JBPDS) at Multiple Test Ranges Environmental Assessment (U.S. Air Force, 2003b) Airborne Littoral Reconnaissance Technologies Project Biological Assessment (U.S. Air Force, 2004a)
LCAC Crossings	N/A	~TA A-13B			LCAC/GPU-5 Integration Demonstration Environmental Assessment (U.S. Air Force, 1998b) ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a)
Ground Training	Y	Various Locations (Figure 2-1)			ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) U.S. Army Ranger Los Banos Training Biological Opinion (U.S. Air Force, 2003d Advanced Skills Training Program Biological Assessment (U.S. Air Force, 2003e)

Restricted Access Measures

Alternative 1 would also involve establishing the following restricted access measures on the eastern portion of SRI.

- Maintain existing fencing along the south side of Hwy 98 bordering Eglin property.
- Maintain public access at Destin Bridge and Beasley Park as it is today.
- Post signs at public access points advising beachgoers of potential restriction of beach access during time of mission activity as a public safety and mission integrity measure.
- Air Force and other authorized personnel will continue to patrol the USAF Island property to maintain mission integrity, protect public safety and Air Force property, and execute the Air Force environmental stewardship mission.

Under Alternative 1, a dedicated DoD Mission Use Plan would be established qualifying the above-listed locations for the associated activities. These activities would be approved at the respective locations, and mission-by-mission analysis and approval would not be required in the future for such activities.

Under Alternative 1, the following activities would not be associated with dedicated sites, and would therefore require mission-by-mission approval as with the No Action Alternative.

- Surf zone testing and training
- Small boat obscurant testing
- Live fire activities
- Expanded Special Operations training
- Amphibious assaults
- Expanded LCAC operations

These activities would be evaluated through the EIAP process on a case-by-case basis and appropriate environmental management actions (i.e., consultations, permits, etc.) would be implemented if deemed necessary.

Potential Direct Physical Impacts to Sensitive Species

Numerous sensitive species are present on Santa Rosa Island and in the waters immediately offshore, including the Santa Rosa beach mouse, sea turtles, shorebirds, wading birds, piping plover, Gulf sturgeon, dolphins, and the perforate reindeer lichen. Under Alternative 1, potential direct physical impacts associated with approved mission activities include the following.

- Bird air strikes and collisions with boats and other craft
- Crushing/trampling of plant and animal species by vehicle or foot traffic

Bird Air Strike/Collisions

Bird-aircraft strikes and the hazards they present are a safety concern that the Air Force addresses through the Bird Aircraft Strike Hazard (BASH) Reduction Program. The goals of the

program are to reduce bird strikes through awareness, bird control, bird avoidance, and aircraft design. The Air Force uses a bird avoidance model, which incorporates past strike information, bird migrations, and flight patterns to minimize the potential for bird strikes, which can result in loss of aircraft or human life. More than 95 percent of bird-aircraft strikes occur at altitudes below 3,000 feet above ground level (AGL), and most of these occur near airfields (U.S. Air Force, 1997c).

Low-level aircraft use has the potential to directly impact shorebirds and/or wading birds. Piping plover critical habitat is located over 5 miles from HITL tower and is not expected to be impacted by aircraft traffic associated with HITL tower. Aircraft may fly by HITL tower at altitudes ranging from 100 to 30,000 feet above ground level. HITL tower is not an airfield, so operations at HITL tower would not include takeoffs and landings of aircraft, thus greatly reducing the risk of collision. No shorebird nesting areas are found near HITL tower, but shorebirds may feed near the tower in wetlands or along shoreline areas. Avoiding flights one hour before and after sunrise/sunset when shorebirds are known to be more active can minimize the potential for strikes. Additionally, birds can be scared from the area by noise producing devices or bioacoustics (U.S. Air Force, 1997). No endangered bird species would be impacted, so it would not be necessary to consult with the U.S. Fish and Wildlife Service. Kirtland Air Force Base (Major Peter Windler, 505-846-5674) may also be contacted for information on the Bird Avoidance Model (BAM) and further guidance regarding BASH issues. Aircraft activities at HITL are not likely to directly impact shorebirds, wading birds, or piping plovers.

During certain missions, troops may rappel onto the Island from helicopters and during the Ranger training, helicopters may land briefly at two designated landing zones on the beach. During the troop insertions, helicopters may hover at an altitude of about 20 to 50 feet or land at PZ NYE or PZ OPUS for a maximum of 5 minutes while troops deploy. In the unlikely event that a bird is found in or near the landing/troop insertion area, the bird would likely be temporarily flushed from the area. No direct physical impacts to shorebirds, wading birds, or piping plovers from helicopter operations are expected.

Vehicle Collision/Foot Trampling

Wheeled vehicle and troop movements 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 would 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 here activities. All effort would be made not to 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 1 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 (e.g., LCACs, AAVs, Zodiacs, wheeled vehicles) may be staged on the beachfront during the day and/or night. Although female sea turtles may be discouraged from nesting where vehicles/craft are left on the beachfront at night, only limited numbers would be left 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.

The perforate reindeer lichen is found landward of the primary dunes in the scrub and coastal grassland communities. Currently, the lichen is located north of A-2, east of A-10, and west of A-10. 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. The LCAC crossing at A-13B is not located near any piping plover critical habitat or shorebird nesting habitat, so there is little chance of direct impact to those species from LCACs. 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.

Potential Direct Physical Impacts To Cultural Resources

The potential adverse effects due to physical disturbance and/or destruction of cultural resources are the focus of this analysis. On the Island and in the surf zone, there is potential to disturb cultural resource sites by crushing, trampling, or ground disturbing activities associated with vehicle, personnel, or equipment movement; construction; digging; direct strikes by ordnances, or other activities that disturb soil. Pre-mission consultations with 96 CEG/CEVH can minimize the potential for impact to cultural resources. Areas to avoid can be identified by 96 CEG/CEVH and communicated to units. In order to prevent disturbance of cultural resources, 96 CEG/CEVH should be notified prior to changes in training routes or if ground-disturbing activities are desired. If a new site is discovered while conducting a mission, all activities should cease immediately and 96 CEG/CEVH should be contacted.

Troop Movements

Troop movement is unlikely to affect archaeological sites except where artifacts are located on the surface of the ground or the soil is exceptionally soft or devoid of vegetation. Sites on Santa Rosa Island, although predominately subsurface, are vulnerable to foot traffic because of the loose sand matrix containing the artifacts. All eligible archaeological sites on Santa Rosa Island

would be fenced and avoided if possible. Where avoidance is not possible, data recovery excavations would be developed and carried out in consultation with the SHPO.

Areas designated as high probability zones that have not yet been surveyed for the presence of cultural resources would be marked on maps and avoided by troops if possible. Where troops must operate in high probability zones, vulnerable areas would be avoided. Vulnerable areas include soft, sandy soil, and areas where artifacts (glass, bricks, arrowheads, pottery shards, etc.) are noted on the surface of the ground. Troops would be prohibited from collecting or moving artifacts from their original locations. All ground-disturbing activities, such as the establishment of fighting positions, would occur only in areas known to be devoid of cultural resources, or in areas cleared by data recovery excavations.

Vehicle Movement

Tracked and wheeled vehicles land on and cross over Santa Rosa Island. These vehicles have great potential to cause direct impact to cultural resources through the displacement of soil, and secondarily through increased erosion. Compaction of soils caused by the sheer weight of the vehicles can also cause adverse effects to sites. Cultural resources on the portion of Santa Rosa Island proposed for missions involving vehicles would need to be identified and evaluated for National Register eligibility prior to the commencement of training exercises. Eligible properties would be fenced and avoided if possible. Sites that cannot be avoided would undergo data recovery excavations.

Though LCACs have less of an impact on cultural resources than do wheeled or tracked vehicles, they have the potential to adversely affect archaeological sites by causing the direct displacement of artifacts from their original context. It is not known whether eligible historic properties are located within the proposed LCAC corridors, but any significant resources located within the corridors would need to be fenced, avoided, and mitigated.

Pyrotechnics and Munitions Use

Pyrotechnics and munitions would be used only in areas known to be devoid of cultural resources or in areas frequently used for those purposes. High probability zones that are likely to contain archaeological sites would be subjected to Phase I and Phase II surveys prior to the use of pyrotechnics or munitions except where frequent pyrotechnics or munitions use has made the presence of intact sites highly unlikely, or where the presence of unexploded ordnance precludes archaeological surveys due to safety concerns.

4.3.3 Alternative 2

Alternative 2 includes the activities proposed in Alternative 1 plus the establishment of Surf Zone Test Areas (SZTAs) on SRI to support major surf zone test exercises and small boat obscurant testing (Table 4-21). Impacts associated with Alternative 1 are described in the Alternative 1 analysis section. For Alternative 2, the following activities have the potential to result in direct physical impacts to sensitive species and cultural resources.

Potential Direct Physical Impacts to Sensitive Species

Proposed activities for the Surf Zone Test Areas include not only surf zone detonations, but also use of the beach face for LCACs and other equipment during test preparations. In order to allow for year-round access, the potential for additional direct physical impacts to multiple sensitive

species, especially sea turtles, would need to be addressed through management practices. In addition to the monitoring and nest protection programs that are already in place, additional procedures to protect nesting and emerging sea turtles are detailed in Appendix E. These procedures are very comprehensive and could be used as guidance for all SRI surf zone activities that may be conducted during sea turtle nesting and hatching season. Establishment of designated Surf Zone Test Areas would facilitate logistics and adherence to a set of programmatic management requirements.

Table 4-21. Alternative 2 DPI-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated Potential Impact	Associated NEPA/ESA Section 7 Documentation
	Live	Inert			
Designated Surf Zone Testing/Training Areas	Y		TA A-15, TA A-10, ~TA A-2	Injury from blast	Final Environmental Assessment for Coastal Testing of the SABRE and DET Systems(U.S. Air Force, 1999) Final Biological Assessment for Testing of the SABRE System, the DET System, MK-82 General Purpose Bombs, and the MK5 Mine Clearance System, Santa Rosa Island (U.S. Air Force, 1998c) Final Environmental Assessment for Testing of the MK-82 General Purpose Bombs and MK-5 Mine Clearance System (U.S. Air Force, 1999a) Letter of Authorization for the Incidental Harassment of Marine Mammals from Surf Zone Testing Missions at Eglin AFB, FL (U.S. Air Force, 1998d) Naval Explosive Ordnance Disposal School Training Operations Biological Assessment (U.S. Air Force, 2004)
Small Boat Obscurant Testing	N/A		Throughout Surf Zone	Boat collision	None

Blast Injury

In the waters surrounding the Island, there are sensitive marine species such as dolphins, Gulf sturgeon, and sea turtles. Surf zone activities that may impact these species include amphibious craft movement and surf zone detonations.

Specific management requirements for detonation activities in the surf zone have been outlined in the Biological Assessment and Environmental Assessments for the SABRE, DET, MK-82, and MK-5 Mine Clearance Systems (U.S. Air Force, 1998, U.S. Air Force, 1999; U.S. Air Force, 1999a) at Test Site A-15. These management requirements have been approved on a case-by-case basis and could serve as the basis for programmatic management requirements for all surf zone activities.

- Testing would be accomplished in a minimum of five days under test conditions of calm to four-foot seas.

- Testing would only be conducted under daylight conditions of suitable visibility and sea state.
- All assets would be recovered from the surf/beach along with all instruments and hardware.
- Testing would be conducted between 1 November and 1 March to ensure that nesting shorebirds, sea turtles, calving dolphins, and West Indian manatees were avoided.
- Thirty-minute pre-mission aerial overflights of the Gulf target and adjacent areas, with 96 CEG/CEVSN personnel onboard as observers, would be conducted. Survey area would be based on the model-predicted impact area for each test system (Table 4-22). If protected marine species were observed within the target or closely adjacent areas, testing would be delayed until the area was certified clear.
- Thirty-minute post-mission aerial surveys would be conducted to search for any marine species potentially injured or killed.
- If any impact to marine species occurred beyond what has been considered, all operations would immediately cease until the appropriate regulatory agency was notified.
- On-shore operations would be performed using four-wheel drive vehicles operating along routes cleared by Natural Resource and Cultural Resource personnel.

Table 4-22. Survey Area of the Injury Impact Zone Data for Each Test System

Test System	Maximum Water Depth (m)	Survey Area for Aerial Surveys
SABRE-22	10	0.75 km radius from test site
SABRE-23	10	1.0 km radius from test site
DET	12	1.0 km radius from test site
MK-82 GPB	18	6.0 km radius from test site
MK5 MCS	6	0.5 km radius from test site

If any sea turtles, Gulf sturgeon, or marine mammals were sighted during clearance activities, detonations would be delayed until the animal had moved outside of the zone of impact. If at any time there was more than a 10-minute period between detonations, then clearance surveys would need to be reinitiated. Pre- and post-detonation surveys would be conducted under the supervision of a trained biologist. The additional requirement of delaying detonations after a known turtle nest hatching for 24 hours would minimize impacts to sea turtle hatchlings.

Sea Turtles: Abundance and density data from the aerial survey portion of the GulfCet study best reflect the abundance and density of sea turtles within the area of interest. The survey area is known as the Minerals Management Service Eastern Planning Area and may be divided into continental shelf and slope regions.

In order to provide improved species conservation and protection, the species density estimate data were adjusted to reflect a more realistic situation and consider 1) temporal and spatial variations, 2) surface and submerged variations, and 3) overall density estimate confidence.

Temporal and Spatial Variations: The GulfCet II aerial surveys have identified different density estimates of sea turtles between winter and summer seasons, as well as between the shelf and slope geographic locations. Accordingly, the greatest species density estimate available for any given season or location was utilized for conservative impact assessments.

Surface and Submerged Variations: The GulfCet II surveys focus on enumerating animals detected at the ocean surface and therefore do not account for submerged animals. As such, the surveys do not provide a relative density estimate for the entire potential population of a given species. To provide a more conservative impact analysis, density estimates may be adjusted to account for submerged individuals. The species considered in this assessment are at the surface approximately 10 percent of the time (Moore and Clarke, 1998). Impacts are considered both by taking submergence into account and by considering surface time.

Density Estimate Confidence: The density estimates of sea turtles resulting from GulfCet II aerial surveys were determined with an associated standard deviation and resulting coefficient of variation. Each of these analyses provides a measure of confidence about the resultant density estimate. An upper confidence value of 2.576 standard deviations (approximately a 99 percent confidence level) was utilized to further adjust the density estimate for each species.

Table 4-23 summarizes adjusted density estimates for adult sea turtles in the water.

Table 4-23. Sea Turtle Densities Based on GulfCet II Surveys

Species	Individuals/ 100 km^2	Individuals/mi^2	Adjusted Density (per mi^2) Surfaced Individuals	Adjusted Density (per mi^2) Total Population
Loggerhead	4.253	0.1102	0.1753	1.1667
Leatherback	0.327	0.0085	0.0211	0.0973
Kemp's ridley	0.097	0.0025	0.0100	0.0326
Unidentified	0.340	0.0088	0.0191	0.0984

km^2 = square kilometer(s) mi^2 = square mile(s)

Although no green sea turtles were identified by GulfCet II surveys, this species is known to occur, at least periodically, offshore of Eglin Air Force Base. Green turtles nest every other year on beaches along Santa Rosa Island, including Eglin property and adjoining areas. It is assumed that the turtles labeled as "unidentified" during the GulfCet II surveys include green turtles.

In addition to adult turtles, hatchlings are present at certain times of the year. Loggerhead turtles nest most years on Santa Rosa Island, and green turtles nest every other year. Leatherback turtles nest on the island infrequently. Nesting generally occurs between May and August, and the incubation period is approximately 60 days. Eglin AFB has maintained turtle hatchling data since 1998. The average number of sea turtle nest occurrences by month for SRI is shown in Figure C-1 in Appendix C, and the average nesting density for each portion of SRI is shown in Figure 3-3.

Out of the 454 sea turtle nests laid on Eglin property on SRI from 1989-2003, emergence dates were available for 245 nests, but only 130, or 29 percent, had complete nest content and hatchling emergence data available. These 130 nests occurred from 1998–2003. Data from these nests were used to calculate the average number of eggs per nest and the average number of emergent hatchlings for each species. These data are presented in Table 4-24 below. The maximum recorded number of emerged hatchlings is also listed for each species. Please note that this maximum is well above the calculated average.

Table 4-24. Average Eggs and Emergent Hatchlings per Nest on Eglin AFB SRI

	Number of Nests	Total Eggs	Average Eggs Per Nest	Total Emerged Hatchlings	Average Emerged Hatchlings Per Nest	Maximum Recorded Emerged Hatchlings Per Nest
Loggerhead	85	8822	104	5619	66	149
Green	44	6016	137	2145	49	162
Leatherback	1	84	84	58	58	58

Table C-1 in Appendix C shows the number of sea turtle nests that would be expected to hatch on average during each month of the hatching season. In Table 4-25 below, the highest average monthly hatching rate was selected and multiplied by the maximum recorded number of emerged hatchlings per nest to yield the highest expected number of sea turtle hatchlings produced during a one-month period.

Table 4-25. Calculated Peak Hatchling Numbers and Densities for Eglin AFB SRI

	Loggerhead	Green	Leatherback
Highest average hatch occurrences/month	12.53	4.43	0.21
Maximum hatchlings/nest	149.00	162.00	58.00
Hatchlings/month	1866.39	717.83	12.43
Hatchlings/day	62.21	23.93	0.41
Density in water (#/mi^2)	0.37	0.14	0.00

mi^2 = square mile(s)

A density estimate for hatchlings in the water can be made by using the length of shoreline surveyed (17 miles) and a distance offshore with the conservative assumption that the hatchlings remained generally within that area. If the offshore distance of 10 miles is selected, the total area is 170 square miles. Assuming that all hatchlings move into this 170 square mile area and are uniformly distributed, the resulting density is shown in Table 4-25. A large number of emergent hatchlings probably would not reach the water or would perish soon after entering the water because of predation and other factors, but to be conservative this analysis assumes a 100 percent survival rate.

Each proposed Surf Zone Testing Area covers approximately one square mile, and will be used as the action area for analysis (Table 4-26).

Table 4-26. Number of Offshore Sea Turtles Within Any Given Surf Zone Test Area

Species	Number of Surface and Submerged Sea Turtles	Number of Hatchlings
Loggerhead	1.167	0.37
Leatherback	0.097	0
Kemp's ridley	0.033	0
Unidentified	0.098	N/A
Green	*	0.14
TOTAL	**1.4**	**0.51**

Effects Estimation for Sea Turtles

For any given surf zone detonation, an area of up to 1 square mile may be directly impacted. Multiplying the number of turtles per square mile (from Tables 4-25 and 4-26) by the impact area (1 square mile) provides an estimate of the maximum number of turtles potentially impacted.

Table 4-26 indicates that the expected maximum number of sea turtles (adults and hatchlings) within any given surf zone area would be less than two based on conservative estimates. Some percentage of these two individuals may be directly affected by shrapnel, but the likelihood is considered remote. Turtles would likely leave the area due to noise produced during set up of the detonations. Visual surveys detailed at the beginning of the surf zone section would further ensure clearance of the area. Any given surf zone detonation occurring during nesting season has the potential to directly impact two sea turtles, but with visual clearance surveys, this is unlikely. Surf zone activities occurring outside of nesting season are not anticipated to affect sea turtles.

Marine Mammals: In the surf zone, direct impacts to these species from detonations would be minimized by the visual clearance procedures (aerial reconnaissance surveys or by boat) detailed at the beginning of this section. Shrapnel from detonations would not likely impact protected marine species since the area would be visually cleared before testing begins. The range of shrapnel dispersal would be less than the estimated Zone of Injury described in the noise section. In addition, for surf zone testing, the activity of personnel getting the test ready in the water column should cause animals to leave the immediate vicinity.

Gulf Sturgeon: Gulf sturgeon migrate from freshwater into Gulf waters during cold weather. From December to March, clearance procedures would be needed to identify sturgeon near the detonation site. Monitoring for radio-tagged Gulf sturgeon would be conducted when possible. Impacts are unlikely since clearance procedures would be employed and individuals would likely be driven away by personnel prior to the test.

Boat Collisions

Small boats would be used periodically for obscurant testing throughout the surf zone. Table 4-26 above shows that 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 detailed at the beginning of the surf zone section would further ensure clearance of the area. Boat activity occurring during sea turtle season is not likely to directly affect sea turtles. Activity occurring outside of sea turtle season is not anticipated to affect sea turtles.

Marine mammals are extremely mobile and have a good sense of hearing, thus would likely be scared from the vicinity of any boat traffic by noise, minimizing the likelihood of any direct impacts.

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. Gulf sturgeon are also extremely dispersed in Gulf waters, and the likelihood of an encounter with a boat is highly unlikely.

Beachfront Activities

Beachfront activities associated with surf zone testing also 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, NEODS personnel would use the beachfront to practice inert mine countermeasure procedures on mines they pulled out of the Gulf. 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.

Potential Direct Physical Impacts to Submerged Cultural Resources

It is unknown at this time whether or not submerged cultural resources exist within or near the proposed surf zone test areas. To comply with all applicable laws and regulations, the cultural resources management program at Eglin proceeds in phases that reflect the federal mandate to identify, evaluate, and consider the effects of its actions on historic properties. Identification of historic properties is conducted through systematic archaeological surveys (often referred to as Phase I surveys) directed by professional archaeologists. For purposes of inventory, the reservation has been divided into high and low probability zones for cultural resources. Inventory is not required in low probability zones. High probability zones must be inventoried for the presence of cultural resources. Santa Rosa Island and its near shore areas are considered high probability zones.

As a result, evaluation of the proposed surf zone test areas in coordination with 96 CEG/CEVH for the presence of submerged cultural resources (e.g., shipwrecks, etc) would need to be conducted prior to establishment of the test areas. Identified cultural resources identified during the survey would be evaluated, in consultation with the SHPO, to determine whether they were eligible for listing on the National Register. All eligible properties would be avoided, if possible. This may involve reconfiguration of the surf zone test areas. If avoidance were not possible, a data recovery plan would be developed in consultation with the SHPO. Data recovery excavations would be completed prior to any training activities that could affect the sites.

4.3.4 Alternative 3

Alternative 3 proposes all of the activities described in Alternatives 1 and 2 with the additional establishment of areas for expanded Special Operations training and LCAC maneuvering/training involving live fire and amphibious assaults. The activities under Alternative 3 as listed in Table 4-27 may potentially result in direct physical impacts to sensitive species and cultural resources.

Table 4-27. Alternative 3 DPI-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated Potential Impact	Associated NEPA/ESA Section 7 Documentation for Similar/Related Actions
	Live	Inert			
Live Fire (Small Arms)	Y		Various Locations (See Figure 2-6)	Shrapnel/Direct Hit	
Expanded Special Operations Training	N/A			Trampling/Vehicle Collisions	ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c)
Amphibious Assaults	N/A				
Expanded LCAC Training/Maneuvers	N	Y			

Potential Direct Physical Impacts to Sensitive Species

In addition to the impacts associated with Alternative 2, approved mission activities under Alternative 3 would potentially result in the following impacts.

- Shrapnel or direct hit from live fire training
- Trampling or vehicle collisions from troop and vehicle movements during Special Operations training, amphibious assault exercises, and LCAC training maneuvers

Shrapnel/Direct Hit

The live fire areas proposed for Santa Rosa Island would use low-range munitions. Small caliber weapons between 5.56 mm and .50 caliber would be used and 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 non-lead 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 2000 meters.

Nighttime use of munitions has the potential to impact sea turtles. Examination of the peak rate of sea turtle nesting emergences per night per unit area of beach front can help determine how many nesting emergences, if any, could potentially be directly impacted by munitions use. The peak sea turtle nesting rates were estimated in Appendix C. The peak rate of loggerhead turtle nesting emergences is 0.012 nests per night per 0.5 mile, and the peak rate of green turtle nesting emergences is 0.007 nests per night per 0.5 mile. Because only three leatherback nests have been documented on Eglin AFB, SRI, over a 14-year period, the leatherback nesting emergence rate is effectively nil.

Given the low rates of nesting emergences even during peak nesting season, 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 Santa Rosa Island could potentially directly affect piping plovers, wading birds, and/or shorebirds. Live fire is proposed for an LCAC maneuver area near A-18, which is close to both piping plover critical habitat and a shorebird nesting area. Live fire is also proposed for an LCAC corridor east of A-17A and an LCAC maneuver area east of A-3½, both which are located within 0.5 mile of shorebird nesting areas. 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, 2000 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.

Vehicle Collision/Foot Trampling

Amphibious landings 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 movements on land.

Sea Turtles

Direct physical contact between sea turtles and amphibious vessels could occur. The analysis below examines potential for direct impacts from amphibious landings. The largest proposed operation to date involving heavy watercraft traffic is the ARG/MEU, utilizing LCACs, AAVs, LCUs, and Zodiacs. Because of the scope of the ARG/MEU and the fact that the Gulf species densities used in the ARG/MEU apply throughout the offshore waters of SRI, the analysis on potential direct impacts to species in the water presented in the ARG/MEU Environmental Assessment is applicable to other smaller amphibious landing activities to be conducted at SRI and will be used here as the maximum potential amount of amphibious traffic present in the Gulf off of SRI. The total area of operations considered for impacts analysis was 70 square miles.

During the 10-day period of ARG/MEU exercises, there is an average of 130 crossings of LCACs between the Navy ships and shore (65 round trips), 78 crossings by AAVs, and

42 crossings by LCUs. LCACs are the largest vessels and their beam measurement (width) is used for conservative impact analyses. An LCAC is 47 feet in beam width, which is 0.0089 miles. The distance from Navy ship to shore is approximately 10 miles, so the total surface area potentially impacted per trip is 0.089 square miles. Multiplying this number by the total number of crossings results in a total water surface area of 22.25 square miles. Impact calculations for this section utilize sea turtle density estimates that have been derived from aerial surveys during the GulfCet II surveys. The estimated number of surface and submerged sea turtles within the vessel transit areas is presented in Table 4-28.

Table 4-28. Number of Offshore Sea Turtles Within Vessel Transit Areas

Species	Number of Sea Turtles at the Surface	Number of Hatchlings
Loggerhead	3.9	8.2
Leatherback	0.5	0
Kemp's ridley	0.2	0
Unidentified	0.4	N/A
Green	*	3.1
TOTAL	**5**	**11.3**

* Turtles listed as unidentified by GulfCet II are assumed to include green sea turtles. N/A = not applicable.

Table 4-28 indicates that the expected maximum number of sea turtles within the vessel transit area would be approximately 16, based on conservative estimates. Some percentage of these 16 individuals may be affected through direct contact with a boat or amphibious vessel, but the likelihood is considered remote. Numbers of sea turtles potentially directly impacted by amphibious activities other than the ARG/MEU would likely be less than 16 since other operations would be smaller than the ARG/MEU. For all amphibious assault activities, adult turtles would likely avoid collision, because the LCUs move very slowly and the LCACs produce loud noise that might be detected some distance away. Thus, the greatest potential risk would be related to 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 certain missions, tracked vehicles (AAVs and tanks) would land on the shoreline. At designated corridors, tracked and wheeled vehicles would traverse along the shoreline and crossover the Island. When driving along the shoreline, vehicles would remain at least 50 feet from the primary dune line. Any night vehicle operations on the beachfront pose a threat of direct physical impact to sea turtle nests, adults, and hatchlings, and may obscure sea turtle tracks. To prevent this, all corridors would be surveyed for evidence of sea turtle activity immediately prior to night activities.

AAVs may also potentially be used in the proposed 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.

During certain operations, vehicles/craft (e.g., LCACs, AAVs, Zodiacs, wheeled vehicles) may be staged on the beachfront during the day and/or night at proposed staging areas at A-2, A-3,

A-10, A-13B, and A-15. Although female sea turtles may be discouraged from nesting where vehicles/craft are left on the beachfront at night, only limited numbers would be left 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 landing and staging of vehicles on the beachfront at night during sea turtle season is not likely to directly impact sea turtles.

Heavy troop movements also have the potential to directly impact sea turtles, but it is unlikely. Of more concern is the potential for these movements 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.

Between 1 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. If a sea turtle were observed on the beach during activities, personnel would remain quiet, allowing the turtle to continue its activities. All effort would be made not to 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. An observer would be stationed at each nest within 10 days of the expected hatch date in areas where nests were not relocated.

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 did require relocation would be moved in accordance with FWC Marine Turtle Conservation Guidelines (FWC, 2002), and all nests would be monitored daily by permitted surveyors. See Appendix E for more detail on sea turtle avoidance and minimization measures.

The LCAC is a "hovercraft," riding on a cushion of air approximately 4 feet above the surface. Therefore, no portion of the LCAC hull structure is expected to penetrate the water or land surface and therefore would have no direct physical impact on sea turtles.

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, as described in Appendix E, can greatly reduce the potential for direct impacts to sea turtle populations.

<u>Marine Mammals</u>: The only marine mammals that commonly occur inshore are the bottlenose dolphin and the Atlantic spotted dolphin. Bottlenose dolphin density estimates derived from aerial surveys during the GulfCet II surveys for the offshore area are 0.31 animals per square mile. Manatees occur infrequently in the north Florida panhandle and would not be affected. The largest vehicles that would be moving in the near offshore waters of the Island are LCACs,

and their beam measurement (width) is used for conservative impact analyses. Based on the sea turtle analyses above, the total water surface area potentially impacted by all ARG/MEU crossings is 22.25 square miles. The estimated number of bottlenose dolphins in this area is 6.9. Dolphins would easily avoid collision because the LCUs and AAVs move very 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.

Piping Plovers, Wading Birds, and Shorebirds: 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 movements through nesting areas. As a result, shorebird nesting areas should be avoided during nesting season (1 March to 31 August).

Perforate Reindeer Lichen: The perforate reindeer lichen is found landward of the primary dunes in the scrub and coastal grassland communities. Currently, the lichen is located north of A-2, east of A-10, and west of A-10. 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 movements.

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 (they feed 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 7 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.

Potential Direct Physical Impacts to Cultural Resources

The potential adverse effects due to physical disturbance and/or destruction of cultural resources are the focus of this analysis. On the Island and in the surf zone, there is potential to disturb cultural resource sites by crushing, trampling, or ground disturbing activities associated with vehicle, personnel, or equipment movement; construction; digging; direct strikes by ordnances; or other activities that disturb soil. Pre-mission consultations with the 96 CEG/CEVH can minimize the potential for impact to cultural resources. Areas to avoid can be identified by 96 CEG/CEVH and communicated to units. In order to prevent disturbance of cultural resources, 96 CEG/CEVH should be notified prior to changes in training routes or if ground-disturbing activities are desired. If a new site is discovered while conducting a mission, all activities should cease immediately and 96 CEG/CEVH should be contacted. Potential impacts from troop movement, vehicle movement, and pyrotechnic/munitions use would be the

same as those described under Alternative 1, although on a larger scale due to the increased area of activity (e.g., maneuver areas, staging areas, etc.).

4.3.5 Direct Physical Impacts Summary

Potential direct physical impacts to the sensitive species and cultural resources of SRI would be most likely to occur as a result of amphibious craft, troop movements, munitions use, tracked/wheeled vehicle movement, surf zone detonations, and missile testing. Table 4-29 summarizes the potential direct physical impacts of these mission activities to resources under all alternatives.

Table 4-29. Direct Physical Impacts Summary

<table>
<tr><th rowspan="2">Resource Area</th><th colspan="4">Alternative</th></tr>
<tr><th>No Action</th><th>1</th><th>2</th><th>3</th></tr>
<tr><td>Sea Turtles</td><td rowspan="7">A</td><td colspan="3">λ</td></tr>
<tr><td>Gulf Sturgeon</td><td>○</td><td colspan="2">λ</td></tr>
<tr><td>Piping Plover/Shorebirds/ Wading Birds</td><td colspan="2">○</td><td>λ</td></tr>
<tr><td>Marine Mammals</td><td>○</td><td colspan="2">λ</td></tr>
<tr><td>Reindeer Lichen</td><td colspan="3" rowspan="2">○</td></tr>
<tr><td>Beach Mouse</td></tr>
<tr><td>Cultural Resources</td><td>○</td><td colspan="2">λ</td></tr>
</table>

A = Assessed as needed based on proponent need through 813 process
○ = Minimal Potential Impacts, Potential Minor Constraints/Considerations Recommended
λ = Potential Impacts, Constraints Necessary

Direct Physical Impacts Management Recommendations

Specific mission-related management requirements and mitigations have been outlined in previous NEPA documentation and ESA and MMPA consultations. Pertinent documents associated with identified mission activities have been identified earlier in this section under each alternative. The management requirements/mitigations identified for these mission activities would apply to the alternatives and associated mission activities described in this document. The following are general management recommendations for minimizing potential direct physical impacts to sensitive species and cultural resources from operations associated with the Action Alternatives. Specific, mission related management requirements/mitigations can be reviewed in associated NEPA or consultation documentation.

Sensitive Species

Surf Zone Testing

To reduce the potential for direct impacts to sea turtles, calving dolphins, and manatees, surf zone testing should be conducted between 1 November and 1 March whenever possible. No nighttime surf zone testing will be conducted. Sea turtle nesting in the northwest region of Florida generally initiates in mid-May, with turtles beginning to congregate offshore in the March/April time frame. Peak nesting activity occurs in June and July, and nesting generally concludes by the end of August. Hatchlings usually have all emerged by late October, but in some years hatching may extend into November. Seasonal timing of the tests would reduce the probability of species occurrence.

Should testing occur during March to October, the following management requirements would be implemented.

- No surf zone detonations within 24 hours of any turtle nest hatching on Air Force property within 3 miles in either direction of the site of detonation.
- Beach setup activities would be preformed during daylight hours only during sea turtle season.
- All ruts deeper than 2 inches created by setup activities would be removed prior to sunset during sea turtle hatching season (July to October).

The following management requirement would be implemented year-round.

- Pre- and post-detonation monitoring would be conducted using a vessel and/or aircraft to survey the impact area for protected species. If a protected species were sighted within the impact area, tests would be postponed until the animal is clear of potential Level B noise impacts.

Live Fire Activities

To minimize the potential for direct impacts to sea turtles, marine mammals, piping plovers, and shorebirds from live fire activities:

- Use frangible munitions when possible.
- Direct all live fire towards the Gulf.
- Avoid live fire missions nearshore bird nesting areas during nesting season (1 March to 31 August) and piping plover critical habitat during wintering season (15 July to 15 May) whenever possible.
- If a sea turtle or hatchling is observed on the beach during live fire activities, cease all firing until the turtle adult has finished its activities or the hatchlings have reached the water.
- Conduct live fire testing only under conditions of suitable visibility and sea state.
- For live fire over water, conduct pre-mission surveys of the Gulf target and adjacent areas. If marine mammals, sea turtles, or Gulf sturgeon are observed within the target or closely adjacent areas, testing would be delayed until the area is certified clear.
- Conduct post-mission surveys to search for any marine mammals, sea turtles, or Gulf sturgeon potentially injured or killed.

Amphibious Landing and Land-based Activities

To reduce the potential for direct impacts from amphibious landing and land-based activities to sea turtles, piping plover, shorebirds, beach mice, and the perforate lichen:

- No daytime (sunrise to sunset) mission-related beachfront activities begin before completion of daily sea turtle nest survey and protection measures (nest marking or relocation) from 1 May to 31 October unless approved through a Section 7 consultation.

- Limit the size of vehicular movement corridors to the minimum necessary for the mission.
- Limit vehicular movement as close to the waterline as possible and at least 50 feet below the primary dune line.
- Mark landing corridors so as to be easily distinguished by the operators of amphibious landing vehicles/craft.
- Remove all ruts deeper than 2 inches prior to sunset during sea turtle hatching season.
- Where approved, relocate sea turtle nests that are laid within designated crossover and access corridors.
- Mark and protect all known sea turtle nests in accordance with established Eglin Natural Resources Section and state protocol.
- Instruct troops and personnel to avoid marked sea turtle nests by at least 50 feet.
- For nighttime activities that are conducted on the beach between 1 May and 1 September, a one-time nesting survey is conducted two hours prior to the start of the activity on the portion of the beach where the activity will occur. All nests located during surveys at night are marked and protected (or relocated where approved) before the nighttime activity begins.
- To the extent practicable, stage vehicles and watercraft at water's edge. Whenever it is necessary to stage vehicles on the beachfront, install silt screens around the base of the vehicles.
- If a sea turtle is observed on the beach during activities, personnel will remain quiet, allowing the turtle to continue its activities. All effort will be made not to obscure the turtle crawl or the nest area.
- If hatchling turtles are observed on the beach, all activities will cease until the hatchlings reach their destination. All effort will be made not to obscure the turtle crawls or the nest from where they emerged.
- Between 1 May and 31 October, when activities will be conducted on the beach during the night, one participant will be designated as an observer to be responsible for identifying signs of nesting or hatchling sea turtles. The observer will be responsible for assuring 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.
- Within the designated activity area, on the nights that certain mission activities occur, an Eglin Natural Resources Section observer is stationed at each nest that is at or past incubation day 60. In the event that the nest hatches, the observer coordinates with the mission participants to ensure that the hatchlings have unimpeded access to the water. Eglin Natural Resources Section provides location information to the mission participants about each nest that is at or past incubation day 60.
- Lichen populations and surrounding suitable habitat on the restricted portion of Eglin SRI property are fenced and flagged with infrared tape with a 10-foot buffer to prevent inadvertent trampling of lichen mats.
- Eglin provides a 24-hour contact person to event participants from 1 May through 30 November. The contact is available to respond to or handle emergencies related to harm

or injury to sea turtles and to answer questions related to endangered species and the mission activities.

Boat or Amphibious Craft Activity

To reduce potential impacts to hatchling sea turtles in the water, avoid *Sargassum* mats.

Aircraft Activity

To reduce potential impacts to birds from aircraft, work with the Bird Air Strike Hazard (BASH) committee.

Cultural Resources

To minimize impacts to cultural resources, archaeological sites would be avoided where possible utilizing the following methods.

- Construct barriers such as fences or mark sites in the field and on maps.
- Instruct troops to avoid high probability zones during ground movements and to avoid areas where artifacts can be seen on the ground.
- Instruct troops not to collect, damage, or move artifacts from their original location.

When avoidance of sites is not feasible, mitigation strategies would be designed in consultation with the Florida SHPO.

4.4 HABITAT ALTERATION

Habitat alterations characterize the physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to the survival of a species. A habitat in this instance refers to the 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. Important habitats for Santa Rosa Island include:

- Coastal grassland: habitat for protected species
- Dunes: protect mainland from storms, habitat for protected species
- Salt marsh: extremely productive component of estuarine ecosystems
- Scrub, mesic flatwoods: habitat for protected species
- Supratidal zone: nesting and feeding area for protected species
- Surf zone: feeding and foraging area for protected species

Environmental Analysis

This section analyzes the potential for mission activities to negatively impact the physical condition of habitats associated with Santa Rosa Island. While difficult to quantify, the potential for habitat alteration to occur can be evaluated qualitatively and minimization procedures can be identified that would reduce the potential for adverse impacts. Ecological sensitivities of special concern include active erosion and destruction of wetlands. Submerged near-shore habitat may also be impacted by SRI missions.

4.4.1 No Action Alternative

Under the No Action Alternative, the status quo would be maintained, and environmental analysis would be conducted for each mission on an as needed basis, depending on whether or not similar mission activities have been previously analyzed and approved under the EIAP process. Because of the dynamic nature of the Eglin AFB test and training regime, it is difficult to anticipate the numbers and types of missions that may involve the use of SRI. Unlike the other action alternatives, where a mission use plan is outlined and specific actions can be directed to specific locations and a qualitative analysis can be conducted, by definition the No Action Alternative allows for the potential for an activity to be conducted anywhere on the Island (provided the proper analysis is conducted).

4.4.2 Alternative 1

Under Alternative 1, the activities that would potentially create habitat alteration impacts and respective dedicated locations are shown in Table 4-30. Similar activities have either occurred at these locations in the past or are planned for the future and have been analyzed and approved under other NEPA or ESA Consultation documents:

Table 4-30. Alternative 1 Habitat Alteration-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation
	Live	Inert		
Ground Testing	Y		TA A-15	LAMBS Biological Assessment (U.S. Air Force, 2002a) Joint Biological Point Detection System (JBPDS) at Multiple Test Ranges Environmental Assessment (U.S. Air Force, 2003b) Airborne Littoral Reconnaissance Technologies (ALRT) Project Biological Assessment (U.S. Air Force, 2004a)
LCAC Crossings	N/A		~TA A-13B	LCAC/GPU-5 Integration Demonstration Environmental Assessment (U.S. Air Force, 1998b) ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force 2003a)
Ground Training	Y		Various Locations (Figure 2-1)	ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force 2003a) U.S. Army Ranger Los Banos Training Biological Opinion (U.S. Air Force, 2003d) Advanced Skills Training Program Biological Assessment (U.S. Air Force, 2003e)

Restricted Access Measures

Alternative 1 would also involve establishing the following restricted access measures on the eastern portion of SRI.

- Maintain existing fencing along the south side of Hwy 98 bordering Eglin property.
- Maintain public access at Destin Bridge and Beasley Park as it is today.
- Post signs at public access points advising beachgoers of potential restriction of beach access during time of mission activity as a public safety and mission integrity measure.
- Air Force and other authorized personnel will continue to patrol the USAF Island property to maintain mission integrity, protect public safety and Air Force property, and execute the Air Force environmental stewardship mission.

The City of Destin currently has a five-year lease with Eglin to utilize the western jetty of the Destin Pass for a Fourth of July fireworks display. This lease was granted on the condition that security is utilized to restrict the public from entering shorebird nesting areas.

Under Alternative 1, a dedicated DoD Mission Use Plan would be established qualifying the above-listed locations for the associated activities. These activities would be approved at the respective locations, and mission-by-mission analysis and approval would not be required in the future for such activities.

Under Alternative 1, the following activities would not be associated with dedicated sites, and would therefore require mission-by-mission approval as with the No Action Alternative.

- Surf zone testing and training
- Small boat obscurant testing
- Live fire activities
- Expanded Special Operations training
- Amphibious assaults
- Expanded LCAC operations

These activities would be evaluated through the EIAP process on a case-by-case basis and appropriate environmental management actions (i.e., consultations, permits, etc.) would be implemented if deemed necessary.

Under Alternative 1, the following activities are not likely to result in habitat alteration impacts and were therefore not analyzed in this section.

- Electronic Systems/ECM Testing/Training
- S/A Missile Testing
- OA-HITL Testing
- Personnel/Equipment Drops and Extractions

Impacts to Sensitive Habitats

Sensitive habitats include high quality plant communities, wetlands, floodplains, and the beach dune community. Activities minimizing impacts to sensitive habitats are preferred and the planning process should reduce or minimize ground-disturbing projects or actions occurring in these areas whenever possible.

No activities would occur within any Marine Protected Areas (MPAs). In the study area, the nearest boundary of the closest MPA, the Desoto Canyon Closed Area, is more than 20 miles offshore and the area is designated as closed by NOAA Fisheries to certain methods of fishing. Therefore, SRI activities would not affect Marine Protected Areas and are not discussed further.

Coastal Protection Areas: Based on a 1992 FNAI report on coastal upland communities (Johnson et al., 1992) Coastal Protection Areas were designated on Santa Rosa Island. These were areas that had 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 current survey can be made, 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. Therefore, impacts to these sensitive areas are expected to be minimal.

Beach Dune Community: The beach dune community is one of the most predominate vegetative communities present on Santa Rosa Island (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 infrastructure.

Repeated disturbance to dunes can result in their destabilization and destruction; however, it is not likely that LCAC operation would result in a significant change in dune height. Observation of LCAC sand displacement showed that two LCAC passes resulted in only a 0.75-inch decrease in dune elevation (SAIC, 1998). These measurements were taken immediately after LCAC crossings occurred. If more time had elapsed between the crossings and the measurements, it is likely that any sand displacement caused by the LCAC would be overshadowed by the amount of natural, wind-driven sand displacement. Moreover, within the LCAC crossover corridors, LCACs may not use the same exact path of travel through the corridors, and it is likely that the sand displacement caused by one LCAC would be counteracted by the displacement of another. While south of the crossover site at A-13B is relatively flat with sparse vegetation, north near the sound is a vegetated wetland area. However, LCACs, being hovercraft, have not been shown to adversely impact grasses of the sort that are present north of the site.

Vehicle traffic and substantial troop movements may also occur in certain areas. Due to the fragility of the dune ecosystem, all vehicle and troop movements 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 for the mission, and corridors would be marked so as to be easily distinguished by vehicle operators.

Wetlands: Multiple small wetlands are located across Santa Rosa Island (Figure 3-2, in Chapter 3). Impacts to wetlands would potentially occur as a result of either destruction or

degradation. The main activities that could potentially impact wetlands are troop and vehicle movements on the Island.

For most operations, vehicles would remain on established roads, causing no impacts to wetlands. However, in certain situations, vehicles and troops would need to move in areas without roads, creating the potential for wetlands to be impacted even if avoidance measures were taken. If a vehicle operator was not sure whether an area was a wetland, he would move to higher ground. For vehicle traffic, the distribution of wetland areas at some sites may make complete avoidance difficult, but 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 Executive Order 11990. No significant impacts to wetland habitats are anticipated from occasional foot traffic or LCAC crossovers due to the "hovercraft" nature of the LCAC.

Floodplains/CZMA: Executive Order 11988 requires examination of actions involving construction (i.e., buildings, roads) within a floodplain for the potential to impact drainage patterns within the floodplain or for the potential for people or structures to be impacted by flooding in order to minimize or prevent loss of life and property.

Floodplains are present on Santa Rosa Island from A-13A to just east of A-6 along portions of the shore, mostly on the soundside. Within these floodplain areas, no operations under Alternative 1 involve construction activities, thus there are no anticipated impacts to floodplains.

With consideration of potential impacts to wetlands and floodplains, Alternative 1 is consistent with the Coastal Zone Management Program of the state of Florida. No changes to the floodplain would result, and impacts to wetlands would be minimized where possible through avoidance. In Appendix D, consistency of the proposed action with the FCMP and the CZMA is identified.

Impacts to Water Quality

The major water quality concern for SRI missions is potential changes in turbidity. Metals introduced into the Gulf from ammunition and flares are also of concern and are examined below.. No changes to pH or nutrient levels are anticipated and thus will not be analyzed.

Ground Training: Troop movement and bivouac during ground training would potentially generate wastewater. Eglin AFB requires that graywater wastes generated on Santa Rosa Island be disposed of properly. Graywater is shower and sink wash water produced from field operations. Existing Eglin AFB procedures for handling 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 several locations. Coordination with the 96 Civil Engineering Group at Eglin AFB would ensure that these requirements are met.

Dispersed troop movements through water bodies are not anticipated to impact water quality. Large troop movements would strive to avoid trampling wetland vegetation. Digging would be avoided near water bodies. Provided these minimization procedures are adhered to, troop movement is not anticipated to impact water quality on Santa Rosa Island.

Vehicles would remain on designated roads for most operations; however, they would maneuver along the shoreline in certain areas and would be crossing the Island at A-13B. Along the shoreline, turbidity impacts would not be anticipated. At the crossover site, the distribution of wetland areas makes complete avoidance difficult, but it would be possible to choose routes to minimize disturbance to wetlands.

30 mm Guns: The amount of steel and aluminum debris that would be deposited in the Gulf of Mexico from LCAC 30 mm firing operations equates to about 0.8201 pounds per round. By comparison, artificial reef materials are placed in nearshore waters on the order of hundreds of tons per year. 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, the dispersion of the water column in the Gulf and the slow rate of oxidation would ameliorate an impact on water quality.

The increase in the deposition of iron is not expected to cause the water quality in the Gulf of Mexico, or in the immediate vicinity of the debris, to reach the concentration of 300 µg/L iron that is detrimental to the marine environment. Aluminum from projectiles deposited in the marine or terrestrial environment is not in a chemical form that is readily leached for environmental transport or exposure. Studies done with aluminum chaff (which has larger surface area and is more readily available than 30 mm cartridges) show that exposed aquatic organisms have not demonstrated toxic effects even when exposed to abnormally high concentrations of aluminum (U.S. Air Force, 1996a).

Flares: The significant chemical products from flare utilization are carbon, magnesium products, and aluminum. Carbon and graphite are non-toxic 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 (U.S. Air Force, 1996a). 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, limits set for health risk assessments determine that up to 67,000 flares could be released in a peak hour, and 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 nontoxic nature of major chemical combustion products from flare use and the dispersion of marine waters suggests that the current flare usage does not harm the biological environment or threatened and endangered species.

Habitat Impacts to Soils

LCACs: LCAC crossings occur at TA A-13B, which is a relatively flat area with minimal vegetation. An LCAC dune crossing study conducted on Shoal Point, Panama City, Florida (SAIC, 1998), concluded that a maximum of 0.75 inches of sand was displaced after two consecutive passes of an LCAC within the same vicinity, with little to no impacts to dune vegetation. During certain missions there may be a large number of crossings in a short period

of time, and 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 coastal breezes would eliminate most of the footprint caused by the LCAC flyover activity in a short period of time. These movements are not anticipated to result in adverse impacts to soils, as these craft are essentially hovercraft. Erosion impacts from LCAC use are not anticipated.

Ground Training: On Santa Rosa Island, wheeled vehicles may be used 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 would remain off dunes higher than 5 feet.

Although infrequent, helicopter landings do occur on SRI. In areas where these landings occur, significant erosion can result from the downwash caused by the rotor of the aircraft. When possible, helicopter landings should be minimized because these areas become more vulnerable to storm surge washover. Additionally, only OPUS and NYE PZs should be utilized for landings.

Troops would potentially walk on Santa Rosa Island in shoreline and interstitial areas during ground training. As discussed earlier, the 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, all troops would avoid walking on established dunes over 5 feet in height. Provided these minimization procedures are adhered to, troop movement would not create any significant erosion problems.

Habitat Impacts from Wildfire

There is no prescribed burning program for Santa Rosa Island, but small wildfires have occurred as a result of pyrotechnics. Small wildfires may be started as a result of pyrotechnics use during training activities. The scrub community on SRI is fire maintained, with catastrophic wildfires expected about once every 20-80 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.

Habitat Impacts from Invasive Non-native Species

The ecological communities of barrier islands are very unique, and the Eglin AFB portion of Santa Rosa Island has some of the best remaining examples of many of these communities. The introduction of invasive non-native species to the Island could threaten the continued 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 completely take over an area, resulting in a monoculture of one invasive plant species. Secondary impacts can include the 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.

In the future when an area with a known invasive species problem is identified as an important area for a mission, Natural Resources Section staff should be notified 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.

Habitat Impacts from Artificial Lighting

Depending on the time of year, certain night mission-related lighting could have impacts on light-based cues for the survival of hatching sea turtles. Newly hatched sea turtles are oriented towards sources of light during their “return to sea” crawl. Consequently, if there are man-made light sources in the dunes, they may mistakenly crawl landward instead of towards the sea, resulting in unknown mortalities from predators and desiccation. 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 movements 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 hand-held lights and lighting on equipment at night.

Missions that require nighttime conditions, such as the setup of missile launches from TA A-15, should avoid sea turtle locations and seasons (May to 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 non-mission or safety lights. Management measures, including fencing off active nests and redirecting any disoriented hatchlings should be employed. Missions would need to work with the Natural Resources Section to implement these management measures.

Impacts to Sensitive Animal Species Habitat

Habitat impacts have the potential to affect the health of a number of sensitive animal species on Santa Rosa Island (Figures 3-2 and 3-4, in Chapter 3). Habitat for the Santa Rosa beach mouse, sea turtles, piping plover, wading birds, and shorebirds 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 the Natural Resources Section staff would be required to determine the habitats of sensitive species, which should be marked so that they can be avoided during missions.

Sea Turtles: Because the LCAC rides on a cushion of air approximately 4 feet above the surface of the sand, 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 activity, interfering with surveyors' ability to accurately locate, mark, and protect nest sites. Vehicle and heavy troop movement may also obscure evidence of sea turtle crawls and nests. To prevent this, the corridor 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 5 feet high, thereby reducing impacts to nesting habitat.

During certain operations, vehicles/craft (e.g., LCACs, AAVs, Zodiacs, wheeled vehicles) may land or be offloaded and then staged on the beachfront during the day and/or night. Although female sea turtles may be discouraged from nesting where vehicles/craft are left on the beachfront at night, only limited numbers would be left on the beachfront 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.

Piping Plover and Critical Habitat: At this time, the piping plover is the only species for which critical habitat has been designated on Santa Rosa Island. Within property administered by Eglin, critical habitat is situated on the north shore of SRI near A-18 (Figure 3-2). Troop and vehicle movement may possibly 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 movements 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.

Shorebird and Wading Bird Nesting Areas: State listed wading birds such as the snowy egret, little blue heron, tricolored heron, and white ibis forage mainly in wetland areas or along shorelines of saltwater and freshwater water bodies. A breeding area for several wading bird species is documented to occur along the west shore of East Pass on Santa Rosa Island. Vehicle

traffic and substantial troop movement through these areas has the potential to impact wading bird habitat. If key breeding sites were avoided, the impacts to the habitat of state listed wading bird species would not be significant.

Colonies or individual nests of several state-listed (but not federally listed) shorebird species (least terns, southeastern snowy plovers, and black skimmers) 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 Santa Rosa Island within the breeding seasons of these birds has the potential to impact reproductive success. If key breeding sites were avoided, the impacts to the habitat of these shorebird species would not be significant.

Santa Rosa Beach Mouse Habitat (Beach Dune Community): The primary foraging and sheltering habitat of the state-listed Santa Rosa beach mouse is within the primary, secondary, and tertiary sand dunes of Santa Rosa Island. Hovercraft and wheeled vehicles may operate on various portions of Santa Rosa Island, and troop movements may occur almost anywhere on the Island. Vehicles and troops are expected to avoid dunes that are greater than 5 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. Eglin AFB Natural Resources Section conducts quarterly track count surveys. Data from these surveys are expected to indicate any substantial change in beach mouse populations on SRI. Ground movements are not anticipated to adversely impact Santa Rosa beach mouse habitat.

4.4.3 Alternative 2

Alternative 2 includes the activities proposed in Alternative 1 plus the establishment of Surf Zone Test Areas (SZTAs) on SRI to support major surf zone test exercises and small boat obscurant testing. For Alternative 2, the activities that have the potential to result in additional habitat alteration impacts are shown in the table below (Table 4-31).

Table 4-31. Alternative 2 Habitat Alteration-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation
	Live	Inert		
Surf Zone Testing/Training	Y		TA A-15, TA A-10, ~TA A-2	Final Environmental Assessment for Coastal Testing of the SABRE and DET Systems (U.S. Air Force, 1999) Final Biological Assessment for Testing of the SABRE System, the DET System, MK-82 General Purpose Bombs, and the MK5 Mine Clearance System, Santa Rosa Island (U.S. Air Force, 1998c) Final Environmental Assessment for Testing of the MK-82 General Purpose Bombs and MK-5 Mine Clearance System (U.S. Air Force, 1999a) Naval Explosive Ordnance Disposal School Training Operations Biological Assessment (U.S. Air Force, 2004)

Activities associated with small boat obscurant testing are not expected to result in habitat alteration impacts. Therefore, small boat obscurant testing was not analyzed in this section.

Impacts to Sensitive Habitats

Floodplains/CZMA: Floodplains are present on Santa Rosa Island from A-13A to just east of A-6 along portions of the shore, mostly on the Sound side. Within this area, a surf zone testing area is proposed for A-10, which is considered floodplain. No construction activities would take place as part of surf zone testing; thus there are no anticipated impacts to floodplains.

With consideration of potential impacts to wetlands and floodplains, Alternative 2 is consistent with the Coastal Zone Management Program of the state of Florida. No changes to the floodplain would result, and impacts to wetlands would be minimized where possible through avoidance. In Appendix D, consistency of Alternative 2 with the FCMP and the CZMA is identified.

Essential Fish Habitat: The habitat on the Gulf side of Santa Rosa Island is a sandy/silty substrate, which does not support seagrass beds. The nearest major seagrass bed in the Gulf of Mexico 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 Essential Fish Habitat.

Sargassum is a free-floating brown algae that drifts as mats in oceanic eddies. Management requirements from previous operations call for missions to avoid *Sargassum* mats. Missions offshore of SRI would also avoid *Sargassum* mats; thus there would be no impacts to *Sargassum* that serves as Essential Fish Habitat.

Impacts to Water Quality

Surf Zone Testing: The proposed tests to be detonated in the surf zone release chemical by-products to the water column. These products are primarily chemical vapors, but also some liquids and solids. Table 4-32 describes the relative amounts of chemicals released to the environment as a result of the proposed MK-82, M5 MCS, SABRE, and DET tests. Each test involves a different explosive material and, as is shown, these materials have different relative concentrations of by-products. The analysis is based on four typical explosive materials used in surf zone testing. The explosive by-products of H-6, RDX, PBXN-103, and TNT are from an underwater detonation since detonation in the open air will create different by-products (O'Keefe and Young, 1984).

The major products of detonating explosives underwater in the proposed tests are carbon monoxide (CO), carbon dioxide (CO_2), nitrogen (N_2), aluminum oxide (Al_2O_3), water, and carbon. The gaseous products are not anticipated to impact air quality or water quality beyond an extremely short time period in the vicinity of the test. These gases will dissipate from the water into the atmosphere and become rapidly diluted. Rapid dispersion will preclude the gases from being available for any long-term exposure (U.S. Air Force, 1999).

Table 4-32. Explosion Products of Detonations in the Surf Zone

Explosion Products			H-6[1]	C-4[2]	PBXN-103[3]	TNT[4]
Gas	Liquid	Solid	% by weight	% by weight	% by weight	% by weight
CO			21.73	16.1	20.24	20.44
CO_2			0.295	24.3	0.571	33.72
N_2			21.12	34.0	9.47	18.16
H_2			1.233	0.2	9.47	0.109
NH_4			1.141	0.9	0.296	0.396
C_2H_6			3.265	1.7	0.002	4.69
C_3H_8			0.793	0.2	-	1.557
HCN			0.489	0.004	0.043	0.005
HCl			-	-	12.29	-
CH_4			0.156	0.1	0.005	0.173
	H_2O		-	-	4.193	6.82
	CH_3OH		0.004	0.002	-	0.002
	CH_2O		0.006	0.001	0.006	0.001
		Carbon	9.110	10.0	-	13.87
		Al_2O_3	39.17	-	51.03	-

Source: Summarized from U.S. Air Force, 1999.
[1]Material used in MK-82 GPBs
[2]Material used in M5 MCS (C-4 is 90% RDX)
[3]Material used in SABRE system tests
[4]Material used in live mines for DET test

Aluminum oxide occurs naturally in the environment as the minerals bauxite and bayerite. The largest contributor of Al_2O_3 is the detonation of H-6 explosive in MK-82 GPBs, where one test is expected to release 526.4 pounds. This chemical is likely to be present as a precipitant in ocean water, due to the fact that aluminum oxide is only soluble at pH values below 5.5 (U.S. Air Force, 1996a). The insolubility of this material prevents it from being readily available for bioaccumulation. It would take a large concentration of aluminum oxide to accumulate in a closed area to potentially cause toxicity (U.S. Air Force, 1996a). Due to the fact that aluminum oxide is ubiquitous in the environment, that the pH of Gulf waters is between 8.0 and 8.3, and that aluminum oxide rapidly dissipates from water circulation, aluminum oxide is not expected to impact water quality or to be toxic to marine life.

Solid carbon may result from an underwater detonation, depending on the type of combustion product utilized. The carbon is likely to be in the form of graphite fibers. TNT, H-6 explosive, and C-4 materials will produce a significant amount of carbon residue due to the inert filler. Carbon has been proven to be physiologically inert and nontoxic to living organisms. There have been no criteria established for elemental carbon in marine waters for recreational use or for sustaining healthy fish populations (U.S. Air Force, 1996a).

The MK-5 MCS was tested in the surf zone of Santa Rosa Island, off of Test Site A-15 in March 1999. The detonation produced a temporary discoloration of the water and a subsequent temporary discoloration of the beach. The discoloration had dissipated by the next time that the beach was observed, 24 hours later. Laboratory analysis of the residue revealed that the primary constituent was carbon graphite fibers with small amounts of silicon and sodium chloride residue (Kemron Environmental Services, 1999). The explosive C-4 is composed of 90 percent RDX, which does not produce a significant amount of carbon in an underwater detonation. However, the remaining 10 percent of C-4 is composed of a binder, polyisobutylene, which will create

carbon residue. This is due to the fact that all of the oxidation occurs with the combustion of RDX, and there is no oxygen remaining to convert the carbon of polyisobutylene to a gas.

Detrimental impacts to air quality, water quality, sediments, and marine life due to these surf zone tests will not be significant. This is due to the nontoxicity of chemicals released and the rapid dissipation of chemicals in the water column and within the atmosphere. Discoloration of the beach may occur due to carbon residue washing on shore. This impact will not extend toward the public areas of Okaloosa Island (the developed portion of Santa Rosa Island that is within Okaloosa County) and is not anticipated to negatively influence tourism or recreational activities in the vicinity.

Obscurant Use: The composition of the smoke grenade is approximately 1,200 grams of brass flakes for infrared obscurant (M-76), or 900 grams titanium dioxide (TiO_2) for visual obscurant (M-82). The summary of material amounts expended over the testing program would be 317 pounds (144 kilograms) of TiO_2 and 185 pounds (84 kilograms) of brass flakes (Edgewood Research, Development and Engineering Center, 1996).

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 (U.S. Air Force, 1996a).

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 (U.S. Air Force, 1996a). 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. The Environmental Assessment written for the Smoke on Boats proposal concludes that adverse environmental impacts are not anticipated for testing the smoke grenades (Edgewood Research, Development and Engineering Center, 1996).

Titanium dioxide would be released into the atmosphere over the surf zone from smoke grenades as planned in the Smoke on Boats testing (Edgewood Research, Development and Engineering Center, 1996). 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 (Edgewood Research, Development and Engineering Center, 1996). Titanium oxides are insoluble in water and will adsorb to particles and sediments (U.S. Air Force, 1996a). Titanium (titanium dioxide) is not expected to cause significant harm to ecological receptors in the ROI. 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 (U.S. Air Force, 1996a).

Impacts to Soils

Surf Zone Testing: Surf zone tests require the placement of charges directly on, or within, the sediment surface, which, upon detonation, can cause physical disruption to the sediment in the surf zone. Previous detonations of a line of SABRE shells in the Shallow Water Test Pond have resulted in a large berm across the pond. Test detonations in the surf zone are expected to create a similar berm, but tidal action should quickly wash away the berm, so that disruptions to the bottom sediment will only be temporary. Other detonations, such as the MK-82 bombs and M-58 line charge system, would also likely disrupt the surf zone sediment, but wave action is expected to rapidly redistribute sediment. Disruption of the sediments within the surf zone would promote disturbance of the benthic (bottom) environment of the intertidal area; however, redistribution of the sediment should occur quickly due to high-energy environment in the surf zone.

Year-round beach activities in the proposed Surf Zone Test Areas could increase beach habitat impacts. The main issue of concern would be ruts in the sand, which could interfere with the migration of sea turtle hatchlings to the sea. Management practices to ensure that ruts were minimized would need to be implemented during sea turtle hatching season (see Appendix E).

Impacts to Sensitive Species Habitat

Gulf Sturgeon and Critical Habitat: Surf zone detonations may temporarily create a berm and cause temporary increases in turbidity, but due to the high-energy nature of the Gulf, these impacts are expected to be short-term. The proposed action is also not expected to block migratory pathways. Impacts to Gulf sturgeon critical habitat from surf zone detonations are not anticipated.

Sea Turtle Beachfront Habitat: Beachfront activities associated with surf zone testing also 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 as inert mines and obstacles. For example, NEODS personnel would use the beachfront to practice inert mine countermeasure procedures on mines they pulled out of the Gulf. Such activities would require only a small portion of the beach (less than 100 feet of beachfront). Vehicle access to the beach may be required, but personnel would be instructed to avoid dunes greater than 5 feet in height, and during sea turtle season, all ruts would be removed prior to sunset.

4.4.4 Alternative 3

Alternative 3 proposes all of the activities described in Alternatives 1 and 2 with the additional establishment of areas for expanded Special Operations training and LCAC maneuvering or training involving live fire and amphibious assaults. The activities listed in Table 4-33 under Alternative 3 may potentially result in habitat alteration impacts.

Table 4-33. Alternative 3 Habitat Alteration-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation
	Live	Inert		
Expanded Special Ops Training	Y		Various Locations (Figure 2-6)	ARG/MEU Environmental Assessment (U.S. Air Force 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c)
Amphibious Assaults				
Expanded LCAC Training/Maneuvers	N	Y		

Impacts from Alternative 3 are the same as those for Alternative 2, with additional potential impacts from the activities listed above. Concentration of LCAC/Special Operations into established maneuver and crossing areas could locally increase habitat alteration impacts at the chosen sites. When possible, missions should be concentrated during the period from November to February to avoid conflicts with nesting animals, and, when possible, completely avoid testing near shorebird, wading bird, sea turtle, and beach mouse habitat. Also, vehicles would avoid vegetated areas to the greatest extent possible and travel at slow speeds to avoid causing erosion problems.

Impacts to Sensitive Habitats

Essential Fish Habitat: The occurrence of emergent vegetation on Santa Rosa Island appears to be primarily a wetland or beach component and not as fish habitat, since inundation by marine or estuarine waters occurs only during storm events. As such, the areas on the Sound side shoreline of Santa Rosa Island are technically considered wetland and are not providing fish habitat. No seagrass beds are located on the Gulf side of the Island.

Artificial reefs exist 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 proposed LCAC corridors, but due to the "hovercraft" nature of the LCAC, there would be no impacts below the surface of the water; however, contact between AAVs and LCUs which would be landing at A-13B 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 Santa Rosa Island are not likely to adversely impact essential fish habitat.

Coastal Protection Areas: As discussed under Alternative 1, vehicle and troop movements would be minimized whenever possible near these areas by staying on established roads and below the dune line until a current survey can be made of the condition of these areas. LCAC corridors or maneuver areas have been proposed at a number of locations that would cross Coastal Protection Areas, including east of A-17A and east of A-2. LCACs would not impact the ground surface and would not create any lasting physical impacts to vegetated areas. Given that these LCAC sites were chosen recently 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 once a current survey was conducted.

Wetlands: LCAC maneuver areas are located in areas that are void of wetlands; however, each of the proposed LCAC corridors passes through areas with wetlands. In most cases, these wetlands can 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.

Wetlands at the A-13B crossover point would be potentially impacted by AAVs even though avoidance measures would be taken. The crossover corridor at A-13B contains 7.10 acres of wet

prairie, and 0.81 acres of salt marsh, for a total of 7.91 acres of wetlands impacted by crossover activities. The distribution of wetland areas at the crossover site makes complete avoidance difficult, but it would be possible to choose routes to minimize disturbance to wetlands. Management requirements were established for the ARG/MEU training exercises and would be implemented during all crossings at A-13B.

Floodplains/CZMA: Floodplains are present on Santa Rosa Island from A-13A to just east of A-6 along portions of the shore, mostly on the Sound side. Within this area, an LCAC maneuver area is proposed for east of A-10, which is in the floodplain. The proposed LCAC corridor at A-6 crosses floodplain on the Gulf and Sound sides of the Island. No construction activities would take place at either of these locations, thus there are no anticipated impacts to floodplains.

With consideration of potential impacts to wetlands and floodplains, Alternative 3 is consistent with the Coastal Zone Management Program of the state of Florida. No changes to the floodplain would result, and impacts to wetlands would be minimized where possible through avoidance. In Appendix D, consistency of Alternative 3 with the FCMP and the CZMA is identified.

Impacts to Soils

Tracked Vehicles: Santa Rosa Island may experience landings, crossovers, and lateral movements of tracked vehicles during amphibious assault exercises. AAVs displace large amounts of sand when moving at high rates of speed, essentially creating a spray of sand out from behind. No data were available regarding the actual amount of displacement from an individual AAV; however, the amount may be substantial when considering the number of vehicles that would be operating on the Island during certain missions (e.g., ARG/MEU training). As a result, 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, AAVs would transit through designated corridors, avoiding vegetated areas in order to minimize shoreline erosion. Established splash points exhibiting minimal vegetation on the Sound side would be identified and adhered to. Additionally, shoreline stabilization actions such as planting of vegetation would be conducted around the edges of the splash points to minimize potential erosion.

Full crossing on the Island by tracked vehicles would be concentrated at A-13B, which is a relatively flat area that contains minimal dune vegetation. While it is anticipated that a fair amount of sand would be displaced over the short term, the vehicles could be spread out over the entire crossover area, which would help minimize potential impacts from channelized crossing. Waiting at least a few days between crossing events would allow winds to alleviate some of the sand displacement. Vehicles would be directed to stay at least 50 feet from any dunes 5 feet or higher and to avoid large clumps of vegetation. Over the short term there would be sand displacement from tracked vehicles utilizing the island. However, long-term impacts are not anticipated, as the dynamics of the barrier island would continue to shift sands across the face of the island and remove much of the footprint created by vehicle use. Impacts from lateral

movement along the beach would be minimal provided tracked vehicles maintain a minimum buffer of 50 feet from the primary dune line. Whenever possible, tracked vehicles would only travel laterally below the mean high water line. Provided the minimization procedures described above are adhered to, no long-term adverse impacts to soils or erosion rates from tracked vehicle use are anticipated.

LCACs: Alternative 1 covered potential impacts to soils at the designated A-13B corridor. That analysis also applies to the other proposed LCAC corridor and maneuver areas under this Alternative. Similar to A-13B, the additional sites proposed under Alternative 3 (Figure 2-6, in Chapter 2) are also relatively flat with little vegetation. Impacts to soils from LCAC movements at these sites are expected to be minimal.

Live Fire Training/Small Arms Use: There are three types of ammunition analyzed in this section: lead projectile munitions, frangible munitions, and "green" munitions with nonlead projectiles. Frangible munitions are of nonlead composition and of limited range, whereas green munitions have the same performance characteristics as standard lead ammunition.

Special operations units desiring to conduct live-fire operations have expressed a willingness to use frangible and green munitions, which are in various stages of development. Frangible munitions are relatively less toxic than standard lead-based projectile munitions and are primarily composed of tungsten-tin and held together with a nylon binder. Analysis of standard munitions (lead alloy projectile) is provided in this section as well, though military live-fire ranges across the nation are under scrutiny for lead contamination in soil and groundwater. Tungsten-based green munitions with ballistic properties similar to standard lead ammunition offer a less environmentally-impacting option.

The repeated use of copper and lead projectiles on the island could, over time, lead to potentially significant impacts on soil quality, plants, and animals as indicated by soil modeling, discussed later in this section.

Frangible munitions were developed to break apart upon hitting hard surfaces, thereby preventing the incidence of ricochets during close-quarter combat. Frangible bullets are not made from a lead projectile covered with a copper jacket, but rather are composites of hybrid materials pressed together with adhesives. Although the fragments from the bullets may corrode faster in the environment, potentially becoming more readily available to aquatic organisms than larger-fragment projectiles, the constituents are not as hazardous as lead.

Oak Ridge National Laboratory (ORNL) developed a nontoxic, all-metal replacement for lead in bullets. The frangible bullets are fabricated from mixtures of tungsten-tin. ORNL's Industrial Hygiene Department determined that the metals and alloys in the projectile material for the bullets are environmentally safe (ORNL, 2003a). Still, modeling indicates that tin levels in soil could increase near target areas to levels identified by USEPA as screening levels, requiring further analysis and monitoring.

Lead-free "green" bullets have been developed to replace copper-jacketed bullets. The bullets are produced with tungsten-tin or tungsten-nylon cores instead of lead. Depending on the composition, shape, size, and amount of heat treatment, the bullets may be frangible, as described above, or penetrating. Tungsten and tin do not have any known toxic characteristics when used as green bullets (Bogard, 1999). Tungsten, a nontoxic metal more dense than lead,

and tin, used extensively in food and beverage containers, are now used in the projectile slugs, resulting in ballistic performance equivalent to that of lead slugs but without the environmental impacts. Additionally, tungsten and tin are specified by federal law, 50 CFR, 1997, as nontoxic for use in shot for hunting migratory waterfowl. Also, these metals are not designated by USEPA as hazardous waste constituents and have no applicable federal land disposal restrictions (Bogard, 1999).

Compositions for standard 7.62 mm munitions and nonlead frangible 5.56 mm munitions were available and analyzed for potential effects to the environment. During live fire, the projectile, bullet cartridge, or casing and propellant would be introduced into air and water areas of the estuarine live-fire sites. The chemical materials of concern are the by-products of the bullets' propellant explosion and, for standard 7.62 mm rounds, the lead projectile. Since there are several variations of the 7.62 mm round, the M-80 ball munition frequently used in automatic weapons was selected for analysis. The 25.35 gram, 7.62 mm M-80 round consists of four major components: the propellant charge (3 grams), the cartridge case (12.3 grams), the bullet projectile (9.7 gram), and the primer or cap (0.35 grams). Table 4-34 lists the components of the M-80 WC846 propellant.

Table 4-34. 7.62 mm Munition Propellant Composition

Material	Percent Composition
Graphite	0.40
Sodium sulfate	0.50
Calcium carbonate	0.25
Nitroglycerin	9.50
Diphenylamine	1.13
Dibutylphthalate	5.25
Nitrocellulose	82.97

In addition to air emissions, brass shell casings and possibly lead-alloy projectiles would also be expended, some of which would not be retrievable. The brass (70 percent copper and 30 percent zinc) cartridge case encapsulates the propellant charge and supports the bullet projectile. Projectile cartridge types include ball bullets, tracers, and incendiary bullets. The bullet projectile consists of two parts: a copper alloy clad steel metal jacket and a lead alloy core. The core of the ball is composed of a short forward section of steel and a larger rear section of lead/antimony. The metal jacket around the core is normally composed of brass (copper and zinc) or a ductile grade of malleable steel covered with a thin coating of copper (U.S. Air Force, 1997a). Assuming approximately 30 missions, with 1,000–1,500 rounds expended per mission, annual live-fire training would result in about 1,000 pounds of brass from shell casings. The lead-alloy projectile of the 7.62 mm weighs 9.7 grams or .021 pounds. The annual total weight of lead projectiles expended would potentially be about 855 pounds on the Island.

An estimated 60 percent of the brass casings would be retrievable. The chemical input from corroding brass should be insignificant, because brass undergoes slow corrosion, even in salty environments. A slow release of copper and zinc ions would result from brass corrosion.

Soil modeling was conducted to estimate the amount of metals that would result from the use of frangible and standard munitions over time. The Seasonal Soil Compartment Model (SESOIL) was used for this analysis; the model is a one-dimensional, vertical transport integrated screening-level soil compartment tool. The model utilizes site-specific soil, chemical, and

meteorological values as input to obtain chemical concentrations. SESOIL can estimate the rate of migration of chemicals through soils and the concentration of the chemical in soil layers following chemical loading that is instantaneous or continuous.

The criteria used to determine potential impacts as indicated by modeling results were contaminant thresholds or benchmarks identified by the federal government for screening or identifying areas where the potential for contamination exists.

More specifically, USEPA uses these ecological screening benchmarks to identify chemical concentrations in environmental media that are associated with a low probability of unacceptable risk to ecological receptors. The ORNL Environmental Sciences Division developed a comprehensive assembly of screening values, which are presented together with values developed by regulatory agencies for constituents of concern in Table 4-35. The benchmarks are based on conservative endpoints and sensitive ecological effects data and are not meant to be used as cleanup levels, but represent a preliminary screening of site contaminant levels to determine if there is a need to conduct further investigation at sites. Exceedances of the ecological screening values may indicate the need for further evaluation of the potential ecological risks posed in the area. USEPA Region III risk-based concentrations are values used to show the potential risk to human health of residential inhabitants from exposure to levels above criteria. Table 4-35 also lists concentrations of copper, lead, and zinc that are naturally occurring in soil.

Table 4-35. Ecological Benchmark Values and Soil Screening Criteria for Munitions Constituents

	Naturally Occurring in Area Soils[a]	USEPA Region IV Ecological Soil Screening Benchmark[b]	USEPA Region III Risk Based Concentration (Residential)[c]	ORNL Soil Microbe Benchmarks[b]	ORNL Soil Invertebrate Benchmarks[b]	ORNL Soil Plant Benchmarks[b]
	mg/kg					
Copper	7.3	40	3,100	100	50	100
Lead	14.7-18.7	50	400	900	500	50
Tin	ND	53	4,700	2,000	ND	50
Tungsten	ND	400	ND	400	ND	ND
Zinc	26	50	23,000	100	100	50

[a]Boerngen and Shacklette, 1981
[b]ORNL, 2003
[c]USEPA Region III Risk Based Concentration Table, 4/25/2003. http://www.epa.gov/reg3hwmd/risk.
ND = No Data

SESOIL runs were made for the constituents found in both frangible and nonfrangible munitions, based on input of 855 pounds (no projectile collection from target areas) and 133 pounds (87 percent projectile collection). Modeling of contaminant loading was for 1 year and 5 years of munitions use in areas of 1 acre, 5 acres, and 20 acres, since the actual target distribution of the live-fire ranges have not yet been defined. Assuming this alternative is selected and the actual target arrangement is defined, additional modeling may be required to refine the analysis. The assumption used for SESOIL modeling was that the constituents in the rounds were immediately available (i.e., free to move through the environment) once expended. In reality, some time would pass before constituents would be available, but this scenario presents a useful concentration to compare to established screening criteria in lieu of actual site-specific sampling data. Results of SESOIL modeling are presented in Table 4-36. Exceedances are denoted in bold.

Table 4-36. SESOIL Modeling Results of Munitions Composition Constituents in Soil

	SURFACE AREA (acres)											
Constituent[a]	1				5				20			
	MUNITIONS USE (years of loading)											
	1		5		1		5		1		5	
	CONSTITUENT LOADING (pounds)*											
	133	855	133	855	133	855	133	855	133	855	133	855
	Maximum concentration in soil (mg/kg)											
Copper	8.02	**51.7**[b]	**67.1**	**432**	1.62	10.4	13.5	**86.6**	0.0004	0.0026	0.0032	0.0216
Lead	9.63	**62.1**	**80.7**	**520**	1.94	12.4	16.3	**104**	0.0005	0.0031	0.0039	0.0260
Tin	4.43	**60.8**	**79.0**	**509**	1.90	12.2	15.9	**102**	0.0005	0.0030	0.0038	0.0255
Tungsten	10.8	69.7	89.6	586	2.18	14.0	18.3	116	0.0005	0.0035	0.0043	0.0289
Zinc	8.68	**55.9**	**72.7**	**468**	1.75	11.2	14.7	**93.7**	0.0004	0.0028	0.0035	0.0234

[a]Assumes metals from ammunition are immediately dispersed and available for transport.
[b]Boldface indicates exceedance.

Potential impacts from 855 and 133 pounds of rounds expended in a 20-acre area did not exceed either background or soil screening levels (SSLs). Nor were exceedances noted for modeled concentrations in a 5-acre area with 1 year of loading and at 5 years and 133 pounds. However, SSLs were exceeded in a 5-acre area with 855 pounds of annual loading for 5 years. According to the SESOIL model, the greatest exceedances occur within a 1-acre area receiving 133 pounds over 5 years and 855 pounds of rounds annually for 1 to 5 years. All metals, with the exception of tungsten, would exceed one or more benchmarks listed in Table 4-36. Only lead exceeded the RBC for residential exposure from the 5-year, 855-pound modeled concentration, but exceedances for tin, copper, and zinc were also predicted by the model. If lead bullets are expended within 5 acres over a 5-year period, or in a 1-acre area from 1 to 5 years, 87 percent bullet containment is recommended. Depending on the type of munition actually used (i.e., frangible versus lead), periodic soil monitoring for copper, lead, tin, and/or zinc would be required. Similarly, should frangible munitions be expended within 1 acre annually for 5 years, BMPs outlined later in this section would be necessary to negate potential ecological impacts from munitions residue in soil. As long as BMPs are implemented, the chemical materials impacts would not be significant.

Terrestrial wildlife can be exposed to contaminants through multiple pathways; they may drink or swim in contaminated water, ingest contaminated soil and food, and breathe contaminated air. Animals may move between habitats incurring contamination from several spatially discrete sources. Soil ingestion by wildlife could function as a major pathway for the uptake of metals. Cattle, sheep, and swine studies identified soil as the main sources of exposure to contaminants including lead.

Soil may be ingested intentionally or incidentally. Wildlife may intentionally feed on soil and grit to supplement mineral deficiencies and/or to assist in food digestion. Surface soil contains minerals such as sodium, calcium, iron, magnesium, manganese, phosphorus, zinc, and other trace minerals that are required to sustain life processes. Typically, these constituents are derived in adequate quantities from the consumption of plants or animal foods. However, because of seasonal fluctuations or deficiencies in food source mineral content, species may consume mineral-laden soils. Increased demand for calcium or sodium may cause some animals to ingest soil directly. Seed-eating birds ingest soil as a digestion aid. Box turtles, tortoises, and other reptiles are known to intentionally consume soil, possibly for its mineral content (Arthur

and Alldredge, 1979). Animals can incidentally ingest soil while grooming, digging, grazing, and feeding on soil-covered roots or food sources such as mollusks that contain sediment. Some birds gather mud in their beaks for nest building. Wood ducks can ingest high rates of sediment while feeding (USEPA, 1993). Animals that feed extensively on earthworms may have an increased exposure potential because worms ingest soil directly. Earthworms are typically 20 to 30 percent soil. Estimated soil ingestion rates for several species are presented in Table 4-37.

Table 4-37. Estimated Soil and Sediment in Terrestrial Species Diets

Species	Percent Soil in Diet (dry weight)	Rate of Soil Consumption/Food Consumption (kg/d)
Birds		
Wild turkey	9.3	0.0162/0.174
Wood duck	11.0	ND
Shorebirds	10–60	
Feral hog	2.3	
Mammals		
White-tailed deer	<2.0	0.0348
Red fox	2.8	0.0126/0.45
White-footed mouse	<2.0	0.000068/0.0034
Eastern cottontail	6.3	0.015/0.237
Reptiles		
Eastern painted turtle	5.9	ND
Box turtle	4.5	

Sources: USEPA, 1993; Sample and Suter, 1994
ND = no data

Live firing of standard or frangible munitions poses a risk of exposure from various metal alloys to certain species of wildlife, particularly those that feed in close contact with the soil and sediments such as some insects, birds, and wild hogs. Shorebirds, based on their rate of soil ingestion of up to 60 percent, could potentially be affected from metals deposited in their feeding areas. Thus, for SRI live-fire areas, it is important to either locate targets in areas where shorebirds do not feed and/or implement measures to retrieve 87 percent or greater of projectiles spent. Additionally, brass cartridges should be collected to the degree possible. Where possible, deposition of casings and other materials into sensitive species habitats should be avoided.

The following BMPs can be implemented to minimize the potential impacts associated with small arms use on the island.

***Bullet Containment*:** The most effective BMP for managing lead or other heavy metal contamination on outdoor shooting ranges is bullet containment (USEPA, 2001). All containment systems are site-specific and dependent upon installation and maintenance costs. A variety of containment devices can be used, include the following.

- ***Earthen Berms and Backstops.*** Earthen berms and backstops comprise a common system used at shooting ranges, which uses earthen material such as sand and soil located directly behind the target. The backstop is usually 15 to 20 feet high with a steep slope. Reclamation is required to remove lead from soils, as continuous use increases the risk of bullet ricochet and fragmentation (USEPA, 2001).
- ***Sand Traps.*** Sand traps are a variation of the earthen backstop with mounds of sand or soil located directly behind bullet targets. The 15- to 20-foot mounds serve as a backstop that employs a system that contains, collects, and controls lead and contact water. Sand

traps may be located over an impermeable liner to prevent lead from contacting the soil underlying the trap. As with the earthen backstop, traps must be sifted when saturated with bullets. The bullets can then be recycled (USEPA, 2001).

- ***Steel Traps.*** Steel traps vary in design and complexity. The Escalator Trap contains an upward sloping deflection plate that directs bullets into a spiral containment area. The Vertical Swirl Trap is a modular, freestanding trap that funnels the bullets into a vertical aperture in which they spin, decelerate, and then become trapped in a collector container. The Passive Bullet Trap has steel deflection plates that slope upward and downward. Bullets follow their path of deceleration in a round chamber for collection and recycling. Reclamation of lead is easier using steel traps in comparison to sand traps and earthen berms; however, an increase in lead dust and fragmentation should be considered and managed (USEPA, 2001).
- ***Lamella or Rubber Granule Traps.*** The Lamella Trap consists of tightly hanging, vertical strips of rubber with steel backing located behind targets that stops bullets. The bullets are then removed from the rubber. Rubber Granule Traps increase safety by reducing the incidence of back splatter and eliminating lead dust dispersion to the air and soil. Considerations include required additional maintenance; fire threat due to heat from friction created by bullets impacting rubber at high volumes; inability to withstand long-term weather elements; difficult reclamation due to bullets rubber particles melting to lead bullets (USEPA, 2001).
- ***Shock-Absorbing Concrete (SACON) Bullet Traps.*** The SACON is a low-density, fiber-reinforced, foamed concrete bullet trap. Studies at ranges revealed that at 25 meters, the trap contained 87 percent of the bullets. A large portion of the bullet fragments and debris formed a pile in the front of the trap. Exposure of the bullet debris to SACON material resulted in insoluble lead corrosion products. Toxicity Characteristic Leaching Procedure (TCLP) levels were below 5 mg/L, and the weathered material was classified as nonhazardous and disposed of as a solid waste (ESTCP, 1999).

Impacts to Water Quality

Amphibious Assaults: Amphibious landings involve the use of LCACs, LCUs, AAVs, and Zodiac boats at the land-water interface. 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 Santa Rosa Island. The LCU has a seven-foot draft and would be required to stop offshore when waters became too shallow. It is likely to hit bottom sediments and create increases in turbidity. Offloading of vehicles from the LCU and their movement to the shore would also increase water column turbidity. Wave action and resulting turbidity far outweigh the short-term, localized increases in turbidity that would result from LCU landings and offloading. Minimal, short-term water quality impacts are anticipated from LCU landings at Santa Rosa Island, but would return to normal within a day.

Santa Rosa Island may experience AAV landings and returns to the water on both the Gulf and Sound sides of the island, along with lateral movements of the vehicles and cross-island

movements. AAVs would displace large amounts of sand when moving at high rates of speed on the Island and would churn up bottom sediments upon landings and returns. No data were available regarding the actual amount of displacement from an individual AAV; however, the amount may be substantial when considering the number of vehicles that would be operating on the Island during certain missions (e.g., 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. 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. Measures to reduce potential shoreline erosion are covered under the previous section, Impacts to Soils. 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.

Wheeled and tracked vehicle traffic both have the potential to impact water quality in wetlands. Most wheeled vehicle traffic would take place on established roads, but certain operations would require off-road movements. These operations, along with tracked vehicle movements, would strive to avoid wetlands, as detailed in the Wetlands section under Impacts to Sensitive Habitats, Alternative 1, above. Any turbidity caused by vehicle movement through wetlands is expected to be small-scale and temporary in nature, returning to normal within a day.

Impacts to Sensitive Species Habitat

Sea Turtles: Tracked vehicles can be expected to create large, deep ruts as they come ashore. Ruts at the waterline would be removed by wave action and rising tides and are not expected to pose a risk to hatchlings. Ruts created by tracked and wheeled vehicles above the waterline may impede hatchling movement or obscure evidence of sea turtle activity. However, these 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, as described in Appendix E can greatly reduce the potential for adverse impacts to sea turtle habitat.

Unlike the AAV, the LCU is not an amphibious craft and therefore would not come ashore on SRI. Instead, the LCU would maneuver as close to the shoreline as possible while maintaining the minimum required draft below the bow. The craft would then deploy a landing ramp onto the beachfront for exiting vehicles. Because LCUs do not come ashore, any damage done to the sand by the deployment of the landing ramp would occur at the waterline. LCU landings are not expected to produce ruts in the sand; therefore LCU landings are expected to have no effect on sea turtle habitat.

During certain operations, vehicles/craft (e.g., LCACs, AAVs, Zodiacs, wheeled vehicles) may land or be offloaded and then staged on the beachfront during the day and/or night at staging areas proposed for A-2, A-3, A-10, and A-15. Although female sea turtles may be discouraged from nesting where vehicles/craft are left on the beachfront at night, only limited numbers would be left on the beachfront 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. With these avoidance and minimization measures in place, the landing and staging of vehicles on the beachfront at night during sea turtle season is not likely to impact sea turtles.

AAVs may potentially be used in the proposed 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.

Gulf Sturgeon and Critical Habitat: Gulf sturgeon are thought to migrate in Gulf waters offshore of Santa Rosa Island; however, there are no spawning sites, congregation sites, or relocation sites within this area. 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, since sturgeon prefer depths of approximately 6.5 to 13 feet, it is unlikely that sturgeon habitat would be affected. Due to the area affected existing outside of their primary habitat (6.5 to 13 feet) and 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.

Piping Plover and Critical Habitat: Within property administered by Eglin, critical habitat is situated on the north shore of SRI near Test Site A-18. One LCAC crossing area would be designated approximately 0.75 mile from plover critical habitat, and one maneuver area would be located just south of the plover habitat, but no impacts to the habitat are anticipated because LCACs would avoid plover critical habitat. Activities associated with amphibious landings would not occur in or near piping plover critical habitat.

4.4.5 Habitat Alteration Summary

The primary issues evaluated in this analysis were potential alterations to habitats from troop movements, vehicle movements, amphibious craft movements, and surf zone detonations. A habitat alteration summary for all alternatives is presented in Table 4-38.

Habitat Alteration Management Recommendations

Specific mission-related management requirements and mitigations have been outlined in previous NEPA documentation and ESA and MMPA consultations. Pertinent documents associated with identified mission activities have been identified earlier in this section under each alternative. The management requirements/mitigations identified for these mission activities would apply to the alternatives and associated mission activities described in this document. The following are general management recommendations for minimizing potential impacts to sensitive habitats from operations associated with the Action Alternatives. Specific, mission related management requirements/mitigations can be reviewed in associated NEPA or consultation documentation.

Table 4-38. Summary of Potential Habitat Alteration Consequences

<table>
<tr><th rowspan="2">Resource Area</th><th colspan="4">Alternative</th></tr>
<tr><th>No Action</th><th>1</th><th>2</th><th>3</th></tr>
<tr><td>Coastal Protection Areas</td><td rowspan="12">A</td><td colspan="2" rowspan="8">○</td><td>○</td></tr>
<tr><td>Beach Dunes</td><td rowspan="2">λ</td></tr>
<tr><td>Wetlands</td></tr>
<tr><td>Essential Fish Habitat</td><td rowspan="3">○</td></tr>
<tr><td>Floodplains/CZMA</td></tr>
<tr><td>Water Quality</td></tr>
<tr><td>Soils</td><td rowspan="2">λ</td></tr>
<tr><td>Sea Turtle Habitat</td><td colspan="2">λ</td></tr>
<tr><td>Gulf Sturgeon Habitat</td><td colspan="2" rowspan="4">○</td><td rowspan="4">○</td></tr>
<tr><td>Piping Plover Habitat</td></tr>
<tr><td>Shorebird/Wading Bird Habitat</td></tr>
<tr><td>Beach Mouse Habitat</td></tr>
</table>

A = Assessed as needed based on proponent need through 813 process
○ = Minimal Potential Impacts, Potential Minor Constraints/Considerations Recommended
λ = Potential Impacts, Constraints Necessary

Sensitive Habitats/Water Quality/Soils

To minimize impacts to Coastal Protection Areas, beach dunes, wetlands, floodplains, water quality, soils, and sensitive species habitats:

- Eglin works with constituents to schedule events in locations that reduce potential impacts to habitats of listed species and maintains the integrity of the barrier island.
- Access routes must be approved by Eglin NRB.
- For recurrent activities over the course of several days or weeks, only a portion of a movement area is used for each event. For recurrent activities over the course of several years, areas used every year are rotated to decrease potential for impacts to sensitive habitats.
- LCACs would avoid vegetated areas to the greatest extent practical.
- Vehicles would remain on existing roads when possible.
- Shoreline site improvements and grading would adhere to best management practices (e.g., shoreline stabilization techniques such as silt curtains) to minimize erosion during construction activities.
- Sand dunes greater than 5 feet in height and large sea oat clumps would be avoided by troop and vehicular traffic.
- Maneuver around wetlands whenever possible for all activities on foot and by vehicle. If a vehicle operator is not sure whether an area is a wetland, then he would move to higher ground.
- Avoid digging near water bodies and in wetland and floodplain areas.
- Capture and properly dispose of wastewater from field kitchens.
- Limit the size of vehicular movement corridors to the minimum necessary for the mission.
- Limit vehicular movement to as close to the waterline as possible and at least 50 feet below the primary dune line.

- Mark landing corridors so as to be easily distinguished by the operators of amphibious landing vehicles/craft.
- To the extent practicable, stage vehicles and watercraft at water's edge. Whenever it is necessary to stage vehicles on the beachfront, install silt screens around the base of the vehicles.
- During sea turtle season, remove all ruts deeper than 2 inches created during daytime operations before sunset. Remove all such ruts created during night operations immediately following the operation completion.
- Avoid seagrass beds when possible.
- Avoid Coastal Protection Areas when possible.
- To the extent practicable, minimize lighting associated with mission activities 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, must use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible hand-held lights and lighting on equipment at night.
- Vehicle/equipment access is restricted in untreated areas with known invasive plant problems.
- When possible, vehicles/equipment are washed before transport onto SRI to avoid introduction of invasive plants.
- To the extent possible, mission activities are limited to areas away from designated piping plover critical habitat.
- When piping plovers are documented in areas where an activity is occurring, the area is marked and the habitat protected. Activities are adjusted accordingly (e.g., relocated away from the area to reduce disturbance).
- Efforts should be made to minimize the likelihood of man-induced wildfire on the Island. If wildfires are started near buildings or other structures, they should be contained as quickly as possible.
- Remove equipment and debris from the mission activity area within 24 hours following completion of the event.
- Use frangible munitions when possible.
- Use "green" munitions when possible.
- Employ bullet containment systems at live fire areas.

4.5 LAND AND WATER USE/RESTRICTED ACCESS

Restricted access pertains to the temporary closure of test areas, interstitial areas, public roads, or airspace because of mission activities. The purpose of restricting access to the public during these times is to ensure their safety while maintaining mission integrity. Receptors potentially impacted would include the military and the public desiring to use roads, test areas, recreational areas, or airspace. Restricted access impacts would be associated with mission activities at SRI involving the detonation of live munitions, LCAC training/testing, and other testing missions.

Testing and training on SRI and in the Gulf near the Island requires control of the airspace, water, and land that are part of the mission scenario. Access restriction ensures safety to nonparticipants and protects mission integrity. Specifically, military testing and training can be dangerous to anyone not directly participating in the activity. Conversely, external actors can adversely impact training and testing safety and control. For each military training activity on SRI, the Eglin AFB Safety Office identifies potential safety issues, many of which are associated with the development of safety footprints. This footprint determines if any access restriction is warranted and the extent of the restriction. Although it is not further discussed in this document, access restrictions limit unrelated military activities and movements. Restricted access impacts are:

- Airspace restrictions to nonparticipating aircraft (not covered in this document).
- Temporary closure of recreation areas to public access.
- Restricted, Prohibited, and Danger areas in the surf zone, Intracoastal Waterway, or the Gulf of Mexico.
- Temporary public road closures.

Limits on public access to air, recreation areas, waterways, and roads create nuisance and can impact the regional economy. Airspace restrictions are coordinated with the Federal Aviation Authority. Eglin AFB has the authority to restrict access to its property for any testing and training missions. Restrictions impacting boating on the inland waterway and/or the near shore area of the Gulf of Mexico are coordinated with the U.S. Coast Guard, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. Road closings are coordinated through the respective County Sheriffs and the Florida Department of Transportation. In each of these processes, economic impacts are considered against military necessity.

Airspace restrictions are not covered in this document because they have been adequately addressed in the *Overland Air Operations PEA* (U.S. Air Force, 1998).

The western portion of Eglin AFB SRI property is closed to public access and recreation. Section 3.5.2 of this document describes the eastern 4-mile beach segment of SRI, which allows limited public access. It is a valued tourist destination. However, the landward extent of Air Force-owned property on Santa Rosa Island is the mean high-water line. The general public understands that Eglin AFB controls this area and permits recreational activities when military requirements allow. If beach closures were increased by a large amount, they could impact the local tourism industry, but Eglin is extremely sensitive to this potential and would take great efforts to avoid popular tourist seasons and weekends. Activities in the water that are affected by SRI access restrictions include commercial fishing, commercial shipping, and recreational watercraft. Although the quantity of private recreational boats significantly exceeds the number of commercial craft in the SRI area, waterway restrictions on shipping and commercial fishing create the greatest potential economic impacts regionally.

Road closures create a significant nuisance to the local population and could impact the local economy if they became too frequent. Hwy 98 runs parallel to the north of the western segment and through the eastern segment of SRI. Commuters and tourists currently experience delays because of traffic quantity. Regular additional delays may impact the value of commercial and residential property along Hwy 98 and its secondary road network. Tourists experiencing more

than one significant delay during a visit to the area may view the area as less desirable and elect to spend vacations elsewhere.

Environmental Analysis

Analysis of restricted access must first examine the overlap of use of state recreational and navigable water areas between the military and the public to determine whether missions significantly prevent the use of these areas by the public. Peak recreational public use of the area waters occurs during the summer months with highest use during the middle of the day. Commercial transportation through the Gulf is relatively steady throughout the year, while commercial fishing interests are usually located in areas not used for military training.

Vessel traffic through Gulf nearshore test areas may be slightly delayed due to testing. Currently, restricted areas, prohibited areas, and danger zones in the nearshore areas of the Gulf are outlined on nautical charts and are described in the *U.S. Coast Pilot*, Vol. 5 (U.S. Department of Commerce, 1996). Controlled Firing Areas (CFAs) allow for hazardous activities within an airspace but are not charted since they do not result in course changes by nonparticipating aircraft.

Definitions as they appear in the *U.S. Coast Pilot* are:

> ***Danger Zone –*** *A defined water area (or areas) used for target practice, bombing or rocket firing, or other especially hazardous operations, normally for the armed forces. The danger zones may be closed to the public on a full-time or intermittent basis as stated in the regulations.*
>
> ***Restricted Area*** *– A defined water area for the purpose of prohibiting or limiting public access to the area. Restricted areas generally provide security for Government property and/or protection to the public from the risks of damage or injury arising from the Government's use of that area.*
>
> *"Danger zones and restricted areas are to provide for public access to the area to the maximum extent practicable" and "the authority to prescribe danger zone and restricted area regulations must be exercised so as not to unreasonably interfere with or restrict the food fishing industry. Whenever the proposed establishment of a danger zone or restricted area may affect fishing operations, the U.S. CEC District Engineer will consult with the Regional Director, U.S. Fish and Wildlife Service, Department of the Interior and the Regional Director, National Marine Fisheries Service, National Oceanic and Atmospheric Administration."*
>
> ***Controlled Firing Area*** *– A defined airspace block that contains activities that would be potentially hazardous to nonparticipating aircraft. Activities are immediately suspended if spotter aircraft, radar, or ground lookouts identify an aircraft approaching the area.*

CFAs must be renewed by the Federal Aviation Administration (FAA) every two years (U.S. Air Force, 2001).

4.5.1 No Action Alternative

Under the No Action Alternative, the status quo would be maintained, and environmental analysis would be conducted for each mission on an as-needed basis, depending on whether or not similar mission activities have been previously analyzed and approved under the EIAP process. Because of the dynamic nature of the Eglin AFB test and training regime, it is difficult to anticipate the numbers and types of missions that may involve the use of SRI. Unlike the other action alternatives, where a mission use plan is outlined and specific actions can be directed to specific locations and a qualitative analysis can be conducted, by definition the No Action Alternative allows for the potential for an activity to be conducted anywhere on the Island (provided the proper analysis is conducted). A general discussion of potential impacts associated with the No Action Alternative for planning purposes is provided below.

Recreation Area User Impacts

Current procedures require a great deal of resources to implement beach access restrictions for military operations on the eastern 4-mile SRI beach. Parallel parking is possible along the 4-mile stretch of Hwy 98. Pedestrian beachgoers can access the beach at multiple locations along this stretch. To prevent accidental entry into temporarily restricted areas during missions, an increased number of "Posted" signs and active observation of the entire 4-mile stretch would be necessary. Additionally, the City of Destin has a five-year lease with Eglin to use the western jetty for Fourth of July fireworks. The lease was conditional upon implementing access controls for the dunes and adjacent shorebird nesting areas.

Boating, Shipping, Fishing Impacts

The current *U.S. Coast Pilot 5* lists two locations related to SRI operations, (Figure 4-2). These zones allow the U.S. Air Force to restrict or prohibit the entry of vessels into these zones during times of testing operations. Stipulations for frequency of closure of the restricted area are identified as not more than twice weekly for one hour at a time. The Base Commander is authorized to enforce the regulations of the *U.S. Coast Pilot 5* pertaining to the restricted and prohibited areas of the Gulf near Santa Rosa Island (33 CFR sections 334.710 and 334.730).

Controlled firing areas would not affect restricted access since they do not require aircraft or vessels to deviate from course. Activation and use of controlled firing areas occurs only when the area is clear of vessels and aircraft.

Traffic Impacts

When current military operations on SRI require traffic slowdowns closure of Hwy 98 or other public roads, Eglin AFB notifies the sheriffs department. For temporary closure of Hwy 98, the Florida Department of Transportation would be contacted. The *Amphibious Ready Group/Marine Expeditionary Unit Readiness Training Environmental Assessment* (U.S. Air Force, 2003) describes the Eglin AFB road closing procedures and impacts.

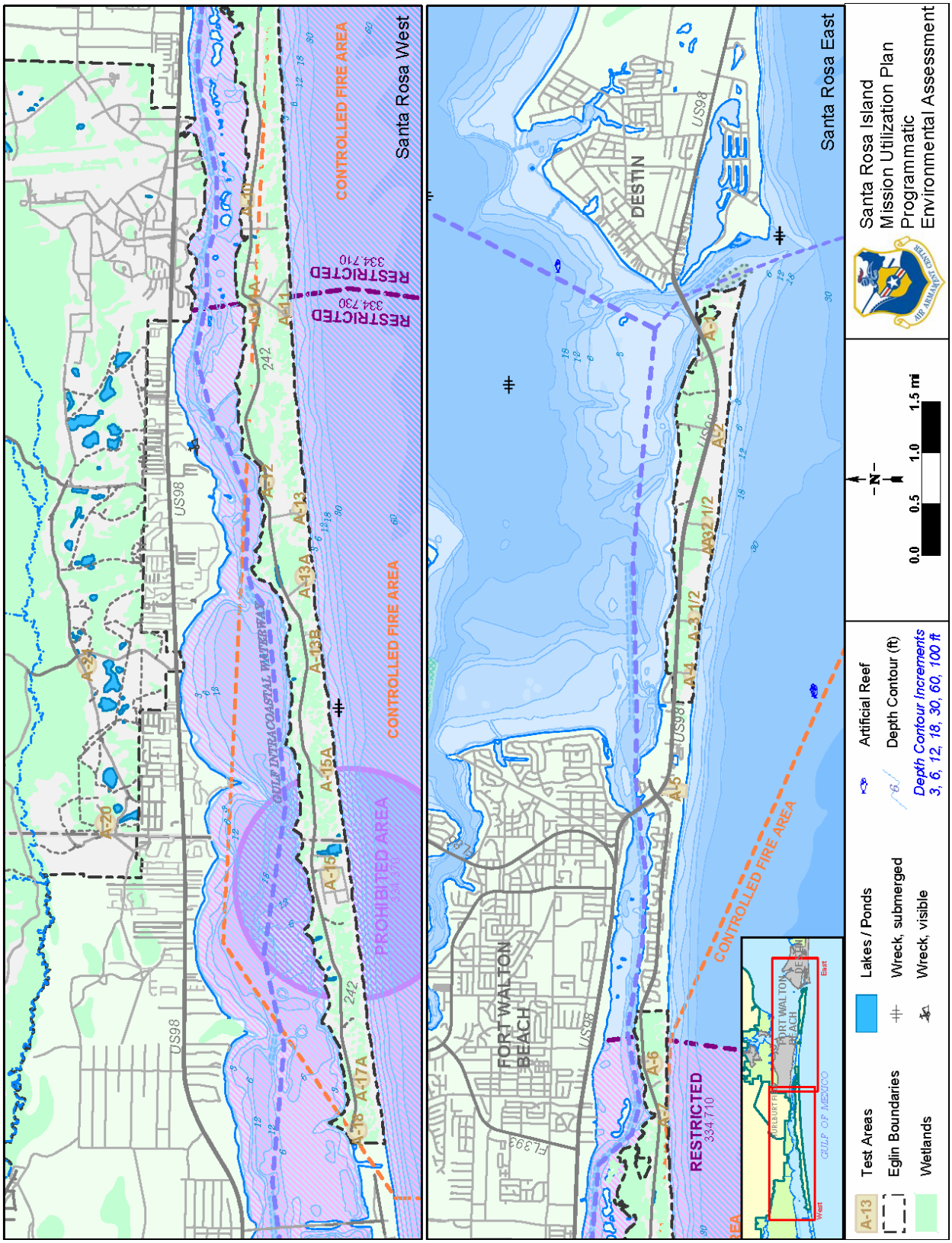

Figure 4-2. Potential Restricted Access Areas Associated With SRI Mission Activities

Closure of a primary road would be a substantial nuisance. For a traffic delay nuisance to reach a level of economic impact, it must be of sufficient duration to motivate tourists and/or business to take the business elsewhere. To ensure that the nuisance is minimized below economic impacts, a number of actions must be taken. An effective public awareness campaign softens the impact of the road closure. The campaign should reach the population to the greatest extent possible with a clear message accurately explaining the time and reasons for the closure. Closure duration should be minimal. Road closures would be scheduled to avoid tourist season. Visitors do not generally pay attention to local news venues; therefore many would not hear the most aggressive public awareness campaigns. Additionally, tourist season brings a substantial traffic surge to Hwy 98. Secondarily, road closure times will avoid high traffic periods such as the morning or evening commute. The last but weightiest factor is the closure frequency. If a road closure were to become a frequent occurrence, those impacted would begin to avoid the region whether a closure is scheduled or not. If this occurred, adverse economic impacts would be likely.

4.5.2 Alternative 1

Under Alternative 1, the activities that would potentially create restricted access impacts and respective dedicated locations are shown in Table 4-39. Similar activities have either occurred at these locations in the past or are planned for the future and have been analyzed and approved under other NEPA or ESA Consultation documents. Airspace restrictions are not covered in this document, as they have been addressed in the *Overland Air Operations PEA* (U.S. Air Force, 1998).

Table 4-39. Alternative 1 Restricted Access-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation
	Live	Inert		
Current				
S/A Missile Testing	Y		TA A-15	Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement—Eglin Gulf Test Range (U.S. Air Force, 1998e) Environmental Assessment for Projected PATRIOT Testing (5-year Plan) (U.S. Air Force, 2002) and Biological Assessment (U.S. Air Force, 2002f)
LCAC Crossings	N/A		~TA A-13B	ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c)

Restricted Access Measures

Alternative 1 would also involve establishing the following restricted access measures on the eastern portion of SRI.

- Maintain existing fencing along the south side of Hwy 98 bordering Eglin property.
- Maintain public access at Destin Bridge and Beasley Park as it is today.
- Post signs at public access points advising beachgoers of potential restriction of beach access during time of mission activity as a public safety and mission integrity measure.
- Air Force and other authorized personnel will continue to patrol the USAF Island property to maintain mission integrity, protect public safety and Air Force property, and execute the Air Force environmental stewardship mission.

Under Alternative 1, a dedicated DoD Mission Use Plan would be established qualifying the above-listed locations for the associated activities. These activities would be approved at the respective locations, and mission-by-mission analysis and approval would not be required in the future for such activities.

Under Alternative 1, the following activities would not be associated with dedicated sites and would therefore require mission-by-mission approval as with the No Action Alternative.

- Surf zone testing and training
- Small boat obscurant testing
- Live fire activities
- Expanded Special Operations training
- Amphibious assaults
- Expanded LCAC operations

These activities would be evaluated through the EIAP process on a case-by-case basis and appropriate environmental management actions (i.e., consultations, permits, etc.) would be implemented if deemed necessary.

The following activities occurring under Alternative 1 are not likely to create any restricted access impacts to the public.

- Electronic Systems/ECM Testing/Training
- OA-HITL Testing and Advanced Usage
- Ground Testing
- Ground Training
- Personnel/Equipment Drops and Extractions

Environmental Analysis

Recreation Area User Impacts

None of the Mission Use Plan activities alter the impacts of recreational users any differently than the No Action Alternative. The SRI 4-mile eastern beach is free of any of the Alternative 1 designated Mission Use Plan activities.

Boating, Shipping, Fishing Impacts

The establishment of a Mission Use Plan for LCAC procedures would not change the frequency of closures or access restrictions. Closures would not exceed the number specified in the current *U.S. Coast Pilot 5*. A Mission Use Plan would enable the development of regular procedures. Regular, understandable procedures permit the commercial shipping industry to better plan for access restrictions, and subsequently avoid delay costs. Potential impacts to the fishing industry would be considered and mitigated prior to the establishment of any new danger zones or restricted areas. Any changes proposed by Alternative 1 would have minimal impacts on recreational boater and would not adversely impact the local economy.

Traffic Impacts

Alternative 1 does not increase the frequency of road closures. It may however, standardize closure procedures and therefore reduce closure durations. Therefore no negative traffic impacts would occur from this alternative.

4.5.3 Alternative 2

Alternative 2 includes all of the proposals in Alternative 1, and it expands the Mission Use Plan to establish Surf Zone Test Areas (SZTA) on SRI (Table 4-40).

Table 4-40. Alternative 2 Restricted Access-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation
	Live	Inert		
Surf Zone Testing/Training	Y		TA A-15, TA A-10, ~TA A-2	Final Environmental Assessment for Coastal Testing of the SABRE and DET Systems(U.S. Air Force, 1999) Final Biological Assessment for Testing of the SABRE System, the DET System, MK-82 General Purpose Bombs, and the MK5 Mine Clearance System, Santa Rosa Island (U.S. Air Force, 1998c) Final Environmental Assessment for Testing of the MK-82 General Purpose Bombs and MK-5 Mine Clearance System (U.S. Air Force, 1999a) Naval Explosive Ordnance Disposal School Training Operations Biological Assessment (U.S. Air Force, 2004)

Specific descriptions of SZTA use and three proposed locations are in Section 2.2.3 of this document. There is one proposed SZTA on the eastern section of SRI between Test Areas A-2 and A-3. In the western section, one proposed SZTA is centered on Test Area 10 and the other on Test Area A-15. The proposed SZTAs would be used to fire and detonate various mine clearing line charges in the surf zone. The western SZTAs safety fans are adequate for training on any fully developed munitions. For testing rocket and charge combinations in development, a much deeper safety fan may be required. In this case the proposed eastern SZTA would be used.

Recreation Area User Impacts

The two proposed western SZTAs have no impact on recreation area use. The third proposed SZTA lies at the mid point of the SRI eastern beach. Detonations in this eastern SZTA would require restricting public access in the SZTA safety fan. It is possible that the entire 4-mile eastern SRI beach would be closed during STZA detonations. With three SZTAs, the use of the eastern portion could be scheduled to avoid high beach use times. The frequency is not expected to be often enough to adversely impact area tourism or other economic base industries.

Boating, Shipping, Fishing Impacts

No additional waterway control measures would be needed for the two western SZTAs. The current *US Coast Pilot 5* lists two areas that Eglin AFB has the authority to restrict from public vessels; both western SZTAs lie within the range of these restrictions. The frequency of use of the western SZTAs would not exceed the limits codified in 33 CFR sections 334.710 and 334.730.

To establish an SZTA between Test Sites A-3 and A-2, much more coordination would be required. Eglin AFB does not currently have the authority to restrict vessels in the area. A new restricted area would have to be established to get that authority. The process to get that authority would consider impacts to commercial fishing, shipping, and recreational boating.

Traffic Impacts

The two proposed western SZTAs have no impact on public roads.

Use of the third proposed SZTA would require closure of Hwy 98 on SRI. Closure of this primary road could be a substantial nuisance. The 5-mile stretch of Hwy 98 between Fort Walton Beach and Destin is the primary route for tourists and commuters between the two cities. The only bypass is 25 miles through Niceville. The *Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) Readiness Training Environmental Assessment*, (U.S. Air Force, 2003) estimated traffic impacts for a different section of Hwy 98. Although the traffic patterns vary, the level of service is similar. In this travel impact analysis, a 15-minute closure would result in an initial traffic backup of 1 mile in length, which would take approximately 30 minutes to clear. These calculations were made based on an average off-peak period. Closures of this magnitude or greater, if occurring frequently, could potentially cause some adverse impacts to the local economy. However, actions requiring this type of closure would only occur a maximum of twice a year, and would take place during off-peak times (i.e., holidays and tourist season). As a result, it is unlikely that any substantial adverse impacts aside from temporary inconvenience would result.

4.5.4 Alternative 3

Alternative 3 includes all of the proposals in Alternatives 1 and 2, and it expands the Mission Use Plan to establish Special Operations/LCAC Live Fire Training Areas (LFTA) on SRI (Table 4-41).

Table 4-41. Alternative 3 Restricted Access-Related Mission Activities and Locations

Activity	Ordnance Type		Location	Associated NEPA/ESA Section 7 Documentation for Similar/Related Actions
	Live	Inert		
Expanded Special Ops Training	Y		Various Locations (Figure 2-6)	ARG/MEU Environmental Assessment (U.S. Air Force, 2003) and Biological Assessment – USFWS (U.S. Air Force, 2003a) – NMFS (U.S. Air Force, 2003c)
Amphibious Assaults	N/A			
Expanded LCAC Training/Maneuvers				

A specific description of Expanded Special Ops Training and LCAC LFTA/Maneuver Areas and the proposed locations are in Chapter 2 of this document. The primary LFTA activity relevant to access restriction is the firing of small arms. Chapter 2 states that only frangible ammunition would be used on these ranges. The range for frangible ammunition is only a fraction of that of standard bullets; therefore they are appropriate for use in areas with limited safety zones.

The U.S. military has approved two frangible ammunition types for military training exercises: 5.56 mm for individual weapons and 7.62 for crew served machine guns. The safety range fans for this ammunition would depend on the location of firing points and targets. Specifically, the orientation of possible fires is a primary concern. Frangible ammunition fragments upon its first collision. It is designed to not cause unpredictable ricochet or secondary shrapnel missiles. The effect of this design reduces its effective range and the maximum danger zone.

Recreation Area User Impacts

The two proposed western LFTAs have no impact on Recreation Area use. Eglin AFB would have to restrict access to the eastern SRI beach for use of the third proposed LFTA. The extent of restriction would depend on the weapons used, the firing points/limits, and the orientation of fires. Live fire training exercises can include multiple targets and range fans. It is likely that the entire extent of the eastern SRI beach would be closed during the conduct of any small arms live fire training event.

With three LFTAs, the use of the proposed eastern site could be scheduled to avoid beach use times. The frequency of closure is not expected to be significant enough to adversely impact the area tourism or other economic base industries.

Boating, Shipping, Fishing Impacts

Alternative 3 impacts are similar to Alternative 2. No additional water control measures would be needed for the two western LFTAs. Whether the range is used as a SZTA, a LFTA, or for other training or testing, waterway closures cannot exceed the frequency established in 33 CFR sections 334.710 and 334.730 (See Appendix A) and published in *US Coast Pilot 5*. Similarly, to establish a LFTA between Test Sites A-2 and A-3, Eglin AFB must establish a new restricted area. The development of a new restricted area would include all potential uses including small arms fires and surf zone testing.

Traffic Impacts

The two proposed western LFTAs have no known potential impact on public roads. Use of the third proposed LFTA between A-2 and A-3 may require occasional closure of Hwy 98 on SRI if small arms weapons firing is directed north from the Gulf. Closure of this primary road could be a substantial nuisance as explained in Alternative 2.

The unique and relevant issue for Alternative 3 would be whether road closures would increase as a result of the addition of an LCAC crossing area and SZTA to the eastern SRI mission use plan. It is likely that a Mission Use Plan including a SZTA and LFTA between A-2 and A-3 may entice more military use of SRI. Subsequently, Hwy 98 closures would be expected to increase. To mitigate the impacts on local economies, Eglin AFB should consult with local governments and representatives of the economy on maximum closure frequency.

4.5.5 Restricted Access Summary

Current use of the eastern portion of SRI requires a great deal of planning and resources under the No Action Alternative. This planning is a significant workload to Eglin AFB as well as to those that experience an unpredictable access restriction. Alternative 1 offers two elements that reduce the nuisance. A Mission Use Plan for current basic activities would reduce the episodic planning for likely events.

Alternatives 2 and 3 add two enhanced capabilities to the SRI Mission Use Plan (Table 4-42). The inclusion of these capabilities would streamline the planning for these operations. This efficiency may increase demand on SRI. Subsequently, this efficiency may increase the closure frequency of Hwy 98, public access to the eastern SRI beach, and boating/shipping/fishing areas. Increases in the closure frequency may potentially have adverse impacts on the local economy.

Table 4-42. Summary of Restricted Access Impacts to Military and Public Areas Under All Alternatives

Mission Activity	Ammunition, Weapon, or System	Associated Safety Footprint	Area Affected	Maximum Potential Duration of Closure
Theater Missile S/A testing	Patriot	TBD[1]	Coast Pilot 5 Restricted Areas	6 hours
SZTA at A-15 or A-10	SABRE Segment (23 Charge) or DET Segment (11'x 60') with Mines	300 acres	*Coast Pilot 5* Restricted Areas	2 hours
SZTA between A-2 and A-3	SABRE Segment (23 Charge) or DET Segment (11'x60') with Mines	300 acres	SRI Beach	2 hours
			TBD Waterway Restricted Area	2 hours
			Hwy 98	30 minutes
	MK-22 Mod 4 Rocket (SABRE/DET)	TBD[1]	SRI Beach	12 hours
			TBD Waterway Restricted Area	2 hours
			Hwy 98	30 minutes
	Developmental Line Charge with Rocket	TBD[1]	SRI Beach	12 hours
			TBD Waterway Restricted Area	2 hours
			Hwy 98	30 minutes
LFTA at A-15	5.56 mm frangible ammunition	630 acres[2]	*Coast Pilot 5* Restricted Areas	2 hours
	5.56 mm & 7.62 mm frangible ammunition	1300 acres[3]		
LFTA at A-10	5.56 mm frangible ammunition	450 acres[2]		
	5.56 mm & 7.62 mm frangible ammunition	1000 acres[3]		
LFTA between A-2 and A-3	5.56 mm frangible ammunition	710 acres[2]	SRI Beach	24 hours
			TBD Waterway Restricted Area	4 hours
			Hwy 98	30 minutes
	5.56 mm & 7.62 mm frangible ammunition	1500 acres[3]	SRI Beach	24 hours
			TBD Waterway Restricted Area	4 hours
			Hwy 98	30 minutes

[1] Too many variables to solidify a specific foot print
[2] Acreage is based on area of potential firing points and 820' range for 5.56 mm frangible ammunition
[3] Acreage is based on area of potential firing points and 1969' range for 7.62 mm frangible ammunition

Live fire training at the LFTA between A-2 and A-3 would only occur if other areas were unavailable due to various circumstances (e.g., mission conflicts, etc.); however, this is not expected to occur very often. As a result, it is likely that the LFTA between A-2 and A-3 will be only sparingly. Also, the 24-hour period represents the maximum time that the beach could be closed to pedestrian traffic. The actual time of closure would depend on the length of the mission activity. A 24-hour closure would be an infrequent occurrence.

Restricted Access Impact Management Recommendations

To implement a Mission Use Plan with the capabilities outlined in Alternatives 2 and 3, Eglin AFB must develop a new restricted zone in the Gulf of Mexico and Choctawhatchee Bay in the vicinity of A-2 to A-3. A Mission Use Plan for Alternatives 2 and 3 should include frequency constraints for access restrictions. It is important that representatives of the impacted public, local business, and other stakeholders have the ability to participate in the development of this policy.

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APPENDIX A

RELEVANT AND PERTINENT LAWS, REGULATIONS, AND POLICIES

RELEVANT AND PERTINENT LAWS, REGULATIONS, AND POLICIES

The Santa Rosa Island Programmatic Environmental Assessment was prepared with consideration and compliance of relevant and pertinent environmental laws, regulations, and policies. This section includes federal executive orders and laws; Department of Defense (DoD) directives and instructions; Air Force instructions (AFI) and policy directives; and Florida state statutes and administrative codes. This list has been compiled and limited to include the most relevant laws, regulations, and policies that are pertinent to the specific mission activities defined in this document. It is further recognized that additional laws and regulations may exist and will be included with subsequent updates.

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.

Air Force Instruction 32-7061; 24-Jan-95; The Environmental Impact Analysis Process; This Instruction 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; 1996; 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; 1996; Florida Air and Water Pollution Control Act; Regulates air pollution within the state.

F.A.C. Chap. 62-204; 1996; Florida State Implementation Plan, with Ambient Air Quality Standards and PSD Program; Establishes state air quality standards and requirements for maintaining compliance with NAAQS.

F.A.C. Chap. 62-213; 1996; 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-Supp; 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 three and 12 nautical miles from the U.S. coast.

Land Resources

16 USC 670a to 670o; 1997-Supp; 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. The Air Force is to manage the natural resources of its reservations to provide for sustained multipurpose use and public use.

USC 1701 et seq., (Public Law 94-579; 1997-Supp; Federal Land Policy and Management Act of 1976 (FLPMA); Provides that the Secretary 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.

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; 1997-Supp; 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-Supp; Controlling Aircraft Noise and Sonic Boom; Provides that the FAA 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 two decibels (dBs) or more as compared to the noise contour map in the most recent AICUZ study.

Water Resources

33 USC 1251 et seq.; 1997-Supp; Clean Water Act (CWA) (Federal 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.

42 USC 300f et seq.; 1997-Supp; Safe Drinking Water Act (SDWA); 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 groundwater 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 groundwater resources contaminated with hazardous substances.

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 32-7041; 13-May-94; 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.

Florida Statutes Chap. 403, Part I; Florida Air and Water Pollution Control Act; Establishes the regulatory system for water resources in Florida.

Biological Resources

Animal Resources

16 USC 703 - 712; 1997-Supp; 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 Department of the Interior for taking a listed migratory bird.

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.

Threatened and Endangered Species

16 USC 1531 to 1544-16 USC 1536(a); 1997-Supp; 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 450; 1996; 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; 1996; 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.

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.

Executive Order 13112; 3 Feb 99; Invasive Species. Requires Federal agencies to identify actions that may affect the status of invasive species and to use appropriate programs and authorities to prevent and control invasive species introductions.

Anthropogenic Resources

Hazardous Materials

7 USC 136 et seq., Public Law 92-516; 1997-Supp; 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 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-Supp; 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; 1995; 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 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 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; 12-May-94; 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; USEPA 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.

10 CFR Part 20; 1997; Nuclear Regulatory Commission; Standards for Protection Against Radiation; Establishes survey and monitoring protocols, as well as occupational dose limits, for radioactive materials.

Air Force Instruction 13-212 Vol. I; 1-Sept-00; Test and Training Ranges; Establishes policy and procedures for the use of Depleted Uranium (DU) by Air Force units.

Air Force Instruction 40-201; 1-Sept-00; Managing Radioactive Materials in the U.S. Air Force; Establishes how Air Force employees and activities acquire, receive, store, distribute, use, transfer, or dispose of any item or part that contains radioactive material.

Cultural Resources

10 USC 2701 note, Public Law 103-139; 1997-Supp; 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-Supp; 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-Supp; Archaeological and Historic Preservation Act of 1974 (AHPA); Directs federal agencies to give notice to the Secretary 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 Secretary may undertake preservation.

16 USC 470aa-470mm, Public Law 96-95; 1997-Supp; Archaeological Resources Protection Act of 1979 (ARPA); Establishes permit requirements for archaeological investigations and ensures protection and preservation of archaeological sites on federal property.

16 USC 470 to 470w-6-16 USC 470f, 470h-2; 1997-Supp; 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-Supp; 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; 1994; 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; 1996; 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; 1996; 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; 1995; 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 U.S. Air Force, 1994; 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.

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APPENDIX B

MANAGEMENT PRACTICES

PROPOSED BEST MANAGEMENT PRACTICES
SRI - BASELINE LEVEL OF ACTIVITY

In addition to those BMPs ascribed to mission activities through the AFF 813 process, the following BMPs should be employed for all activities occurring on SRI.

- A restriction of a maximum of 140 dB 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.
- Live fire is restricted to designated areas. Blank ammunition use and pyrotechnics may be permitted according to test directive (described in individual test directives).
- Areas in which small arms with blank ammunition are used must be policed to pick up debris. Spent cartridges are turned in to be recycled (described in individual test directives).
- The use of all pyrotechnic devices will be under the supervision of qualified personnel (described in individual test directives).
- Pyrotechnic devices that dud will not be disturbed, but will be flagged. Explosive Ordnance Disposal (EOD) will 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.
- Clean-up of debris is mandatory (as described in individual test directives).
- Cultural Resource discoveries must be reported immediately to 96 CEG/CEVH (as directed in individual test directives).
- Follow Regulations on Debris and Hazardous Materials for Cleanup: Cleanup of the test site debris and hazardous materials should be conducted according to regulations.
- Monitoring the Test Area: A monitoring plan should be developed to answer specific questions regarding the impact of the proposed testing. The area of the test site should be monitored for all possible areas of impact. The monitoring should include, but not be limited to, chemical analysis of soils, groundwater monitoring, surface water monitoring, and endangered species surveys.
- Report violations of any recreation rules to the Natural Resources Section or the security police.
- Ensure that all military activities are in compliance with the hunting, trapping, and fishing regulations established by the Natural Resources Section and the Florida Fish and

Wildlife Conservation Commission (FWC), unless specific authorization is granted by the Natural Resources Section and the FWC.

- Wheeled vehicles will keep to existing trails/roads (described in individual test directives) unless there is special authority to use nonexisting trails/roads.
- Any archaeological artifacts discovered shall be left in place and the location reported immediately to 96 CEG/CEVH (described in individual test directives).
- All trenches must be filled immediately after use.
- Native American artifacts of any kind (e.g., arrowheads and pottery) will be promptly reported to the Environmental Management Division at Eglin AFB so that the area will be marked.
- Shoreline stabilization actions should be taken at the edges of splash points to minimize potential erosion, such as planting of vegetation (primarily on the Sound side of the Island).
- Report sightings and/or injuries to any federally listed species to 96 CEG/CEVSN.

APPENDIX C

SANTA ROSA ISLAND
AFFECTED ENVIRONMENT SUPPORTING INFORMATION

SRI AFFECTED ENVIRONMENT SUPPORTING INFORMATION

SENSITIVE SPECIES

Sea Turtles

Of the five species of marine turtles found in the Gulf of Mexico, two species are known to nest on SRI beaches. These species are the Atlantic green turtle and the Atlantic loggerhead turtle. However, the majority of nests on SRI are from loggerhead sea turtles. In June 2000, leatherback nesting activity was documented for the first time in Okaloosa County, on Eglin's portion of SRI (Miller, personal communication, 2000). Eglin may have had a Kemp's ridley nest on SRI for the first time in 2004; eggs have been sent off for DNA testing (Miller, 2004). The USFWS oversees the sea turtle protection and conservation of habitat on land, while the NMFS oversees its protection in marine waters. Most sea turtles nest on beaches in northwest Florida from mid-May through the end of August.

Aerial surveys of Atlantic loggerhead turtles have indicated that they are most common in waters less than 50 meters deep. Aerial surveys indicate that there are fewer numbers of turtles visible in shallow waters during the winter months than in the summer months. During the warmer months, the turtles spend more time at the water surface. During 1987, a survey of the maximum densities of sea turtles east of the Mississippi River to Perdido Bay, Alabama, resulted in an estimate of 0.3 sea turtles per 100 square kilometers (km^2). Estimates of sea turtle densities east of the Mississippi River from June 1988 to June 1990 ranged from 0.92 (winter) to 4.83 (spring) turtles per 100 km^2 (U.S. Air Force, 1999). Additional information on in-water sea turtle densities is available in Chapter 4.

<u>Beach Densities</u>

Eglin conducts monitoring surveys seven days a week from 15 May to 31 October. Turtle crawls are identified as either a true nesting crawl or false crawl (no nesting activity associated with the crawl). The sea turtle nests are marked with stakes and surrounded with surveyor flagging tape. Nests are then monitored throughout the entire incubation period for potential storm damage, hatching activity, and predation. Nests are only relocated if threatened by erosion, inundation, or predation.

For mapping purposes, beachfront at SRI was divided into 0.5-mile survey zones, and nesting data were recorded according to the zone in which they occur. Figure 3-3 shows these zones, and also provides a color-coded indication of nesting intensity for each zone by species. The pink color below each nesting zone indicates the average number of loggerhead nests and the yellow or green color indicates the average number of green turtle nests. This color-coded map feature was created to provide an overall picture of relative nesting intensity across the Island. These averages were calculated over 14 years for the Atlantic loggerhead and over seven years for Atlantic green turtles due to the fact that between 1989 and 2002 green turtles were known to nest only every other year on SRI. However during the 2003 nesting season, four green sea turtle nests were documented for the first time on SRI during what was expected to be a loggerhead-only nesting year. Two of these nests occurred in zone 8 and the other two in zone 6. Because this is the first time this has occurred, the probability of a green nest occurring during a loggerhead-only year is very low. However, if this trend continues, it will be necessary to take this into account for future SRI operations.

Due to the seasonality of sea turtle nesting and hatching behavior, the effects of each proposed activity must be analyzed according to the time period during which training takes place. To simplify the analysis of impact to Eglin's nesting population, the sea turtle reproduction cycle can be divided into four time periods. During the first time period, only nesting occurs within the exercise area. 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 in the exercise area. Because nesting and hatching activity usually occurs under the cover of darkness, nighttime operations are more likely to impact reproduction.

An analysis of emergence data for SRI revealed that out of 186 loggerhead nests with known incubation lengths, 151 (or 81 percent) hatched after 60 to 80 days of incubation. The shortest recorded incubation length for a loggerhead nest is 53 days and the longest is 88 days. Out of 57 green turtle nests, 43 (or 75 percent) hatched after 60 to 80 days of incubation. The shortest recorded incubation length for a green turtle nest is 51 days and the longest is 82 days. The two recorded incubation lengths for leatherback nests were 85 and 94 days (U.S. Air Force, 2003d). Overall, the earliest recorded sea turtle nest at Eglin SRI was recorded on 12 May and the latest nest was recorded on 22 August. The overall average incubation length for all species was 67 days. Based on this information, four time periods were calculated for each species. The earliest and latest possible dates for all species were selected to produce the combined species time periods (Table C-1).

Table C-1. Sea Turtle Nesting and Hatching Periods by Species

Species	Nesting Only	Nesting and Hatching	Hatching Only	Off-Season
Caretta caretta	5/23 – 7/14	7/15 – 8/22	8/23 – 11/19	11/20 – 5/22
Chelonia mydas	5/20 – 7/9	7/10 – 8/22	8/23 – 11/12	11/13 – 5/19
Dermochelys coriacea	5/12 – 6/19	N/A	8/5 – 9/21	9/22 – 5/11
Combined Species	**5/12 – 7/9**	**7/10 – 8/22**	**8/23 – 11/19**	**11/20 – 5/11**

Based on the data presented in Table C-1, operations taking place on SRI between 20 November and 11 May effectively have a 0 percent probability of impacting sea turtle nesting and hatching activities. However, the USFWS and Eglin have agreed to use 1 May through 31 October as Eglin's official sea turtle season because very few hatching events actually occur in November. All references in this document to sea turtle season refer to this period (1 May through 31 October). In certain cases, it will be more appropriate to divide the sea turtle season into separate periods, one for nesting and one for hatching. Sea turtle nesting season for Eglin will be considered 1 May through 31 August and sea turtle hatching season will be 1 July through 31 October. The combined sea turtle nesting and hatching seasons, or sea turtle season, will run from 1 May through 31 October.

If the Proposed Action occurs within the sea turtle nesting and/or hatching time periods, in order to better quantify possible impacts, it is necessary to determine how nesting and hatching activity is distributed throughout these time periods. Figure C-1 shows the average number of nests that have occurred on Eglin SRI by month. Again, the total number of green turtle nests was averaged over seven years, while that for loggerheads and leatherbacks was averaged over

14 years. This information indicates that the peak nesting period for loggerhead sea turtles occurs in June, earlier than the peak green turtle nesting period, which occurs in July.

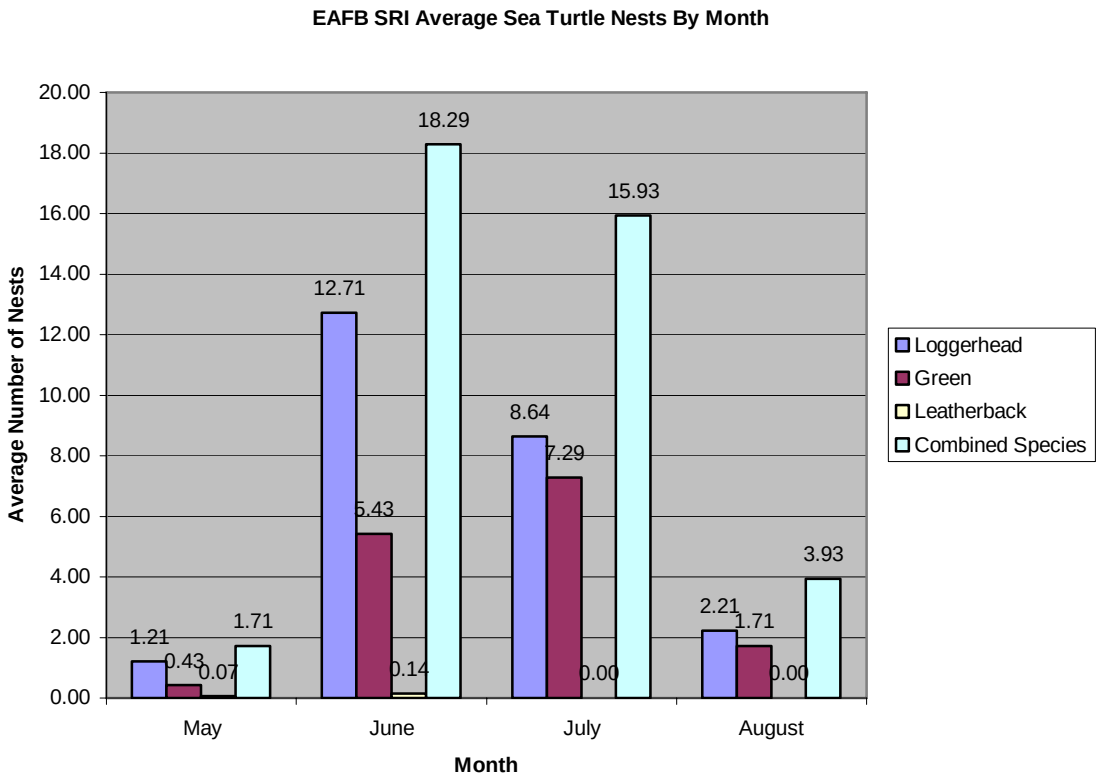

Figure C-1. Eglin AFB SRI Average Sea Turtle Nest Occurrences by Month (1989-2003)

The peak nesting season can be estimated using the information in Figure C-1. The information displayed in the figure indicates that loggerhead nesting peaks in June. Dividing the average number of nests occurring in June by 30 days yields a peak nesting emergence rate of 0.424 nests per night. By the same method, during a green turtle nesting year, the peak nesting rate is calculated to be 0.235 nests per night (number of green turtle nests in July, divided by 31 days). 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., 35). Therefore, the peak rate of loggerhead turtle nesting emergences is 0.012 nests per night per 0.5 mile, and the peak rate of green turtle nesting emergences is 0.007 nests per night per 0.5 mile. Because only three leatherback nests have been documented on Eglin AFB, SRI, over a 14-year period, the leatherback nesting emergence rate is effectively nil.

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 186 of 347 total loggerhead nests. Of the 186 recorded hatching dates, only four (2.15 percent) occurred in July. If this percentage is applied to the total number of loggerhead nests recorded, 7.46 loggerhead nests would be expected to have hatched in July over the 14-year data collection period, yielding an average of 0.53 loggerhead hatchings annually during the month of July. Once again, the

total for green sea turtles was averaged over seven years. The combined average is over 14 years. This information is summarized in Table C-2. This table 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 245 out of the 454 total nests (54 percent), the calculated averages for the number of nests hatching per month should suffice for purposes of this analysis (Table C-2).

Table C-2. Eglin AFB SRI Calculated Average Sea Turtle Hatching Occurrences by Month

		Loggerhead	Green	Leatherback	Combined
	Total Nests	347	104	3	454
	No. Nests with recorded hatching dates	186	57	2	245
July	Calculated Average	0.53	0.52	0.00	0.79
August	Calculated Average	12.53	4.43	0.00	14.69
September	Calculated Average	9.06	7.30	0.21	12.97
October	Calculated Average	2.40	2.61	0.00	3.71
November	Calculated Average	0.27	0.00	0.00	0.26

Atlantic Loggerhead Sea Turtle (Caretta caretta)

The loggerhead turtle (*Caretta caretta*), federally and state listed as threatened, gained its status on 28 July 1978. Loggerhead nests in Florida account for 90 percent of all loggerhead nests in the United States. From March through June, adult loggerheads congregate in the nearshore and offshore waters of the Gulf of Mexico to mate. Their nesting sites are on the numerous barrier islands and beaches between the Florida Keys and the northern Gulf of Mexico. Nesting females approach Santa Rosa Island in the spring and summer to dig their nests between the high tide mark and the dune line and sometimes between dunes. These turtles are the most commonly seen sea turtles in the southeastern United States and may be found near underwater structures and reefs (USFWS, 1996). It was concluded (NMFS and USFWS, 1991) that the loggerhead turtle population is continuing to decline in the southeastern United States, and shrimping is thought to have played a significant role in this decline (USFWS, 1996). The diet of loggerheads consists of gastropods, mollusks, coelenterates, and cephalopods (NMFS and USFWS, 1991).

Genetic research has identified four loggerhead nesting subpopulations in the western North Atlantic: 1) the Northern Subpopulation, occurring from North Carolina to around Cape Canaveral, Florida; 2) South Florida Subpopulation, occurring from Cape Canaveral on Florida's east coast to Sarasota on Florida's west coast; 3) Northwest Florida Subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City; and 4) Yucatán Subpopulation, occurring on the eastern Yucatán Peninsula, Mexico (Bowen, 1995; Bowen et al., 1993; Encalada et al., 1998). 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 will not be sufficient to replenish the depleted nesting subpopulation.

Atlantic Green Sea Turtle (Chelonia mydas)

The green sea turtle (*Chelonia mydas*) 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 listed as endangered by the State. In the United States, it nests on southern Florida beaches with a few exceptions in the northern Gulf of Mexico and North Carolina (USFWS, 1996). The officially recognized nesting and hatching season for the green sea turtle extends from 1 May

through 31 October in Florida's panhandle. Nesting in the panhandle, however, has been consistently documented as an every other year event since 1990, with incubation periods ranging from 60 to 90 days. Eglin AFB Santa Rosa Island property supports the highest number of green sea turtle nests in northwest Florida. Primarily a tropical herbivore, the juveniles are frequently found in the Gulf of Mexico in areas where there is an abundance of seagrass (USFWS, 1996).

Leatherback Sea Turtle (Dermochelys coriacea)

The leatherback sea turtle (*Dermochelys coriacea*) was originally listed as federally endangered on 2 June 1970, and is considered a State endangered species also. 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 (LeBuff, 1976; FWC FMRI, unpublished data; Longieliere et al., 1997). The officially recognized nesting and hatching season for the leatherback extends from 1 March through 30 September, with nest incubation ranging from 60 to 75 days (FWC FMRI unpublished data; Longieliere et al., 1997; FWC FMRI, 1998). 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 Santa Rosa Island (Miller, personal communication, 2000). The leatherback feeds primarily on jellyfish, but occasionally will eat sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed (USFWS, 1996).

Kemp's Ridley Sea Turtle (Lepidochelys kempii)

The Kemp's ridley (*Lepidochelys kempii*) turtle received the status of federally endangered, under the Endangered Species Act (ESA), throughout its range on 2 December 1970. Adults have the most restricted distribution of any sea turtle and are usually confined to the Gulf of Mexico, while postpelagic turtles may be found over crab-rich sandy or muddy bottoms. As hatchlings, the species presumably eat *Sargassum* (a floating seaweed) and small organisms associated with the floating *Sargassum*. Adults feed mainly on crabs (USFWS and NMFS, 1992).

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

The USFWS and NMFS designated the Gulf sturgeon (*Acipenser oxyrinchus desotoi)* as federally threatened under the Endangered Species Act (ESA) in 1991. The sturgeon is also considered a state listed species of special concern. 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 (USFWS and GSMFC, 1995). Migration into fresh water generally occurs from March to May, while migration into salt water occurs from October through November. Within the region of influence, sturgeon occur in the Yellow River in the spring and summer and in Choctawhatchee Bay, Santa Rosa Sound, and the Gulf of Mexico in the winter. Little is known about the offshore distance the Gulf sturgeon travels, but analyses of stomach contents suggest that feeding occurs as far as 20 miles offshore (Page and Burr, 1991; U.S. Coast Guard, 1996). Gulf sturgeon feed on insects, crustaceans, mollusks, worms, and small fish (U.S. Coast Guard, 1996; Page and Burr, 1991). Ghost shrimp are thought to be an important prey item for adult sturgeon. Bottom disturbing activities could significantly impact the Gulf sturgeon (USFWS, 2001).

The final rule for Gulf sturgeon critical habitat was published in the Federal Register on 19 March 2003. Critical habitat is defined by the ESA as specific areas within or outside the geographical area occupied by the species that contain physical or biological features essential to the species' conservation, and that may require special management considerations or protection. As pertains to this study area, the nearshore waters (up to 1 nm) along the Gulf of Mexico between Pensacola and Apalachicola Bays, FL have been designated as critical habitat. This area contains winter feeding and migration habitat for Gulf sturgeon.

Florida Perforate Reindeer Lichen (*Cladonia perforata*)

The Florida perforate reindeer lichen is state and federally listed as endangered. Extensive searches have shown this species to be extremely rare (only 12 documented sites). Many of these sites are threatened by habitat destruction due to development, agricultural operations, and recreational activities. Three of the known populations occur on Eglin AFB Santa Rosa Island (SRI) property (Figure 3-3, in Chapter 3). In 1995, Hurricane Opal destroyed two of these populations and reduced the remaining by more than 70 percent (Yahr, 2001). This reduced population persists just east of the Destin pass. Eglin AFB Natural Resources Section has installed fencing around the perimeter of suitable habitat. In June 2000, two reintroduction populations were established in the area of the lost populations, near test site A-10 on the north side of SRI. Recently collected monitoring data collected indicate that the populations are stable with minimal dispersal (Yahr, 2002).

Piping Plover (*Charadrius melodus*)

The piping plover is state and federally listed as endangered. Piping plovers are found in wintering habitats as early as mid-July and leave by early March (USFWS, 2001a). 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, 1996a). 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 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.

Wintering critical habitat for the piping plover was designated on 10 July 2001 (66 *Federal Register* 36038). *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. Although only a small section of SRI has been designated as critical habitat (Figure 3-2), piping plovers may be found any place 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 Santa Rosa Island (SRI). Although it is possible that piping plovers could use any one of these habitat types at any time during the wintering season, studies have shown that wintering plovers spend 76 percent of their time foraging for invertebrates found just below the surface of wet sand (Johnson and Baldassarre, 1988).

Eglin AFB Natural Resources Section and volunteer personnel have periodically conducted shorebird surveys on SRI during the wintering season. These surveys included participation in the International Piping Plover Census in January of 1991, 1996, and 2001. Piping plovers were not sighted on Eglin's property during any of these official surveys. During the 2001 survey, the closest sighting occurred at Navarre Beach State Park and Big Sabine Point (Ferland and Haig, 2001). Volunteers from the Choctawhatchee Audubon Society have conducted periodic shorebird surveys on SRI during which six piping plovers were documented foraging within the designated critical habitat. Two shorebird surveys were conducted on SRI during January and February of 2003, during which no piping plovers were sighted (Fenimore, 2003).

Least Tern (*Sterna antillarum*)

The least tern is the smallest of the North American tern species. It is currently state-listed as threatened, with only interior U.S. populations federally listed as endangered. On Eglin AFB, nesting colonies have been documented on open, flat areas on SRI and several gravel rooftops on Eglin Main. Successful nesting on SRI is rare, primarily due to heavy predation from feral cats. While most colonies have been documented on the easternmost portion of Eglin's SRI property, another colony was recently documented near test site A-17 (Miller, 2003).

Southeastern Snowy Plovers (*Charadrius alexandrinus*)

The southeastern snowy plover is state-listed as a threatened species and is one of several shorebird species found on Eglin barrier island property. During the breeding season, these birds may be found foraging anywhere along the SRI beachfront. Nests are typically laid in the wrack line near vegetated areas, and will be abandoned if disturbed. Vehicular and foot traffic, storms, and predation by feral cats are considered the primary causes of nest failure. Eglin beach property contains the highest densities of snowy plovers (37 percent of Florida's breeding pairs) and the most productive nesting areas in the state (U.S. Air Force, 2002).

Black Skimmer (*Rynchops niger*)

The black skimmer is one of several ground-nesting shorebirds known to nest on Santa Rosa Island and is listed by the state of Florida as a species of special concern. The greatest threats to this species are attributed to human disturbance and storm-related flooding of nest sites, as well as predation of eggs and hatchlings (FNAI, 2001). During the nesting season from mid-May through August, skimmers can be seen foraging for fish in nearshore waters of both the Gulf and Santa Rosa Sound. Historically, nesting colonies have been documented in open, flat areas on eastern portions of Eglin island property from test site A-4 to the Destin Pass. However, another colony was documented in June 2002 near test site A-17 (Miller, 2003).

Snowy Egret (*Egretta thula*)

The snowy egret is a small, white, yellow-toed wading bird designated as a species of special concern by the Florida Fish and Wildlife Conservation Commission (FWC, 2003). The breeding distribution of this species ranges from northern California east to South Dakota and south to Florida and parts of the Caribbean and South America. In Florida, breeding season lasts from January through August. Snowy egrets spend the winter months in the southernmost parts of their breeding range, the U.S. southeast, and in southern California. In the Florida panhandle, colonies of snowy egrets nest primarily in swamps or in emergent vegetation in conjunction with

other species of wading birds. This species forages in both freshwater and saltwater habitats for fish, shrimp, and small vertebrates (FWC, 2003).

Little Blue Heron (*Egretta caerulea)*

The little blue heron, closely related to the snowy egret, is listed as a species of special concern by the state of Florida because of its dependence on wetlands, which are diminishing (FWC, 2003). While it is not rare in coastal areas, it seems to prefer freshwater habitats. The little blue heron is a solitary feeder but a colonial nester that often occurs with other species of wading birds. Its diet consists of insects, shrimp, amphibians, and fish. In Florida, breeding occurs from April through September, and migrations may occur in the panhandle from February through March (FWC, 2003).

Tricolored Heron (*Egretta tricolor*)

The tricolored heron is a slim, medium-sized heron with a head and upper body dark slate blue in color with purple coloration on its chest. This species, formerly known as the Louisiana Heron, is designated a state species of special concern. Breeding occurs from February through August. This species nests in colonies, often with other heron and ibis species, from Massachusetts down to the Caribbean and northern Brazil. It is a solitary feeder, foraging in both fresh and saltwater habitats (FWC, 2003).

White Ibis (*Eudocimus albus*)

The white ibis has been designated a species of special concern by the Florida Fish and Wildlife Conservation Commission due to species declines (FWC, 2003). Coastal islands, freshwater marshes or ponds, and standing water provide breeding habitat for this species. This species usually nests from March to August but has been known to nest from February through October in the Florida panhandle. The white ibis migrates generally in February and in September-October. It is rare or absent from the panhandle during the winter months. Prey organisms include crayfish, crabs, insects, snakes, frogs, toads, and fish (FWC, 2003).

Marine Mammals

Two marine mammal species occur in the Gulf of Mexico in the area of SRI operations. The bottlenose dolphin (*Tursiops truncatus*) occurs year-round, and the endangered West Indian manatee (*Trichechus manatus*) is sighted on rare occasions. Bottlenose dolphins are thought to form discrete communities in Gulf of Mexico estuaries and are afforded protection under the Marine Mammal Protection Act (MMPA) (Warring et al., 1999). Bottlenose dolphin density estimates derived from aerial surveys during the GulfCet II surveys for the offshore area in the Gulf of Mexico are 0.31 animals per square mile (Davis et al., 2000). The diet of Atlantic bottlenose dolphins consists mainly of fish, crabs, squid, and shrimp (Caldwell and Caldwell, 1983). Bottlenose dolphins usually occur in groups of 5 to 10 individuals.

Manatees occur infrequently in the north Florida panhandle with occasional sightings documented in the news media. Winters in north Florida prevent the cold-sensitive manatees from occurring year-round. Their occasional presence is most probably a result of chance migration from warmer regions. Manatees are protected under the ESA as well as the MMPA.

Santa Rosa Beach Mouse (*Peromyscus polionotus leucocephalus*)

The Santa Rosa beach mouse is one of five beach mouse subspecies and is the only subspecies not currently listed by either the state or the federal government. However, it may be considered for federal listing in the near future. Santa Rosa beach mice are mostly nocturnal, and burrow nest 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 Santa Rosa Island, was decimated after storm surge from Hurricane Opal in 1995 destroyed dune habitat. Monthly track count surveys conducted by Eglin AFB Natural Resources Section personnel indicate a 40 percent increase in population from 1996 to 2001 (U.S. Air Force, 2002). Currently, quarterly surveys are used to monitor population status. Current threats to this population include predation by feral cats and loss of dune habitat from recreational foot traffic and storms.

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APPENDIX D

COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

D.1 INTRODUCTION

This document provides the State of Florida with Eglin Air Force Base'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.

Pursuant to Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, as amended, its implementing regulations at 15 C.F.R. Part 930, this is a Federal Consistency Determination for mission activities described within the Santa Rosa Island Programmatic Environmental Assessment (Chapter 2 of the EA).

Proposed Eglin Air Force Base Action

The proposed action and preferred alternative of the EA is Alternative 3, which entails the establishment of a dedicated mission utilization plan for Santa Rosa Island (SRI) based on historical and anticipated future usage and the establishment of Special Operations/LCAC Live Fire Training Areas and Surf Zone Test Areas. Current Island activities include air operations testing, electronic countermeasures testing, surface-to-air missile testing, OA-HITL testing, surf zone testing/training, LCAC training/weapons testing, ground testing, personnel/equipment drops and extractions, ground training, natural/cultural resources management, and public use. Additional potential future uses include expanded surf zone testing/training, small boat obscurant testing, expanded OA-HITL tower testing, live fire operations, expanded special operations training, amphibious assaults, expanded LCAC training/testing, and other testing/training. More detail on SRI missions is provided in Chapters 1 and 2 of the EA.

The U.S. Air Force, Air Armament Center has evaluated the missions described in the Santa Rosa Island Programmatic Environmental Assessment for potential effects to the land or water uses or natural resources of the State of Florida's coastal zone within the context of the statutes listed in the Florida Coastal Zone Management Plan (below).

D.2 FEDERAL CONSISTENCY REVIEW

Statutes addressed as part of the Florida Coastal Zone Management Program consistency review and considered in the analysis of the proposed action are discussed as follows:

D.2.1 Chapter 161 – Beach and Shore Management

The proposed project will not adversely affect beach and shore management, specifically as pertains to:

- ***The Coastal Construction Permit Program***. Construction would not occur seaward of the mean high water line.
- ***The Coastal Construction Control Line (CCCL) Permit Program***. Construction would not occur seaward of the CCCL, where wind and wave forces would potentially cause

significant fluctuations in the beach/dune system. Further, all land activities occur on federal property.

- ***The Coastal Zone Protection Program***. Buildings would not be constructed between the seasonal high-water line and 1,500 feet landward of the CCCL.

D.2.2 Chapter 163, Part II – County and Municipal Planning and Land Development Regulation

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.

D.2.3 Chapter 186 – State and Regional Planning

State and regional agencies were provided the opportunity to review the environmental assessment. The proposed action, which occurs primarily on federal property, conforms to the State Comprehensive Plan and associated translational plans, including the State Land Development Plan, the Florida Water Plan and the Florida Transportation Plan, and strategic regional policy plans.

D.2.4 Chapter 252, Emergency Management

The proposed action would not increase the state's vulnerability to natural disasters. Emergency response and evacuation procedures would not be impacted by the proposed action. Certain activities described in Chapter 4, Section 4.5 would require closure of Highway 98 on the eastern portion of Santa Rosa Island; thus, traffic delays would be expected. To ensure that impacts would be minimized, a number of actions would be taken, and are detailed in the *Traffic Impacts* sections in Chapter 4, Section 4.5.

D.2.5 Chapter 253 - State Lands

The proposed action would involve the use of state submerged lands. The proposed Surf Zone Test Areas and Special Operations/LCAC Live Fire Training Areas proposed for the western portion of the Island exist within Air Force controlled restricted, prohibited and warning areas. However, the Surf Zone Test Area and Special Operations/LCAC Live Fire Training Area proposed for the eastern portion of the Island would require the establishment of a new restricted area. Though the project would occur on state lands or state submerged lands, an Environmental Resource Permit (ERP) or Joint Coastal Permit (JCP) would be necessary given that the proposed action may result in impacts to submerged resources.

D.2.6 Chapters 253, 259, 260 and 375 – Land Acquisition

The proposed action would involve state water areas and state historical or archeological sites. A shipwreck is located east of A-15A, but would not be impacted by Eglin operations, as discussed in Chapter 4, Section 4.3. As detailed in Chapter 4, Section 4.4 of the EA, the impacts to habitats would not be significant and state lands would not be affected.

D.2.7 Chapter 258 – State Parks and Preserves

State parks, recreational areas and aquatic preserves would not be affected by the proposed action. Dredge and fill operations, or erection and repair of structures would not occur within any aquatic preserves. Mission activities under the proposed action would occur to the west of Henderson Beach State Park, but tourism and outdoor recreation there would not be significantly affected, as discussed in Chapter 4 Section 4.5. Opportunities for recreation on state lands would not be significantly decreased.

D.2.8 Chapter 267 – Archives, History and Records Management

Potential impacts to cultural resources are discussed in Chapter 4, Section 4.3 of the EA. Cultural resource sites eligible/potentially eligible for the National Register of Historic Places are listed in Chapter 3, Section 3.5. The sites are in various stages of investigation and/or data collection by the Eglin Cultural Resources Branch (96 CEG/CEVH), and the information gathered will be used to manage and minimize the impact of activities discussed in this EA. Due to the presence of other sites that have not been evaluated, coordination with 96 CEG/CEVH and consultation with the State Historic Preservation Office is required.

D.2.9 Chapter 288 – Commercial Development and Capital Improvements

The proposed action occurs primarily on federal property. The proposed action is not anticipated to have any effect on future business opportunities on state lands. Potential exists for impact to the promotion of tourism in the region if beach or road closures on the eastern portion of the Island became too frequent, but measures will be taken to minimize both the frequency and duration of closures, and closures would avoid the tourist season. Additional minimization actions are detailed in Chapter 4, Section 4.5.

D.2.10 Chapters 334 and 339 – Public Transportation Administration and Finance

Potential impacts to public transportation were evaluated in Chapter 4, Section 4.5 of the EA. Some potential for short-term closure of waterways and Highway 98 exist. Based on the analysis, the proposed action would have an effect on water and land transportation within the region of influence, with possible delays. Coordination (i.e., notification) with local government and the State Department of Transportation and/or U.S. Coast Guard is required. Management practices to minimize impacts would be implemented and are presented in Chapter 4, Section 4.5.

D.2.11 Chapter 370 – Saltwater Fisheries

Saltwater fisheries would not be significantly affected. Access to some water areas may be temporarily restricted. Guidelines for the frequency of closure of Gulf and Sound water areas are published in the U.S. Coast Pilot and would be followed. Potential impacts were evaluated in Chapter 4, Section 4.5.

D.2.12 Chapter 372 – Wildlife

Potential impacts to wildlife, including threatened and endangered species are evaluated in Chapter 4 Sections 4.3 and 4.4. Impacts to threatened and endangered species would be

minimized or prevented through the implementation of management practices detailed in Chapter 4, Sections 4.3 and 4.4, and coordination with Eglin Natural Resources Section, and state and federal protected resource management agencies. With given management practice in place, the proposed action would not significantly affect threatened and/or endangered species. A Biological Assessment would be prepared for potential impacts to federally listed species.

D.2.13 Chapter 373 – Water Resources

The proposed action would affect surface waters since many of the activities involve some aspect of water transportation or use. Erosion and impacts to water quality are discussed in Chapter 4 Section 4.4. Consumptive water use, though not discussed in the EA, will not interfere with any presently existing legal use of water, and use of water resources is consistent with the public interest. Best management practices would be implemented to minimize erosion and associated water quality impacts. As discussed in Chapter 4, Section 4.4, potential impacts to water resources would not be significant.

D.2.14 Chapter 376 – Pollutant Discharge Prevention and Removal

The discharge of solid materials, including casings, bullets, and debris may occur during training exercises. Incidental amounts of petroleum products may be released during boat operations. There would be no significant impacts to the environment from pollutant discharges.

D.2.15 Chapter 377 – Energy Resources

Energy resource production, including oil and gas, and the transportation of oil and gas, would not be affected by the proposed action.

D.2.16 Chapter 380 – Land and Water Management

The proposed action would primarily occur on federally owned lands. Under the proposed action, development of state lands with regional (i.e., more than one county) impacts would not occur. Areas of Critical State Concern or areas with approved state resource management plans such as the Northwest Florida Coast and the Escambia and Santa Rosa Counties coastal area would not be affected. Changes to coastal infrastructure such as bridge construction, capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would not occur.

D.2.17 Chapter 381.001, .0011, .0012, .006, .0061, .0065, .0066, .007 – Public Health

The proposed action does not involve the construction of an on-site sewage treatment and disposal system. Field wastes would be collected via portable latrines and disposed of at an offsite sewage treatment facility. A permit is not applicable for the proposed action.

D.2.18 Chapter 388 – Mosquito Control

The proposed action would not affect mosquito control.

D.2.19 Chapter 403 – Environmental Control (Sources of Water and Air)

Some aspects of the proposed action occur in state waters and would affect ecological systems and water quality of state waters to a small degree. Effects on water quality would not be significant and are discussed in Chapter 4, Section 4.4. No dredge and fill operations, discharges into groundwater or effects to public drinking water supplies would occur. Debris from gunnery, shrapnel, and flare chutes may be input into state waters but attempts would be made to minimize their expenditure into surface waters. The proposed action would involve air emissions from boats, helicopters, smoke grenades and small arms ammunition but this amount is comparatively small with respect to other air emission sources. Air quality impacts analyzed in Chapter 1, Section 1.4 would not be significant.

Note: *This statute applies to water related development and associated resource impacts (degradation of ecological systems and/or water quality), dredge, fill and construction activities in state waters, discharges into groundwater or surface waters of the state, electrical transmission line and corridor siting, generation and transportation of hazardous wastes, solid waste management, water well drilling and use, public drinking water supply, air pollution sources, open burning, and artificial reef construction.*

D.2.20 Chapter 582 – Soil and Water Conservation (Erosion Control and Prevention)

The proposed action would result in soil erosion and increases in turbidity from soil erosion. Best management practices for preventing and controlling erosion would be necessary and are described in Chapter 4, Section 4.4.

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 its response is not received by Eglin AFB on the 60th day from receipt of this determination.

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APPENDIX E

SANTA ROSA ISLAND OPERATIONS PROGRAMMATIC BIOLOGICAL ASSESSMENT MITIGATIONS

Table E-1. Mitigations from Santa Rosa Island Operations Biological Assessment

Species	Activity	Location	Time of Year	Mitigation
Sea Turtles	S/A Missile Testing	TA A-15	5/1 to 10/31	No nighttime test events will occur during sea turtle season.
				Active nests should be marked and any hatchlings disoriented by setup activities should be redirected.
				Missile launches requiring nighttime setup should avoid sea turtle season if possible.
				During sea turtle season, low-pressure sodium vapor lighting and light shields should be used, and all unnecessary non-mission or safety lights should be turned off.
	OA-HITL Tower Testing	TA A-13B	5/1 to 8/31	Reduce OA-HITL tower night operations during nesting season when possible, especially during the peak nesting season for each sea turtle species (June and July).
	Surf Zone Testing	TA A-15, TA A-10, ~TA A-2	5/1 to 10/31	When possible, surf zone testing should not be conducted during sea turtle season.
				Beach setup activities should be performed during daylight hours only during sea turtle season.
			7/1 to 10/31	No surf zone detonations should be conducted within 24 hours of any turtle nest hatching on Air Force property within 3 miles in either direction of the site of detonation.
				Remove all ruts deeper than 2 inches created by setup activities prior to sunset during sea turtle hatching season. All such ruts created during night operations will be removed immediately following the operation completion.
			Year-round	Pre- and post-detonation monitoring would be conducted using a vessel and/or aircraft to survey the impact area for protected species. If a protected species were sighted within the impact area, tests would be postponed until the animal is clear of potential Level B noise impacts.
				Nighttime surf zone testing will not be conducted.
	Personnel/ Equipment Drops and Extractions	Surf Zone, NYE and OPUS PZs	5/1 to 10/31	Minimize night personnel/equipment drops and extractions during sea turtle season when possible, especially during the peak nesting season for each sea turtle species (June and July)
				From 11 May to 31 October, if surveys indicate a sea turtle nest is within 200 feet of the PZ, another PZ will be used for that mission.
	Amphibious and Land-based Activities	Various Locations	5/1 to 10/31	Between 1 May and 31 October, when activities will be conducted on the beach during the night, one participant will be designated as an observer to be responsible for identifying signs of nesting or hatchling sea turtles. The observer will be responsible for assuring 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 will remain quiet, allowing the turtle to continue her activities. All effort will be made not to obscure the turtle crawl or the nest area.
				If hatchling turtles are observed on the beach, all activities will cease until the hatchlings reach their destination. All effort will be made not to obscure the turtle crawls or the nest from where they emerged. Following completion of the activity, Eglin Natural Resources Section will be contacted to verify the nest hatching.

Table E-1. Mitigations from Santa Rosa Island Operations Biological Assessment Cont'd

Species	Activity	Location	Time of Year	Mitigation
Sea Turtles (cont'd)	Amphibious and Land-based Activities (cont'd)	Various Locations (cont'd)	5/1 to 10/31 (cont'd)	Minimize nighttime amphibious and land-based activities on the beachfront when possible during sea turtle season.
				No daytime (sunrise to sunset) mission-related beachfront activities are to begin before completion of daily sea turtle nest survey and protection measures (nest marking or relocation) from 1 May to 31 October unless approved through a Section 7 consultation.
				Mark and protect all known sea turtle nests in accordance with established Eglin Natural Resources Section and state protocol so they can be easily identified by vehicle operators and troops. An additional 10-foot boundary will 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 must be stationed at each nest that is at or past incubation day 60. In the event that the nest hatches, the observer will be required to coordinate with the training/testing participants to assure that the hatchling have unimpeded access to the water.
				For nighttime activities that are conducted on the beach between 1 May and 1 September, a one-time survey is conducted two hours prior to the start of the activity on the portion of the beach where the activity will occur. All nests located during surveys at night are marked and protected (or relocated where approved) before the nighttime activity begins.
				Vehicle operators should remain alert at all times to the potential presence of sea turtles on the beach.
				Vehicle operators and troops will avoid marked sea turtle nests by at least 50 feet.
				Vehicles should traverse the beachfront as close to the waterline as possible and below the waterline when possible.
				Vehicular movement should remain at least 50 feet below the primary dune line.
				Fighting holes, trench systems, vehicle or equipment traps, artillery bunkers, etc. must be refilled and leveled after the activity is finished
				To the extent practicable, stage vehicles and watercraft at water's edge. Whenever it is necessary to stage vehicles, watercraft, or set up equipment on the beachfront, install silt screens around the base of the vehicles/craft/equipment and remove immediately following the operation. If a vehicle will be left on the beach for more than one night, then a surveyor must be present to ensure that no turtles become entrapped.
				Eglin military and civilian personnel must 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.
				Continue to conduct daily morning sea turtle nest surveys between 15 May and 1 September in accordance with established Eglin Natural Resources Section and state protocol. Frequency of hatching and emerging success monitoring after 1 September must involve checking nests daily until the last nest has either hatched or reached 80 days incubation at which time the nest will be evaluated per state protocol.

Table E-1. Mitigations from Santa Rosa Island Operations Biological Assessment Cont'd

Species	Activity	Location	Time of Year	Mitigation
Sea Turtles (cont'd)	Amphibious and Land-based Activities (cont'd)	Various Locations (cont'd)	5/1 to 10/31 (cont'd)	Remove all ruts deeper than 2 inches prior to sunset during sea turtle hatching season. All such ruts created during night operations will be removed immediately following the operation completion.
				All holes or disturbed areas 2 feet or larger in diameter created as a result of vehicle or watercraft movement must be refilled immediately after the exercise is over
				Personnel conducting work, including driving and/or operating equipment on or adjacent to the beach, must use vehicle headlights at night only when the vehicle is moving and use sea turtle compatible hand-held lights and lighting on equipment at night.
				To the extent practicable, minimize lighting associated with mission activities 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.
			Year-round	Limit the size of vehicular movement corridors to the minimum necessary for the mission.
				Mark landing and movement corridors so as to be easily distinguished by the operators of amphibious landing vehicles/craft and other vehicles.
				Vehicles will remain on existing roads whenever possible.
				Sand dunes greater than 5 feet in height and large sea oat clumps will be avoided by troop and vehicular traffic.
				Avoid *Sargassum* mats in the water.
		~TA A-17A, TA A-15A, TA A-13B, TA A-6, ~TA A-3		LCACs will avoid vegetated areas to the greatest extent practical and will vary their paths within the designated crossover corridors.
		TA A-18, ~TA A-15, ~TA A-15A, TA A-13A, TA A-13, TA A-11, ~TA A-7, ~TA A-3, ~TA A-2	5/1 to 10/31	AAV and LCAC use within maneuver areas will be restricted to daylight hours during sea turtle season. Coordination with Natural Resources will be necessary to ensure that no nests are located within the maneuver area prior to AAV/LCAC use.
		7-mile ARG/MEU training area around TA A-13B		A sea turtle nest relocation program will be implemented in areas where amphibious landings will be conducted between 1 May and 31 October. EMSN must be notified at least 80 days prior to the action. Specific requirements for when and how nests will be relocated can be found in the *U.S. Fish and Wildlife Service Biological Opinion for U.S. Marine Corps Expeditionary Unit Training at Eglin AFB* (U.S. Air Force, 2003h).

Table E-1. Mitigations from Santa Rosa Island Operations Biological Assessment Cont'd

Species	Activity	Location	Time of Year	Mitigation
Sea Turtles (cont'd)	Small Boat Obscurant Testing	TA A-15, TA A-10, ~TA A-2	5/1 to 10/31	Use of small boats at night will be minimized when possible during sea turtle season, especially during the peak nesting season for each sea turtle species (June and July).
			Year-round	Avoid *Sargassum* mats.
	Live Fire	TA A-18, ~TA A-15, ~TA A-15A, TA A-13A, TA A-13, TA A-11, ~TA A-7, ~TA A-3, ~TA A-2	5/1 to 10/31	Minimize nighttime live fire missions whenever possible.
				An observer must be present to identify signs of sea turtle activity.
				If a sea turtle or hatchling is observed on the beach during live fire activities, all firing will cease and troops will remain quiet, allowing the turtle to continue activities.
				For live fire over water, conduct pre-mission surveys of the Gulf target and adjacent areas. If protected marine species are observed within the target or closely adjacent areas, testing will be delayed until the area is certified clear.
				Conduct post-mission surveys to search for any protected marine species potentially injured or killed.
				Conduct live fire testing only under conditions of suitable visibility and sea state.
	Live Fire	TA A-18, ~TA A-15, ~TA A-15A, TA A-13A, TA A-13, TA A-11, ~TA A-7, ~TA A-3, ~TA A-2	Year-round	Use frangible or non-lead munitions when possible.
Manatees	Surf Zone Testing	TA A-15, TA A-10, ~TA A-2		When possible, conduct surf zone tests during the winter to avoid manatees
				Pre- and post-detonation monitoring would be conducted using a vessel and/or aircraft to survey the impact area for protected species. If a protected species were sighted within the impact area, tests would be postponed until the animal is clear of potential Level B noise impacts.
				Whenever possible, monitoring for radio-tagged Gulf sturgeon would be conducted in the area prior to the surf zone detonation to locate individuals within a 0.5-mile radius of the detonation.
				Nighttime surf zone testing will not be conducted.

Table E-1. Mitigations from Santa Rosa Island Operations Biological Assessment Cont'd

Species	Activity	Location	Time of Year	Mitigation
Piping Plover	Personnel/ Equipment Drops & Extractions	~TA A-18	Mid-July to mid-May	Personnel/equipment drops and extractions should avoid known piping plover feeding areas
	Amphibious and Land-based Activities			Minimize amphibious and land-based activities during the winter foraging period near piping plover critical habitat
			Year-round	Restrict amphibious and land-based activities in piping plover critical habitat
	Live Fire	~TA A-18	Mid-July to mid-May	Minimize live fire during the winter foraging period near piping plover critical habitat
				Establish live fire buffer zones around known piping plover critical habitat during the winter foraging period (e.g., 150 meters for frangible munitions, 2000 meters for standard munitions)
				Direct live fire towards the Gulf
Perforate Lichen	Amphibious and Land-based Activities	~TA A-2, ~ TA A-7, ~TA A-10	Year-round	Avoid troop and vehicle movements through locations of the perforate lichen
				Restrict ground testing near lichen populations
		Entire Island		Restrict vehicle/equipment access in untreated areas with known invasive plant problems
				When possible, wash vehicles/equipment before transport onto the Island
				Keep vehicles on established roads when possible to avoid spread of invasive plants
				Designate access corridors from roads to beach and periodically monitor these corridors for invasive species
				Coordinate with Natural Resources Section to select native species for any new plantings on the Island
				Screen sources of construction material and fill dirt to ensure that no invasive plants are present
				Use only certified weed-free vegetative material (e.g., hay bales, pine straw) if brought in from off the Island
Essential Fish Habitat	Watercraft Traffic, Surf Zone Testing	Surf Zone	Year-round	Avoid *Sargassum* mats
	Watercraft Traffic	Surf zone east of TA A-15A		Avoid shipwreck east of A-15A

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APPENDIX F

STATE COORDINATION FOR SANTA ROSA ISLAND MISSION UTILIZATION PLAN DOPAA

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

January 17, 2003

Ms. Marisol Reina
AAC/EMSP
501 DeLeon Street, Suite 101
Eglin Air Force Base, Florida 32542-5133

RE: U.S. Department of Defense - Eglin Military Complex/Air Armament Center
Santa Rosa Island Mission Utilization Plan - Description of Proposed Action and Alternatives – Eglin Air Force Base, Okaloosa County, Florida

SAI: FL200211253106C

Dear Ms. Reina:

The Florida State Clearinghouse has coordinated the review of the above-referenced Santa Rosa Island Mission Utilization Plan document. Comments provided by our reviewing agencies are summarized below and enclosed for your consideration in preparing the referenced Environmental Assessment (EA).

The Florida Fish and Wildlife Conservation Commission (FWC) indicates that Santa Rosa Island and its nearshore waters support diverse fish and wildlife communities, including several listed species. Listed shore birds and sea turtles are most likely to be impacted by the proposed activities, especially during spring and summer nesting seasons. Construction, lighting and wires associated with large towers may adversely impact migratory birds. The FWC recommends scheduling operations during non-nesting seasons. If that is not possible, consultation with the FWC regarding listed species will be required. Compliance with the U.S. Fish and Wildlife Service guidelines for sea turtles and tower facilities would minimize potential adverse impacts. Please refer to the enclosed FWC comments for details and requirements.

The Northwest Florida Water Management District (NWFWMD) indicates that Santa Rosa Island supports diverse terrestrial and aquatic habitats and other environmental resources. Therefore, NWFWMD recommends that state and federal agencies work together to identify specific habitats and resources on Santa Rosa Island for which protection is essential while also facilitating the military mission. Please refer to the enclosed NWFWMD comments for additional information.

The Department of Environmental Protection (Department) notes that the types of exercises proposed are likely to result significant impacts along specific landing sites, with minor impacts throughout the training area. The proposed types of activities may require post-exercise assessment and repair or mitigation. Repair of impacts to dunes will help stabilize the dunes and avoid a complete loss of dune function and dune blowouts. If possible, paths through the dunes that could minimize impacts should be considered for the proposed operations. It may also be appropriate to limit access to certain areas that are slow to recover.

Beach landings fronting the Gulf of Mexico that will occur on Eglin property will not require a coastal construction permit. The construction of targets or access facilities in nearshore waters, Santa Rosa Sound and/or wetland areas, however, may require permits from the Department's

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Ms. Marisol Reina
January 17, 2003
Page Two (2)

Bureau of Beaches and Wetland Systems or the Northwest District Office in Pensacola. Please refer to the Department's enclosed Memorandum dated January 6, 2003, for further details.

The scheduling of exercises during marine turtle nesting, which generally runs from May through October, may impact nesting activities. In addition, some operations may interfere with beach mice and shorebird nesting, resting, and foraging. Therefore, close coordination with both the U.S. Fish and Wildlife Service and the FWC's Bureau of Protected Species Management is advised to identify measures for protecting sea turtles, beach mice and shorebirds. To address any marine turtle protection requirements, the Endangered Species Act consultation should be initiated early in the planning process.

The Florida Highway Patrol (FHP) requests that it be notified in advance of commencement of each training exercise. The contact for the area is Major Randall M. Brown, Troop Commander, (850) 872-4150, extension 238. Please refer to the enclosed FHP comments for additional details.

The military is also advised to coordinate road closures with the Florida Department of Transportation (DOT). Please contact Mr. Tommie Speights at tommie.speights@dot.state.fl.us or by telephone early in the day at toll free 1-888-638-0250 or (850) 638-0250, extension 208. Mr. Speights can thereafter be reached on his cell phone at (850) 638-6430. DOT's normal business hours are 7:00 AM to 4:00 PM CST, Monday through Friday. Since it is anticipated that training will also occur outside normal office hours, DOT must have advance notification to assure appropriate personnel are on hand.

The environmental assessment of the alternative actions should include identification of the potential impacts to coastal, saltmarsh and freshwater habitats, dune vegetation, listed species, and water quality; measures for storing, handling and retrieving hazardous materials; and plans for avoiding and mitigating impacts.

The draft EA and all subsequent environmental documents prepared for the Santa Rosa Island Mission Utilization Plan must be submitted to the State Clearinghouse for review to determine the mission activities' consistency with the Florida Coastal Management Program (FCMP). The state's consistency concurrence with the plan will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews.

Thank you for the opportunity to review the proposed project. If you have any questions regarding this letter, please contact Ms. Rosalyn Kilcollins at (850) 245-2161.

Sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/rk

Enclosures

cc: Duncan Cairns, NWFWMD
Brian Barnett, FWC
Dick Fancher, DEP, Northwest District

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FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

QUINTON L. HEDGEPETH, DDS
Miami

EDWIN P. ROBERTS, DC
Pensacola

ROLNEY BARRETO
Miami

SANI RA T. KAUPE
l lm Beach

H.A. "HERKY" HUFFMAN
Enterprise

DAVID K. MEEHAN
St. Petersburg

JOHN D. :OOD
Jackso rille

NNETH D. HADDAD, Execut ve Director
TOR J. HELLER, Assistant E:ecutive Director

BRIAN S. BARNE: ', INTERIM DIRECTO:
OFFICE OF ENVI ONMENTAL SERVICE
(850)488-68 TDD (850)488-954
FAX (850)922-567

December 30, 2002

Ms. Cindy Cranick
Florida Coastal Management Program
Department of Environmental Protection
3900 Commonwealth Boulevard, Douglas Bldg.
Tallahassee, FL 32399-3000

RE: SAI FL200211253106C, U.S. A r Force – Scoping Notice – Santa Rosa Island Mission Utilization Plan, Eglin Air Force Base, Okaloosa County

Dear Ms. Cranick:

The Office of Environmental Services of the Florida Fish and Wildlife Conservation Commission has reviewed the referenced notice, and offers the following comments.

The notice discussed the various actions and alternatives associated with the propose mission uti ization plan. The plan seeks to achieve the intended future site usage with minin al adverse environmental impacts.

Santa Rosa Island and its associated nearshore waters support diverse fish and wildli communities, including a number of state and federal listed species. Listed species that coul be particularly impacted by military activities are sea turtles and shore birds, including the least tern, snowy plover, and black skimmer. Impacts to these species would be most likely durin their spring and summer nesting seasons. Scheduling operations to non-nesting seasons, and complying with U.S. Fish and Wildlife Service guidelines for sea turtles would minimize adv rse impacts to these species. However, if proposed military activities are expected to impact list d species under our jurisdiction, consultation should be initiated with our agency to address an resolve listed species concerns.

The construction of large towers to implement the proposed military operations may a so result in substantial adverse impacts to migratory birds, due to their lighting and associated w re bracing. U.S. Fish and Wildlife Service guidelines for tower facilities should be utilized to reduce the potential deleterious impacts to migratory avifauna that have been attributed to the e structures.

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JAN 0 2 200

620 South Meridian Street • Tallahassee • FL • 32399-1600

Ms. Cindy Cranick
December 30, 2002
Page 2

We appreciate the opportunity to comment on the submitted plan. Please contact me if you have any questions regarding this correspondence.

Sincerely,

Brian S. Barnett, Interim Director
Office of Environmental Services

BSB/RDM
ENV 1-3-2
eglinsri up
cc: Ms. Karen Lamonte, FWC, Panama City
Ms. Lorna Patrick, USFWS, Panama City
Ms. Robbin Trindell, OES-BPS

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
Project Review Form

TO: **State Clearinghouse**
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 47
Tallahassee, FL 32399-3000

DATE: **December 10, 2002**

SUBJECT: Project Review: **Intergovernmental Coordination**
Title: **U.S. Air Force-Scoping Notice-Santa Rosa Island Mission Utilizaior Plan-Description of Proposed Action and Alternatives-Eglin Ai Force Base, Okaloosa County, FL**
SAI #: **FL200211253106C**

The District has reviewed the subject application and attachments in accordance with its responsibilities and authority under the provisions of Chapter 373, Florida Statutes. As a resul review, the District has the following responses:

ACTION

____ No Comment.

____ Supports the project.

____ Objects to the project; explanation attached.

____ Has no objection to the project; explanation optional.

____ Cannot evaluate the project; explanation attached.

____ Project requires a permit from the District under____.

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DEGREE OF REVIEW

__x__ Documentation was reviewed.

____ Field investigation was performed.

____ Discussed and/or contacted appropriate office about project.

____ Additional documentation/research is required.

__x__ Comments attached.

SIGNED Duncan Jay Cairns
Chief, Bur. Env. & Res. Plng.

COUNTY: OKALOOSA

DATE: 11/4/02
COMMENTS DUE DATE: 11/25/02
CLEARANCE DUE DATE: 1/3/03

Message:

SAI#: FL200211253106C

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
COMMUNITY AFFAIRS FISH and WILDLIFE COMMISSION STATE TRANSPORTATION ENVIRONMENTAL PROTECTION	X NORTHWEST FLORIDA WMD	ENVIRONMENTAL POLICY UNIT

ttached document requires a Coastal Zone Management Act/Florida tal Management Program consistency evalutation and is categorized e 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.

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:

U.S. Air Force - Scoping Notice - Santa Rosa Island Mission Utilization Plan - Description of proposed Action and Alterntives - Eglin Air Force Base - Okaloosa County, Florida.

: Florida State Clearinghouse
AGENCY CONTACT AND COORDINATOR (SCH)
2555 SHUMARD OAK BLVD
TALLAHASSEE, FLORIDA 32399-2100
(850) 414-6580 (SC 994-6580)
(850) 414-0479

EO. 12372/NEPA

- ☐ No Comment
- ☑ Comment Attached
- ☐ Not Applicable

Federal Consistency

- ☐ No Comment/Consistent
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

COMMENTS ATTACHED

m:

Division/Bureau: NWFWMD Resource Management Div.

Reviewer: Duncan J. Cairns

Date: Date 10 DEC 02

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

MEMORANDUM

TO: Duncan Cairns, Chief, Bureau of Environmental Management and Planning

FROM: Paul Thorpe, Associate Water Resource Planner

DATE: December 10, 2002

SUBJECT: Scoping Notice – Santa Rosa Island Mission Utilization Plan; SAI# FL200211253106C

Eglin Air Force Base (AFB) has provided a Description of Proposed Action and Alternatives (DOPAA) for a Santa Rosa Island Mission Utilization Plan. The plan would provide for additional military uses on the Santa Rosa Island portion of Eglin AFB. The DOPAA indicates that additional environmental evaluation pursuant to the National Environmental Policy Act (NEPA) would be conducted to help minimize impacts to natural and cultural resources.

Santa Rosa Island is noteworthy in that it supports diverse terrestrial and aquatic habitats and other important environmental resources while providing the geographic characteristics that make it a valuable military training and testing resource. Based on review of the DOPAA, it appears that increased intensity of use of the island for a wide range of military activities is anticipated.

It is therefore recommended that the Air Force work with federal and state environmental agencies to identify specific habitats on the island that are distinct, valuable, and scarce, or otherwise under notable threat of loss outside of the Eglin AFB military reservation. Examples include Gulf coastal scrub and dune habitats, undeveloped estuarine embayments, seagrass communities, and intact estuarine riparian habitats. Outside of Eglin AFB, such habitat types are being eliminated, fragmented, or diminished in quality, both from direct development and from secondary effects of nearby development. Protection of such habitats on Santa Rosa Island will help to ensure the long-term survival of a diverse array of coastal habitats that are important for the Florida Panhandle environment.

It appears that additional environmental assessment pursuant to NEPA in support of the Mission Utilization Plan would offer an excellent opportunity to identify and protect valuable and increasingly scarce habitats and resources while facilitating accomplishment of the military mission.

District staff appreciate the opportunity to review the DOPAA. If amplification of the above recommendations or other information would be desired, please contact Paul Thorpe at (850) 539-5999 or Paul.Thorpe@nwfwmd.state.fl.us.

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APPENDIX G

STATE CLEARINGHOUSE COMMENTS AND CZMA CONCURRENCE

RECEIVED 26 May 04 FDA,

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Colleen M. Castille
Secretary

May 26, 2004

Ms. Elizabeth B. Vanta
Chief, Environmental Analysis Branch
501 De Leon Street, Suite 101
Eglin AFB, Florida 32542-5133

RE: Department of the Air Force – Draft Programmatic Environmental Assessment (PEA) for Santa Rosa Island Mission Utilization Plan, Eglin Air Force Base – Okaloosa and Santa Rosa Counties, Florida
SAI: FL200403265709C

Dear Ms. Vanta:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated the review of the above-referenced Draft Programmatic Environmental Assessment (PEA).

The United States Department of the Air Force proposes to establish a dedicated mission utilization plan for Santa Rosa Island (SRI) based on historical and anticipated future usage. The mission use plan accommodates coordinated land, air, and sea operations along the shoreline of SRI in Santa Rosa and Okaloosa County.

The Department of Environmental Protection (Department) indicates that the proposed activities will likely require permits from the Department's Northwest District for wetland impacts and stormwater management and may require authorization for the use of sovereignty submerged lands. The Air Force is advised to contact Josey Walker regarding wetland resource permits and sovereignty submerged lands authorizations and Cliff Street regarding stormwater permits. They can be reached at (850) 595-8300. The proposed beach landing areas fronting the Gulf of Mexico are specifically exempt from permitting pursuant to Chapter 161, Florida Statutes. Impacts from amphibious landings, movement of wheeled or tracked vehicles and troop maneuvers may, however, persist long enough to affect the behavior of native plants and animals and reduce the storm protection capacity of the system. Therefore, improved management practices that will prevent, reduce and mitigate for such impacts are recommended.

The Florida Department of Transportation (FDOT) supports the Santa Rosa Island Mission Utilization Plan. FDOT appreciates the Air Force's efforts to avoid and limit any traffic disruptions on

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Florida State Clearinghouse

Ms. Elizabeth B. Vanta
May 25, 2004
Page 2

US Highway 98 and wishes to assist the Air Force by helping to publicize any planned road closings. The Air Force is advised to contact Mr. Tommie Speights, FDOT Public Information Officer at (850) 638-0250, Ext. 208 with information regarding any planned closings of US Highway 98.

Based on the information contained in the above-referenced draft PEA and the comments provided by our reviewing agencies, as summarized above and enclosed, the state has determined that, at this stage, the proposed project is consistent with the Florida Coastal Management Program (FCMP). All subsequent environmental documents prepared for the project must be reviewed to determine the project's continued consistency with the FCMP. The state's consistency concurrence with the project will be based, in part, on 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 stage.

Thank you for the opportunity to review the project. Should you have any questions regarding this letter, please contact Mr. Daniel Lawson at (850) 245-2174.

Sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/dtl

Enclosures

cc: Mollie Palmer, DEP
Dick Fancher, DEP
Sandra Whitmire, DOT

Florida State Clearinghouse

Florida Clearinghouse

Florida
Department of Environmental Protection
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Project Information	
Project:	FL200403265709C
Comments Due:	April 25, 2004
Letter Due:	May 25, 2004
Description:	DEPARTMENT OF THE AIR FORCE - DRAFT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR SANTA ROSA ISLAND MISSION UTILIZATION PLAN, EGLIN AIR FORCE BASE - OKALOOSA AND SANTA ROSA COUNTIES, FLORIDA.
Keywords:	USAF - SANTA ROSA ISLAND MISSION PLAN - EGLIN AFB - OKALOOSA/SANTA ROSA CO.
CFDA #:	12.200

Agency Comments:
COMMUNITY AFFAIRS - FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS
Released Without Comment
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
NO COMMENT BY RICK MCCANN ON 5/25/04.
STATE - FLORIDA DEPARTMENT OF STATE
No Comment
NORTHWEST FLORIDA WMD - NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
NO COMMENT
ENVIRONMENTAL POLICY UNIT - OFFICE OF POLICY AND BUDGET, ENVIRONMENTAL POLICY UNIT
No Comment
WEST FLORIDA RPC - WEST FLORIDA REGIONAL PLANNING COUNCIL
No Comments - generally consistent with the West Florida Strategic Regional Policy Plan.
OKALOOSA - OKALOOSA COUNTY
SANTA ROSA - SANTA ROSA COUNTY
TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION
The Florida Department of Transportation supports the Santa Rosa Island Mission Utilization Plan. FDOT appriciates the Fir Force's efforts to avoid and limit any traffic disruptions on US Highway 98. FDOT wishes to assist the Air Force by helping to publicize any planned road closings. Please contact Mr. Tommie Speights, FDOT Public Information Officer, with information regarding any planned closings of US Highway 98.
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
The Department of Environmental Protection (Department) indicates that the proposed activities will likely require permits from the Department?s Northwest District for wetland impacts and stormwater management. The Air Force is advised to contact Josey Walker regarding wetland resource permits and Cliff Street regarding stormwater permits. They can be reached at (850) 595-8300. The proposed beach landing areas fronting the Gulf of Mexico are specifically exempt from permitting pursuant to Chapter 161, Florida Statutes (F.S.). Impacts from amphibious landings, movement of wheeled or tracked vehicles and troop maneuvers may, however, persist long enough to affect the behavior of native plants and animals and reduce the storm protection capacity of the system. Therefore, improved management practices that will prevent, reduce and mitigate for such impacts are recommended.

For more information please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

http://tlhora6.dep.state.fl.us/clearinghouse/applicant/project.asp?chips_project_id=25290 3/15/2005

COUNTY: OKALOOSA
SAI- USAF
2004-2816

DATE: 3/26/2004
COMMENTS DUE DATE: 4/25/2004
CLEARANCE DUE DATE: 5/25/2004
SAI#: FL200403265709C

MESSAGE:
REFERENCE SAI # FL200211253106C

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
COMMUNITY AFFAIRS	NORTHWEST FLORIDA WMD	ENVIRONMENTAL POLICY UNIT	
ENVIRONMENTAL PROTECTION			
FISH and WILDLIFE COMMISSION			
X STATE			
TRANSPORTATION			

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 - DRAFT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR SANTA ROSA ISLAND MISSION UTILIZATION PLAN, 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

- ☑ No Comment
- ☐ Comment Attached
- ☐ Not Applicable

Federal Consistency

- ☑ No Comment/Consistent
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

From:
Division/Bureau: Division of Historical Resources, Bureau of Historic Preservation
Reviewer: S. EDWARDS Laura A. Kammerer
Date: 4-13-04 4-15-2004
NHPA / 2002-11358

RECEIVED
APR 20 2004
OIP/OLGA

RECEIVED
04 MAR 31 PM 3:58

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
Project Review Form

RECEIVED
APR 30 2004
OIP/OLGA

TO: **State Clearinghouse**
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 47
Tallahassee, FL 32399-3000

DATE: **April 27, 2004**

SUBJECT: Project Review: **Intergovernmental Coordination**
Title: **Department of the Air Force-Draft Programmatic Environmental Assessment (PEA) for Santa Rosa Island Mission Utilization Plan, Eglin Air Force Base-Okaloosa and Santa Rosa Counties, FL**
SAI #: **FL200403265709C**

The District has reviewed the subject application and attachments in accordance with its responsibilities and authority under the provisions of Chapter 373, Florida Statutes. As a result review, the District has the following responses:

ACTION

_x___ No Comment.

____ Supports the project.

____ Objects to the project; explanation attached.

____ Has no objection to the project; explanation optional.

___ Cannot evaluate the project; explanation attached.

____ Project requires a permit from the District under____.

DEGREE OF REVIEW

__x__ Documentation was reviewed.

____ Field investigation was performed.

____ Discussed and/or contacted appropriate office about project.

____ Additional documentation/research is required.

____ Comments attached.

SIGNED Maria Gilbertson
Duncan Jay Cairns
Chief, Bur. Env. & Res. Plng.

COUNTY: OKALOOSA

DATE: 3/26/2004
COMMENTS DUE DATE: 4/25/2004
CLEARANCE DUE DATE: 5/25/2004
SAI#: FL200403265709C

MESSAGE:
REFERENCE SAI # FL200211253106C

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
COMMUNITY AFFAIRS	X NORTHWEST FLORIDA WMD	ENVIRONMENTAL POLICY UNIT	
ENVIRONMENTAL PROTECTION			
FISH and WILDLIFE COMMISSION			
STATE			
TRANSPORTATION			

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Project Description:

DEPARTMENT OF THE AIR FORCE - DRAFT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR SANTA ROSA ISLAND MISSION UTILIZATION PLAN, 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

- ☑ No Comment
- ☐ Comment Attached
- ☐ Not Applicable

Federal Consistency

- ☐ No Comment/Consistent
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

No comments

From:

Division/Bureau: NWFWMD
Reviewer: Resource Management Div. Duncan J. Cairns
Date: Date 26 APRIL 2004

FROM WFRPC (TUE)APR 13 2004 9:34/ST. 9:33/No.6806878384 P 1

WFRPC
WEST FLORIDA REGIONAL PLANNING COUNCIL

WEST FLORIDA REGIONAL PLANNING COUNCIL
Post Office Box 9759 • 3435 North 12th Avenue • Pensacola, Florida 32513-9759
Phone (850) 595-8910 • S/C 695-8910 • (800) 226-8914 • Fax (850) 595-8967

Lel Czeck
Executive Director

Cody Taylor
Chairman

Sydney Joel Pate
Vice-Chairman

FAX TRANSMITTAL (S) Total # of Pages (including cover) 1

TO: **STATE CLEARINGHOUSE ▪ FAX: (850) 245-2190/(850) 245-2189**
Phone: 850-245-2161

DATE: April 13, 2004

FROM: Terry Joseph, Intergovernmental Review Coordinator
Extension 206
josepht@wfrpc.dst.fl.us

SUBJECT: **State Clearinghouse Review(s) Fax Transmittals:**

SAI #	Project Description	RPC #
FL: 200403265709C	Dept. of the Air Force – Draft Programmatic Environmental Assessment (PEA) for Santa Rosa Island Mission Utilization Plan, Eglin Air Force Base- Okaloosa and Santa Rosa Counties	O637-4-01-2004
FL: 200403195638C	Department of the Air Force – Draft environmental assessment and FONSI for the Gulf Power Company Military Point transmission line project at Tyndall Air Force Base, Bay County, Florida	B541-03-25-2004

X	No Comments – Generally consistent with the WFSRPP
	Comments Attached

If you have any questions, please call.

"...Serving Escambia, Santa Rosa, Okaloosa, Walton, Bay, Holmes & Washington Counties and their municipalities..."

COUNTY: OKALOOSA

DATE: 3/26/2004
COMMENTS DUE DATE: 4/25/2004
CLEARANCE DUE DATE: 5/25/2004
SAI#: FL200403265709C

MESSAGE:
REFERENCE SAI # FL200211253106C

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
COMMUNITY AFFAIRS	NORTHWEST FLORIDA WMD	X ENVIRONMENTAL POLICY UNIT	
ENVIRONMENTAL PROTECTION			
FISH and WILDLIFE COMMISSION			
STATE			
TRANSPORTATION			

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Project Description:

DEPARTMENT OF THE AIR FORCE - DRAFT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR SANTA ROSA ISLAND MISSION UTILIZATION PLAN, EGLIN AIR FORCE BASE - OKALOOSA AND SANTA ROSA COUNTIES, FLORIDA.

To: Florida State Clearinghouse

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3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA

- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency

- [ ] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:

Division/Bureau: OEG OTTED
Reviewer: [illegible]
Date: 4/23/04

RECEIVED
MAR 30 2004
OFFICE OF POLICY AND BUDGET
ENVIRONMENTAL POLICY UNIT

APPENDIX H

PUBLIC REVIEW PROCESS

The following public notice appeared in the Fort Walton Beach Daily News on January 8, 2005. The public comment period extended from January 8 to January 25. There were no public comments.

PUBLIC NOTIFICATION

In compliance with the National Environmental Policy Act, Eglin Air Force Base announces the availability of draft Programmatic Environmental Assessment (PEA) and Finding of No Significant Impact (FONSI) for Santa Rosa Island Mission Utilization Plan at Eglin Air Force Base, Florida for public review and comment. The Proposed Action of the "Santa Rosa Island Mission Utilization Plan" is for the 46th Test Wing commander to establish a dedicated mission utilization plan for Santa Rosa Island based on historical and anticipated future use with minimal environmental impacts. For the purpose of this document, the portions of Santa Rosa Island addressed are the 4-mile strip eastward of Fort Walton Beach, the restricted access 13-mile section extending west to Navarre, and the 17 acre Test Area A-5 parcel. The Proposed Action seeks to preserve the integrity of the island as a dedicated DoD asset, support current mission activities, promote the efficient use of SRI in supporting military mission additions and surge and crisis needs in an environmentally responsible manner and identifying Best Management Practices for minimizing environmental impacts. Of the Alternatives considered, including the No Action Alternative, the Preferred Alternative has been identified as: Establishing a DoD Mission Use Plan based on past and current activities that have already been evaluated to include established restricted access measures and designated areas for current/historical mission activities, establishing Surf Zone Test/Training Areas and an established Special Operations/Landing Craft Air Cushion Live Firing Training Areas.

Your comments on this draft PEA are requested. Letters or other written or oral comments provided may be published in the Final document. As required by law, comments will be addressed in the Final document and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the final PEA or associated documents.

Private addresses will be compiled to develop a mailing list for those requesting copies of the final PEA. 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 PEA.

Copies of the draft Programmatic Environmental Assessment and Finding of No Significant Impact (FONSI) may be reviewed at the Fort Walton Beach Public Library, 105 SE Miracle Strip Parkway, Fort Walton Beach, Niceville Library, 206 Partin Dr., Niceville, Navarre Library, 8484 James M. Harvell Rd., Navarre, and the Destin Public Library 150 Sibert Avenue, Destin. Copies will be available for review from Jan. 8 through Jan. 22, 2005. Comments must be received by Jan. 25, 2005.

For more information or to comment on this proposed action, contact: Mr. Mike Spaits, 96th CEG/CEV, 501 De Leon St., Suite 101, Eglin AFB, Florida 32542-5133 or email: spaitsm@eglin.af.mil <mailto:spaitsm@eglin.af.mil> . Tel: (850) 882-2878. Fax: (850) 882-6284.

MEMO

11 March 2005

FROM: 96th CEG/CEV-PA

TO: CEVSP/46th TW/XPE

SUBJECT: **PUBLIC NOTICE "Santa Rosa Island Mission Utilization Plan," Eglin AFB, Florida**

A public notice was published in the *Northwest Florida Daily News* on Jan. 8th, 2005 to disclose completion of the Draft EA, selection of the preferred alternative, and request comments during the 15-day pre-decisional comment period.

The 15-day comment period ended on Jan. 22nd, with the comments required to this office not later than Jan. 25th, 2005.

No comments were received during this period.

//SIGNED//
Mike Spaits
Public Information Specialist