Programmatic Environmental Assessment
for the
Onslow Beach Master Plan
Marine Corps Base Camp Lejeune
Onslow County, North Carolina

with The Onslow Beach Master Plan

May 2006

Prepared for
Department of the Navy
US Marine Corps

in accordance with
Marine Corps Order P5090.2A

pursuant to
National Environmental
Policy Act Section 102(2)(C)

FINDING OF NO SIGNIFICANT IMPACT
AND
ENVIRONMENTAL ASSESSMENT
FOR
ONSLOW BEACH MASTER PLAN
MARINE CORPS BASE, CAMP LEJEUNE
ONSLOW COUNTY, NORTH CAROLINA

Responsible Officer:	Commanding Officer Marine Corps Base Camp Lejeune, North Carolina 28542-0004
Point of Contact:	Department of the Navy Naval Facilities Engineering Command, Atlantic Attn: Lisa Padgett, EV4 6506 Hampton Boulevard Norfolk, Virginia 23508-1278 Lisa.Padgett@navy.mil Phone (757) 322-4869

May 2006

Finding of No Significant Impact
Onslow Beach Master Plan
Marine Corps Base, Camp Lejeune, North Carolina

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA), Marine Corps Base, Camp Lejeune gives notice that an environmental assessment (EA) and a Finding of No Significant Impact (FONSI) have been prepared for implementation of the Onslow Beach Master Plan, Marine Corps Base, Camp Lejeune, North Carolina.

The Onslow Beach Master Plan was prepared to provide an integrated and comprehensive plan to enhance and manage the Onslow Beach ecosystem while continuing to support mission-related and recreational uses.

The no action alternative and the proposed action alternative were addressed in the EA. The no action alternative is to continue the relatively unorganized management of military training, recreational activities, and natural resource management activities on Onslow Beach. This would not result in additional environmental impacts; but, it would not provide for management strategies and facilities construction that would promote more efficient use of Onslow Beach like the proposed action would.

The proposed action is to implement the Onslow Beach Master Plan. The plan includes designating four land uses of Onslow Beach: live fire military training; military training; recreational beach; and special use/access. The proposed action is also the preferred alternative. New facilities have been proposed that when constructed will promote training in the designated training areas and recreation in the designated recreational areas. These include a gravel tactical vehicle trail, hardening two military amphibian vehicle splash points, installation of a fence and gate to separate the recreational and training areas, a new recreational fishing pier, administrative complex, restaurant, community center, lodging facilities, and parking areas. The proposed action also includes realignment of portions of Ocean Drive and conversion of Riseley Pier into a training observation deck or its completed demolition and construction of a training observation deck behind the dunes.

The EA demonstrates that the proposed action will have no significant adverse environmental impacts to the coastal zone, air quality, noise, soils, wildlife, vegetation, water quality, wetlands, threatened and endangered species, cultural resources, and floodplains. The proposed action will not affect minority or low income populations or children.

At such time that designs for construction projects begin, all applicable authorizations, certifications, and permits will be obtained as part of the design process. The conditions of these authorizations, certifications, and permits will be implemented during

construction of the projects. All work will be completed in accordance with the terms and conditions of applicable state and federal permits and approvals.

Based on information gathered during preparation of the EA, the United States Marine Corps finds that implementing the proposed action will not significantly impact the human environment. The EA addressing this action is on file and may be reviewed by interested parties at: Commanding Officer, Consolidated Public Affairs Office, Marine Corps Base, Camp Lejeune, North Carolina 28542-0004. Telephone number is (910) 451-7440.

27 July 06
Date

A. E. HODGES
Colonel, U. S. Marine Corps
Commanding Officer
Marine Corps Base, Camp Lejeune

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ENVIRONMENTAL ASSESSMENT
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Date

A. E. HODGES
Colonel, U. S. Marine Corps
Commanding Officer
Marine Corps Base, Camp Lejeune

Prepared for
Department of the Navy
U.S. Marine Corps

ER-00-045

In accordance with
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Programmatic Environmental Assessment

For
Onslow Beach Master Plan
Marine Corps Base Camp Lejeune, North Carolina

May 2006

Point of Contact:

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EXECUTIVE SUMMARY

The Marine Corps has prepared this programmatic environmental assessment (EA) pursuant to the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations in 40 CFR Parts 1500-1508, and Marine Corps Order P5090.2A.

S.1 Description of Proposed Action

The Marine Corps proposes to implement the Onslow Beach Master Plan OBMP provided as Appendix B of this EA. There is a need to segregate military training and public recreation on Onslow Beach to ensure training is optimized and recreational opportunities are conducted safely. The purpose of implementing the OBMP is to sustain, improve, and segregate military training, oceanfront recreation, and ecosystem conservation on Onslow Beach.

A number of individual projects are associated with the Proposed Action which is to implement the OBMP.

Land use designations would be defined. The four major designations are (1) Live Fire Training, (2) Recreational Beach, (3) Training, and (4) Special Use/Access. The Live Fire training portion of the beach stretches from Browns Island southeast to the Officer's Pavilion. The area from the SOTG compound, northeast to the Officer's Pavilion would be the designated Recreational Beach. Training portion of Onslow Beach would include the area between the Special Operations Training Group (SOTG) compound southwest to the splash point corridor leading to the Landing Zone Bluebird. The fourth land use type is for combined Special Use/Access. This designation applies to the area south of Onslow South Tower. This area will accommodate light training activities but the area will also be a focal point for natural resource management.

To delineate the southern training area from the recreation area, a fence would be built across the island where the paved road currently ends near the SOTG compound. A gate would limit access to the southern beach to military units and seasonally authorized recreational users.

A gravel tactical trail (tank trail) would be constructed along the northwest side of the island from the base of the Atlantic Intracoastal Waterway (AIWW) Bridge, behind the enlisted rental units, to the access gate described above. Pedestrian overpasses would be constructed to allow fisherman to access the AIWW when funding is available. The two amphibious splash points along the AIWW would be hardened to help control erosion at the bank.

The existing boat ramp, located north of the foot of the AIWW Bridge, would be enhanced. The new boat landing area would include a concrete ramp and short docks to aid in the launching and recovery of boats.

A new 900-ft pier would be constructed in the designated recreation area. The new pier would include the following amenities: a bait and tackle shop, bench seating, lighting, fish

cleaning tables with running water, and restrooms. There are two options being considered for the disposition of existing Riseley Pier depending on availability of funding. The first option would involve partial demolition of Riseley Pier and conversion into a training observation deck. The second option would involve a complete removal of Riseley Pier and the construction of a training observation deck immediately behind the dunes in the same area where Riseley Pier is currently located.

Certain recreational facilities would be demolished and/or removed and existing land would be used for the improved recreational facilities. Project components would include: (1) updating lodging units and adding up to 50 new units; (2) adding up to 22 new recreational vehicle sites; (3) constructing a community center, a beach complex (reservation center/administration building, laundry facility, and Location Exchange), a fishing center (rental facility, boardwalk, covered picnic pavilions, and boat trailer parking area), and an oceanfront restaurant; (4) enlarging and enhancing a centralized parking area; and (5) realigning the northern portion of Onslow Beach Road, near its intersection with Ocean Drive. The redevelopment would fulfill the recreational demand for improved facilities to serve base personnel and their families.

Outdoor recreation enhancements would include: (1) creating nature trails and observation platforms with interpretive signage; (2) constructing pedestrian and bike paths; and (3) building duck blinds on the current waterfowl impoundment. These enhancements are generally low impact.

Utilities and the wastewater treatment facilities are adequate to support the existing and proposed development at Onslow Beach. However, infrastructure would be maintained and upgraded as needed to keep up and meet any future requirements. Utility lines at Onslow Beach are currently overhead on utility poles. Under the OBMP, Camp Lejeune proposes to place the utility lines underground.

Overall, conservation practices outlined in the OBMP that would be implemented are: stabilize the dune/beach; remediate light-pollution; apply restrictions to off-road recreational vehicles (ORRVs); and restore native vegetation. Some of these conservation practices are restated or slight modifications to the practices outlined in the MCB Camp Lejeune Integrated Natural Resources Management Plan (INRMP) (2001). Other practices outlined in the plan are to minimize impacts associated with the proposed development of Onslow Beach.

S.2 Alternatives Considered

Two alternatives were fully evaluated in this Programmatic EA (PEA): implementing the OBMP and the No-Action Alternative. The Preferred Alternative would include implementing all of the project components discussed in this PEA. Additional alternatives to the Proposed Action could be implementing different combinations of the project components.

Under the No-Action Alternative, unsegregated military training and public recreational uses would continue on Onslow Beach. The No-Action Alternative does not meet the purpose for the Proposed Action. The land use conflicts would continue with significant strain on military training, public safety, and recreation.

Two other alternatives were considered but eliminated from further consideration in this document because they did not meet the intended purpose of the project: (1) designate and redevelop Onslow Beach into one military training area; or (2) designate and redevelop Onslow Beach into one recreational beach. These alternatives were eliminated from further consideration because the true benefit of Onslow Beach is that its unique natural features make it ideal for both military training and recreation, if these activities are appropriately separated.

Other alternatives briefly considered for individual project components included: (1) rehabilitating the current Riseley Pier; (2) building an additional bridge crossing the AIWW strictly for tactical vehicles, which would eliminate the need for all or most of the tactical trail; and (3) locating the lodging reservation office to the Mainside of the AIWW Bridge. These project component alternatives were not considered further because they also did not meet the purpose of the proposed action.

S.3 Environmental Impacts of Proposed Action

In summary, the implementation of the OBMP would not result in any significant adverse impacts to the environment. There would be no potential impacts to socioeconomics; community facilities and services; and hazardous materials and waste. Impacts to utilities; air quality; environmental justice; cultural resources; aesthetics and marine species would be negligible. Beneficial impacts to protection of children, safety, traffic and land use would result from the Proposed Action. The OBMP proposes a clearer designation of land use over what is currently in place, and this should have a positive effect on both the human and natural environment at Onslow Beach. Minor adverse impacts would occur from the Proposed Action include:

The proposed land use designation and the fence/gate complex would effectively remove several hundred yards of beach from recreational designation to training designation. This will have minor adverse impacts on recreation.

- During demolition and construction activities the Proposed Action would create additional noise at the localized sites and therefore would have short-term impacts.
- Impacts to geology topography and soils would occur from the construction of the proposed action. These impacts would be minor short-term impacts.
- Hardening the amphibious splash points and improving existing boat landing would have minor negative impacts on the existing Essential Fish Habitat in the AIWW.

S.4 Mitigation

The following measures would minimize the effects during the implementation of the OBMP:

- Native vegetation would be restored in training and recreational areas of the beach, where practical, to buffer stormwater runoff and create tracts of native vegetation.
- Dune stabilization measures would continue under the OBMP according to the *Biological Assessment and Opinion on the Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach* (2002). The use of sand fencing, planting native beach grasses, and placing Christmas trees in the dunes would help stabilize the dune system.
- State-approved erosion and sedimentation control plans would be implemented if they are necessary for any construction activities. The shoreline of the Atlantic Intracoastal Waterway would be stabilized with vegetation and riprap where necessary to reduce the erosion potential.
- If any artifacts or other cultural resources are encountered during construction, work would cease and the MCB Camp Lejeune Environmental Management Division would be contacted to investigate and identify additional archaeological survey requirements and mitigation measures that might be needed.
- All construction activities would be conducted in a manner that is consistent with the enforceable policies of the North Carolina Division of Coastal Management.
- Development of the proposed tactical trail would involve encroachment on the surrounding delineated wetlands. Mitigation of the potential loss of wetlands would include development of replacement wetlands or other mitigation measures permitted by the USACE. In addition to mitigation, a CWA Section 401 Water Quality Certification from the North Carolina Division of Water Quality would be required if there are impacts to water quality or wetlands.

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AAV	Amphibious Assault Vehicle
ac	Acre
ACOE	U.S. Army Corps of Engineers
AIWW	Atlantic Intracoastal Waterway
ALB	Amphibious Landing Beach
CAA	Clean Air Act
CAMA	Coastal Area Management Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
dB	Decibels
dBP	Peak decibels
DNL	Average Day-Night Noise Level
EA	Environmental Assessment
ECON	Environmental Conservation Branch
EFV	Expeditionary Fighting Vehicle
EIS	Environmental Impact Statement
EIWG	Environmental Impact Working Group
EO	Executive Order
FONSI	Finding of No Significant Impact
ft	Feet
GIS	Geographic Information System
ha	Hectare
HMMWV	High Mobility Multipurpose Wheeled Vehicle
IR	Installation Recovery
LANTDIV	Atlantic Division, Naval Facilities Engineering Command
LAV	Light Armored Vehicle
LCAC	Landing Craft Air Cushioned
LCU	Landing Craft Utility
LOB	Light Operation Beach
MCB	Marine Corps Base
MCCS	Marine Corps Community Services
MCO	Marine Corps Order
mi	Miles
mm	Millimeters
MMPA	Marine Mammal Protection Act
NAAQS	National Ambient Air Quality Standards

Acronym/Abbreviation	Definition
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Natural Resources
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NMFS	National Marine Fisheries Service
ORRV	Off-Road Recreational Vehicle
RCUZ	Range Compatible Use Zone
REIR	Request for Environmental Review
RHA	Rivers and Harbors Act
RV	Recreational Vehicle
SDZ	Surface Danger Zone
SOTG	Special Operations Training Group
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

1 PURPOSE AND NEED

The United States Marine Corps (USMC) proposes to implement the Onslow Beach Master Plan (OBMP) at Marine Corps Base (MCB) Camp Lejeune, North Carolina. Onslow Beach is the only beach on the East Coast of the United States where Marines and other U.S. military forces can practice amphibious expeditionary operations, making it critical to the readiness of U.S. military forces and the training environment at MCB Camp Lejeune. Onslow Beach also provides recreational areas for Marines, Navy, Coast Guard, retired military and their families and habitat areas for a number of threatened and endangered species.

The OBMP (April 2006) provides an integrated and comprehensive plan to manage the Onslow Beach ecosystem while continuing to support mission related and recreational uses from the present to the future. The OBMP outlines opportunities for integrating management and the use of Onslow Beach to ensure its sustainability for the future. Specifically, the OBMP proposes enhancement of Onslow Beach. Proposed projects would include enhancement of military training, public recreational uses, and natural resources management activities.

This Programmatic Environmental Assessment (PEA) of the OBMP implements the "tiering" process outlined in 40 CFR 1502.20, which encourages agencies to tier environmental documents, eliminating repetitive discussions of the same issue. By use of tiering from the OBMP and by referencing related environmental documents, this PEA concentrates on environmental effects and issues specific to the Proposed Action and alternatives at Onslow Beach.

The purpose of this PEA is to assess the direct, indirect, and cumulative impacts associated with implementing the OBMP and also provide information on the Onslow Beach environmental setting. If it is determined that a subsequent proposal will require preparation of a site-specific project supplemental EAs, the PEA provides information that can be referenced in those EAs. These project EAs would then focus on the key issues relevant to their individual proposed actions.

1.1 Background

Established in May 1941, MCB Camp Lejeune provides specialized training to prepare troops for expeditionary amphibious and land combat operations. One of the most critical components for that training is Onslow Beach. Onslow Beach was originally the home of a Reconnaissance Battalion housing motor pools, boats, and personnel. In the 1960's cottages began being built in order to provide recreation opportunities for Marines and their families.

1.1.1 Description of Onslow Beach

Onslow Beach and Brown's Island cover approximately 11 miles of beachfront with the associated primary and secondary dune systems grading to maritime scrub-shrub and tidal salt marsh along the Atlantic Intracoastal Waterway (AIWW). Onslow Beach is separated from Brown's Island by Browns Inlet to the northeast; and is separated from Ashe Island to the southwest by the New River Inlet. The AIWW separates Onslow Beach to the northwest from the Mainside of Camp Lejeune (mainland); and Onslow Bay (Atlantic Ocean) borders the beachfront to the southeast (see Figure 1-1 *Location of MCB Camp Lejeune*).

Onslow Beach contains two main roads. Onslow Beach Road crosses the AIWW bridge from the Mainside of MCB Camp Lejeune, and ends at a junction with Ocean Drive at the oceanfront. Ocean Drive traverses the island northeast to southwest from the Onslow North Tower to the New River Inlet. The paved Ocean Drive turns to gravel in the vicinity of the Special Operations Training Group (SOTG) compound, and continues to the southwest.

1.1.2 Current Uses of Onslow Beach

Activity levels on Onslow Beach vary in intensity and nature. Recreational uses, military training, and conservation activities overlap spatially and temporally. Competing uses sometimes create logistical, environmental, and safety issues. The beach provides habitat for several species protected under the Federal Endangered Species Act in addition to several species of concern identified by the state of North Carolina. Conservation measures are employed throughout Onslow Beach in order to protect the inhabitants and their habitats.

See the OBMP, Chapter 3 *Continuing Uses* for a detailed description of current training, recreational, and conservation activities at Onslow Beach in Appendix B.

Training

A substantial amount of training occurs on Onslow Beach. Training occurs primarily between Riseley Pier and the South Tower. Additionally, the area northeast of the North Tower is off limits to personnel because this is the N-1/BT-3 impact area. Figure 1-2 shows the locations of the Onslow Beach training areas.

Most typical training on Onslow Beach represents one component of a ship to shore movement of force. Depending upon the scale of the exercise, varying numbers of Amphibious Assault Vehicles (AAV), Landing Craft Air Cushioned (LCAC), Landing Craft Utility (LCU) boats, Expeditionary Fighting Vehicle (EFV), Zodiac's, RAC's, and the new Small Unit Riverine Craft (SURC) will transfer personnel and equipment from amphibious assault ships in Onslow Bay. Tactical vehicles including High Mobility Multipurpose Wheeled Vehicles (HMMWV), 7-ton trucks, Medium Tactical Vehicle Replacement (MTVR), Logistics Vehicle System (LVS), EVF, M-1 Abrams tanks, and Light Armored Vehicles (LAV), are offloaded from amphibious landing craft and move off the beach. The personnel and equipment move inland by way of paved road and bridge or by crossing the AIWW in AAVs via splash points. The reverse of this characterizes on-load operations with

Location of Marine Corps Base, Camp Lejeune

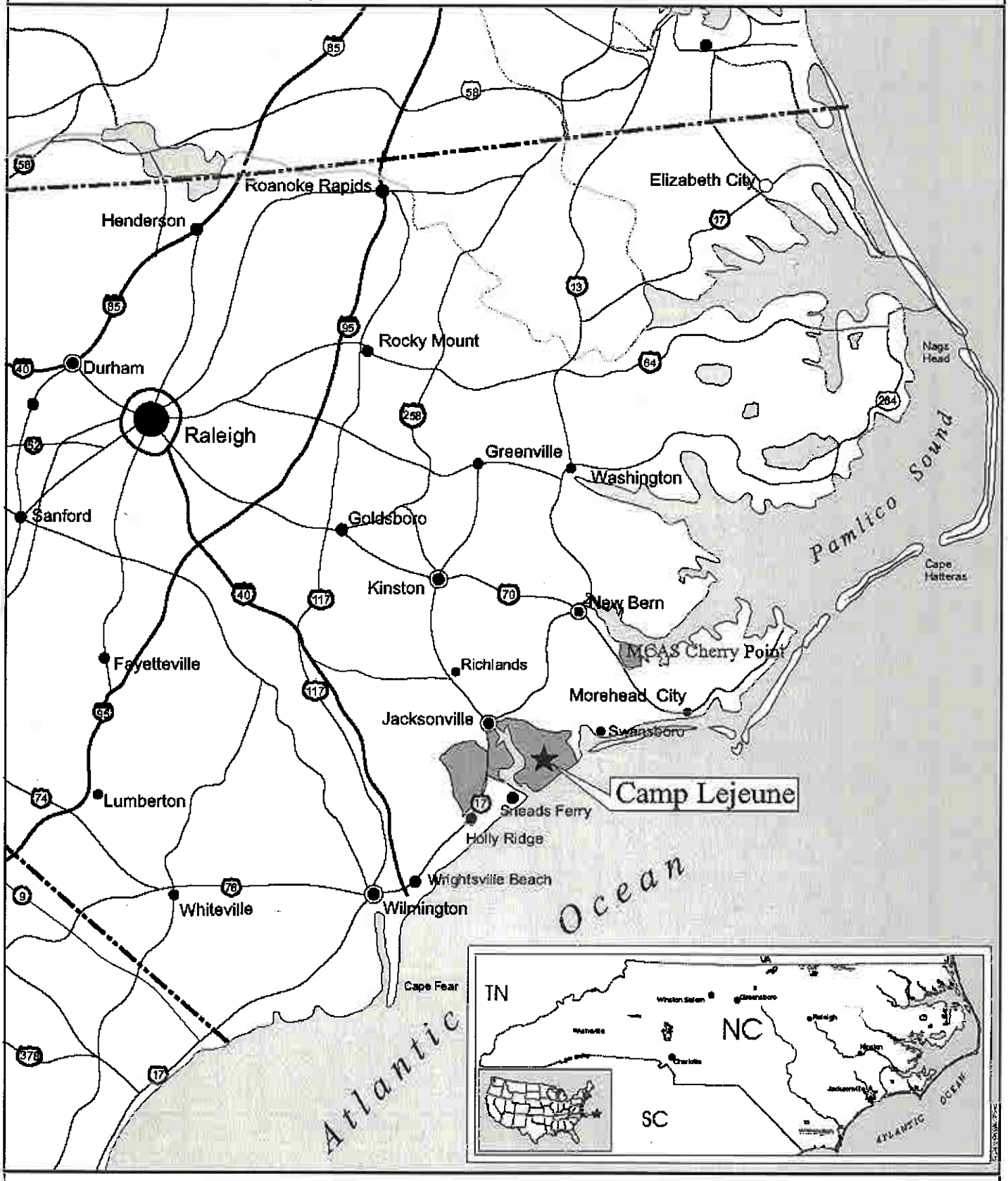

FIGURE 1-1
Onslow Beach EA

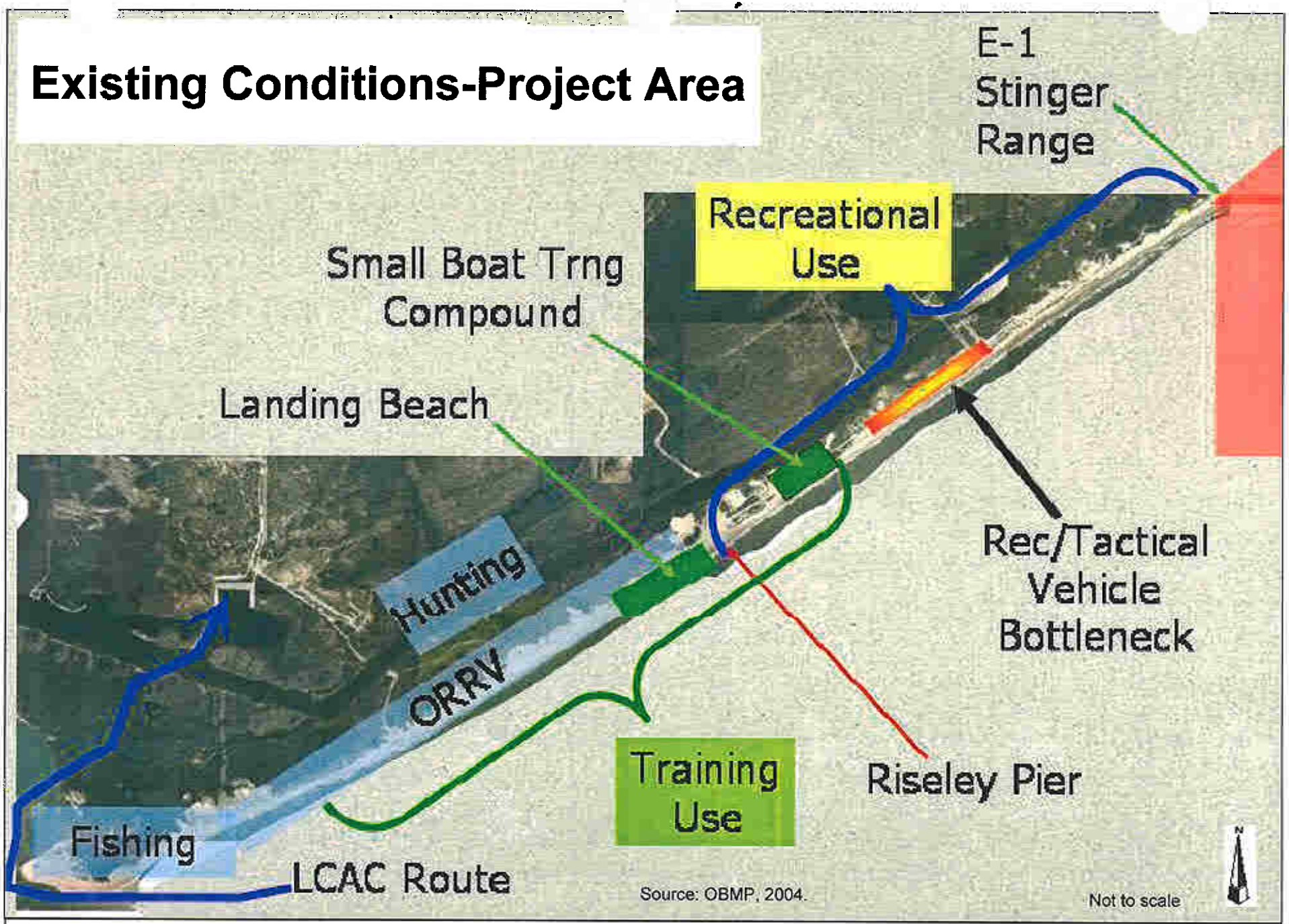

FIGURE 1-2
Onslow Beach EA

the addition of staging areas where equipment and personnel are consolidated prior to embarkation.

Small-scale training includes diving operations, small craft operations, driving school for large transport vehicles, communications exercises, and reverse osmosis water purification exercises. Table 1-1 summarizes the typical training events that occur on Onslow Beach.

Table 1-1Onslow Beach Typical Training Events

EXERCISE	FREQUENCY	DURATION	EQUIPMENT
CAPEX (*Capabilities Exercise)*	4/year	5 days	2 LCAC/ 10-12 AAVS
ESGMINT *(Expeditionary Strike Group/MEU Integration)*	3/year	8 days	200 vehicles/ 12 AAVs/ 3 LCACs/ 2 LCU
ESGEX *(Expeditionary Strike Group Exercise)*	3/year	9 days	Zodiac boats /200 vehicles/ 3 LCACs/ 2 LCUs
CERTEX *(Certification Exercise)*	3/year	7 days	Zodiac boats /200 vehicles/ 3 LCACs/ 2 LCUs
MEU on-load (Marine Expeditionary Unit)	3/year	2 days	100 vehicles/ 3 LCACs / 2 LCUs
MEU off-load	3/year	2 days	100 vehicles/ 3 LCACs / 2 LCUs
TCAT *(Type Commanders Amphibious Training)*	3/year	6 days	200 vehicles/ 3 LCACs/ 2 LCU
UNITAS preparation			Compilation of equipment/vehicles as described in MEUEX, SOCEX, on/off-loads
Amphibious Assault Vehicles Bn Training	90 days /year	daily use	10-12 AAVs
RECON BN/ SOTG/ Joint Armed Services training	300 days/year	daily use	Zodiac boats, personnel
JTFEX *(Joint Task Force Exercise)*	3-6/year	7-9 days	Compilation of equipment/vehicles as described in MEUEX, SOCEX, on/off-Loads
Live fire over AIWW onto Browns Island/ E-1 Stinger Fire Exercise	~ 10 / year	2-3 days (+2 days)	6 HMMWVS, target drones, 1-2 5-ton trucks.

To correct erosion and sediment control problems the Base hosts a dune restoration and stabilization program for the training areas to maintain the capacity to train. Program activities include installing sand fencing, planting beachgrass, and placing Christmas trees on the dunes to retain sand.

Recreation

Onslow Beach and its recreational activities are open to all active duty and retired military and their families, and authorized civilians. The current recreation area is between the Onslow North Tower and the Riseley Pier. Currently this area overlaps with the training area from the end of the paved road to the Riseley Pier. Fishing and Off-Road Recreational Vehicle (ORRV) driving are authorized by permit on Onslow Beach.

The Marine Corps Community Services (MCCS) manages commercial activities within Onslow Beach. MCCS has 74 beach rental units, 26 Recreational Vehicle (RV) campgrounds, 15 campsites, shower facilities, restrooms, picnic gazebos and pavilions, "Sand Trap" miniature golf course, and a bait and tackle shop on the Riseley Pier. Many of the lodging facilities operate near 100% capacity during the summer months.

The Environmental Conservation (ECON) branch manages outdoor recreational activities. Outdoor activities include restricted ORRV driving, hunting, and fishing. Beach patrons also enjoy shell collecting, sunbathing, swimming, and other activities associated with the beach. Additionally, ECON identifies areas where erosion and sediment control problems exist and directs dune restoration and stabilization activities. These activities include installing sand fencing, planting beachgrass, and placing Christmas trees on the dunes to retain sand.

Off-Road Recreational Vehicles affect habitat for threatened and endangered species, such as the sea turtles and seabeach amaranth, and habitat for shorebird communities. ORRV driving is currently restricted to only the area between the Riseley Pier and the New River Inlet (BO 11017.1F). Restrictions from the Riseley Pier to the South Tower include daytime ORRV use from April 1 to October 31 and day and nighttime use from November 1 to March 31 if no training is scheduled. In the area between the South Tower and the New River Inlet, ORRV use from April 1 to August 31 is prohibited. During September 1 to October 31 ORRV use is allowed during daylight hours and November 1 to March 31 ORRV use is allowed during day and night hours. The ORRV Base Order prohibits driving on vegetation, restricts access to the beach strand to designated ingress/egress points, and restricts vehicles on the beach strand to the area seaward of a set of markers placed between the high tide line and the first line of vegetation (MCB Camp Lejeune 2005).

Training

The area currently designated as the training portion of Onslow Beach, is located on the southwest end of the island. This area is also designated as a light training area (no tracked vehicles allowed). This area along with the rest of Onslow Beach is currently managed for sea turtle and shorebird nesting/habitat.

The ECON branch has monitored sea turtle nesting on Onslow Beach since 1979. Surveys for sea turtles are conducted regularly mid-May through August and turtle nests in the training areas are relocated to safer areas.

Since 2000 the ECON branch has been monitoring populations of colonial waterbirds and other shorebirds. Two species in particular are emphasized, the federally threatened piping

plover and the least tern, a species of state concern. Least tern nesting areas on the southern portion of the beach are marked to prevent vehicular or pedestrian disturbance. MCB Camp Lejeune studies the annual survival of eastern painted buntings, considered a federal species of concern in the southeastern United States. Painted buntings rely on maritime scrub-shrub and scrub live oak habitat for breeding. Maritime scrub-shrub is prevalent at Onslow Beach.

Six federally-protected marine mammal species inhabit Onslow Bay seasonally: the fin whale, humpback whale, north Atlantic right whale, sei whale, and the sperm whale. Camp Lejeune conducts aerial surveys of the N-1/BT-3 impact area before live-fire exercises, and postpones the exercise until marine mammals have cleared the area. Camp Lejeune is also active in the Marine Mammal Stranding Network, a volunteer service that reports and documents strandings in the coastal states.

1.1.3 Related Environmental Documents

In accordance with CEQ regulations for implementing NEPA (40 CFR 1502.21), material relevant to a Proposed Action may be incorporated by reference with the intent of reducing the size of the document. Accordingly, the below documents are referenced in this PEA because they are applicable to the Proposed Action.

Beach Erosion and Hurricane Protection Plan (1999)

This document provides information on geology, long-term erosion data and historic shoreline changes at Onslow Beach. This data is used in developing a long-term management plan to maintain the shoreline. This can be used as a planning tool for any activities occurring on Onslow Beach.

Integrated Natural Resources Management Plan 2002-2006 (November 2001)

In 2001, an Integrated Natural Resource Management Plan (INRMP) was prepared for MCB Camp Lejeune. Management plans outlined for Onslow Beach deal with sea turtle nesting, piping plover and other shorebirds, waterfowl, seabeach amaranth, and dune stabilization.

Biological Assessment and Opinion on the Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach (2002)

This document discusses training at Onslow Beach and its effects on seabeach amaranth, loggerhead and green sea turtles, and the Great Lakes, Atlantic Coast, and Northern Great Plains piping plover populations in accordance with Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. § 1531 et seq.). The United States Fish and Wildlife Service (USFWS) has concluded that these activities are "not likely to adversely affect" threatened and endangered species at Onslow Beach.

Marine Resources Assessment for the Cherry Point Operating Area (June 2002)

This Marine Resources Assessment (MRA) document provides the baseline for the physical and biological marine environment in the Cherry Point Operation Area. This area includes

the nearshore environment for Onslow Bay. Information from this MRA is used and/or referenced in the development of this PEA.

1.2 Need for the Proposed Action

MCB Camp Lejeune's need for this Proposed Action is derived directly from the Base's mission: to maintain combat-ready units for deployment. There is a need to segregate military training and public recreation at Onslow Beach to ensure training is optimized and recreational opportunities are conducted safely. In addition, a number of specific projects are needed to enhance military training, recreational opportunities, and natural resources management activities at Onslow Beach.

The major grievance of military trainers utilizing Onslow Beach surrounds the frequency of administrative pauses during a training exercise. Marine units accessing the primary training beach are forced to contend with recreational vehicular and pedestrian traffic; the AIWW Bridge, which opens every half-hour based on boat traffic; and conflicts with beachgoers in the training area. This serves to position tactical vehicles and recreational users in a potentially dangerous situation.

The existing recreational facilities at Onslow Beach do not fully meet the expectations of many of the MCCS customers. Components of recreation such as dining, retail conveniences, and entertainment are in demand. The demand for lodging often exceeds the supply in summer months. Furthermore, it is anticipated that the number of users of Onslow Beach will increase in the future as a result of: shift of military units under the Base Realignment and Closure process; increase retired military population in Eastern North Carolina; and the number and size of joint force exercises taking place at Camp Lejeune.

Impacts from recent storms in combination with inlet and AIWW dredging and modifications have resulted in dramatic changes in the beach and dune system at Onslow Beach. The erosion problem presented on Onslow Beach varies along the length of the beach, and is concentrated on the southern end. Erosion on the south end of the island appears to have been accelerated in the last 30-50 years as a result of inlet and intracoastal dredging and modification. This erosion problem is chronic and accelerating with time and threatens the future utilization of Onslow Beach as an amphibious training facility (MCB Camp Lejeune 2001).

The current use patterns on Onslow Beach allow for concurrent utilization by protected species and other native wildlife. The northeastern half of the island is preserved due to the N-1/BT-3 impact area. Beach activities and personnel are not allowed in this area for their own safety. The major concerns regarding wildlife-human interactions on the southwest end of the island are:

- Effects of artificial lighting on sea turtles;
- Lower sea turtle nesting along the recreational beach;

- Effects of ORRVs and human disturbance on nesting colonial waterbirds and shorebirds;
- Availability of suitable nesting habitat for waterbirds and shorebirds; and
- Conservation of protective qualities of the vegetated dune system.

1.3 Purpose of the Proposed Action

The purpose of implementing the OBMP is to sustain, improve, and segregate military training, oceanfront recreation, and ecosystem conservation on Onslow Beach. In order to accomplish this, land infrastructure and facilities improvements are necessary. Deficiencies in training realism and recreational opportunities must be remedied in a manner that minimizes conflict between the uses while preserving the balance with the dynamic ecosystem of a barrier island.

See OBMP; Sections 4.1.1, 4.1.2, and 4.1.3; subsections entitled *Supporting Goals and Objectives* for a detailed account of the purposes of the OBMP and this PEA.

1.4 The Environmental Review Process

1.4.1 The National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 requires the consideration of environmental issues in federal agency planning and decision-making. As the landholder, the USMC will be the decision makers with regard to the proposed implementation of the OBMP. Although other military services, such as the USN, will be users of Onslow Beach (to a much lesser extent than the USMC), the USN is not participating as a decision maker in the NEPA process.

Under NEPA, federal agencies must prepare an environmental assessment (EA) or environmental impact statement (EIS) for any federal action, except those actions that are determined to be "categorically excluded." An EIS is prepared for those federal actions that may significantly affect the quality of the human environment.

An EA is a concise public document that provides sufficient analysis for determining whether the potential environmental impacts of a Proposed Action are significant, resulting in the preparation of an EIS, or not significant, resulting in the preparation of a Finding of No Significant Impact (FONSI). Thus, if the USMC were to determine that the Proposed Action would have a significant impact on the quality of the human environment, an EIS would be prepared.

This PEA has been prepared pursuant to NEPA and the following NEPA implementation regulations and guidelines:

- The Council on Environmental Quality (CEQ) regulations as contained in 40 CFR 1500 to 1508, which directs federal agencies on how to implement the provisions of NEPA.

- MCO P5090.2A, which documents the USMC's internal operating instructions on how it implements the provisions of NEPA.

- Base Order 11000.1D, which outlines Camp Lejeune's environmental impact review procedures.

The intent of this PEA is to assess the potential environmental effects of the proposed implementation of the Camp Lejeune OBMP. Information and analyses documented in this PEA will be used to support the Commanding General of MCB Camp Lejeune in making one of three decisions available: approve the Proposed Action, approve the Proposed Action with modification(s), or disapprove the Proposed Action.

Additional NEPA analysis would be conducted if there is any substantial change in the future military training and public recreational uses of Onslow Beach that are not documented in this PEA, and if these changes are determined to have the potential to significantly impact the affected environment. The Environmental Impact Working Group (EIWG) at MCB Camp Lejeune reviews all proposals at the Base to determine the requirements for NEPA documentation, in accordance with Base Order 11000.1D (MCB Camp Lejeune, April 2000). In accordance with this Base Order the EIWG would review any requests for environmental impact review for proposals related to the OBMP to determine if they warrant further analysis under NEPA.

1.4.2 Scoping

MCB Camp Lejeune's Environmental Impact Working Group (EIWG) reviews proposed actions and environmental concerns on a Request for Environmental Review (REIR) worksheet filled out by the command heading the proposed project. The EIWG started receiving REIRs for projects at Onslow Beach in 1999. The group reviewed several projects involving the demolition/replacement of current facilities including the Officers and Staff Non-Commissioned Officers (SNCO) pavilions, enlisted pavilions, lodging facilities, and the Location Exchange (ER-00-016, ER-00-031, ER-00-045, and ER-02-101). Categorical exclusions were recommended for all of these projects except the Location Exchange (ER-02-101) for which an EA was recommended. In September 2002 the EIWG received a REIR for the construction of a bathroom/shower facility for Onslow Beach patrons (ER-02-155). At that point the EIWG recommended that an EA be prepared for the project. The Environmental Management Division announced plans to develop a beach management plan which culminated in the OBMP (April 2006). The purpose of this PEA, therefore, is to satisfy NEPA requirements for the implementation of the OBMP.

Scoping meetings are not required for an EA; hence, for this PEA, the USMC is not required to conduct scoping meetings. However, the USMC previously conducted a survey of beach users to obtain feedback about the proposed redevelopment of Onslow Beach to enhanced military and recreational uses of the beach. It was found that the users preferred keeping the

beaches in a natural state with scenic views and improvements in existing recreational facilities, nature trails, and recreational fishing. The users favored continued low-density development and maintaining the natural features of the beach over high-density development comparable to nearby resort beaches.

A kickoff meeting for this PEA was held 24 February 2004. The purpose of this meeting was to collect preliminary information and establish points of contact. Members from Camp Lejeune's EMD, MCCS, and Training & Operations Department were present. Important environmental considerations were identified and the scope of the EA was developed.

1.4.3 Resources Considered

Several resource areas deserve consideration prior to making a decision about the implementation of the OBMP. The environmental concerns specific to this PEA are:

- Land Use and Coastal Management
    - Land Use
    - Coastal Zone Management
    - Coastal Barrier Resources Act
- Recreation
- Environmental Justice and Protection of Children
- Infrastructure
    - Traffic On-Base
    - Utilities
    - Navigation
- Air Quality
- Noise
- Cultural Resources
- Natural Resources
    - Geology, Topography, and Soils
    - Terrestrial Wildlife and Vegetation
    - Marine Animals
    - Threatened and Endangered Species
    - Essential Fish Habitat
- Water Resources
    - Water Quality
    - Wetlands
    - Floodplains
- Safety
- Aesthetics
- Military Training Area

1.4.4 Resources with No Potential for Impacts

During the scoping for the Proposed Action, several issues were deemed to have no potential negative impacts to the human environment. The following issues were dismissed from further discussion within this PEA:

- **Socioeconomics** – At most only a few new permanent jobs would be created associated with the recreational activities at Onslow Beach. A few temporary construction jobs would be created spread over the period encompassed by the OBMP. No negative impacts would occur.

- **Community Facilities and Services** - The Proposed Action would not affect the number of Marines stationed and assigned to Camp Lejeune. Therefore, there would be no potential impacts to community services for fire, police, health care services or public schools.

- **Hazardous Materials and Waste** - Hazardous materials (e.g., oil, hydraulic fluid, ethylene glycol anti-freeze, and JP-8 fuel) would be managed under the existing Stormwater Pollution Prevention Plan. Compliance would follow requirements set forth in federal, state, and local statutes and regulations. Onslow Beach contains no Installation Restoration sites. Therefore no hazardous material and waste impacts would occur. Solid waste generated by demolition would be hauled to an approved landfill. Solid waste incurred from activities at the beach would be deposited in existing dumpsters that are serviced under contract.

1.5 Regulatory Compliance

Permits for the Proposed Action may include:

- North Carolina Water Quality (Section 401) permits.

- River and Harbors Act (Section 10) Permit.

- Federal Coastal Consistency Determination, concurrence by North Carolina Department of Environment and Natural Resources, Division of Coastal Management.

- Erosion and Sediment Control Plan, approval by North Carolina Department of Environment and Natural Resources, Division of Water Quality.

- Stormwater Management Permit, North Carolina Department of Environment and Natural Resources, Division of Water Quality.

- Coastal Barrier Resource System, documentation must be reviewed by the USACE to document compliance with the Coastal Barrier Resource Act (CBRA) and then reviewed by the Secretary of the Interior.

MCB Camp Lejeune environmental staff would conduct the necessary regulatory consultations and obtain the appropriate permits/approvals prior to proceeding with the Proposed Action.

2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The CEQ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* establish a number of policies for federal agencies, including "using the NEPA process to identify and assess the reasonable alternatives to the Proposed Action that would avoid or minimize adverse effects of these actions on the quality of the human environment (40 CFR 1500.2 (e))." This chapter describes the possible alternatives available to the decision-maker and summarizes the environmental impacts of those alternatives.

In addition to the Proposed Action the Marine Corps also considered other alternatives including the No-Action Alternative. The proposed action would include completing all of the project components discussed in this PEA. Alternatives to the proposed action would be combinations of some of the project components. Impacts for the "alternatives" therefore, could be analyzed as the sum of the individual impacts from the project components selected. The following section describes the proposed action, including a detailed discussion of each project component.

2.1 Details of the Proposed Action

The Proposed Action is to implement the Onslow Beach Master Plan (April 2006). The OBMP provides an integrated and comprehensive plan to enhance and manage the Onslow Beach ecosystem while continuing to support mission related and recreational uses. It is a strategic document, outlining opportunities for integrating uses of Onslow Beach to ensure its sustainability in the future.

The OBMP outlines land designation, infrastructure, and facility improvements at Onslow Beach to help implement the management strategies and improve current training, recreation, and conservation opportunities (see OBMP Section 4.1 *Future Uses, Development, and Conservation*). These infrastructure/facility improvements or management philosophies are grouped below as project components of the Proposed Action. The project components are organized in terms of their potential impacts for the ease of discussion within Chapter 4 of this PEA.

Each of the project components has different priorities outlined in Section 4.2.1 of the OBMP. Top priorities include relocation of the Riseley Pier northeast into the proposed recreation area; erecting a fence and security gate at the end of the paved road near the SOTG compound; and installing a gravel tactical trail from the gate near the SOTG compound to the foot of the AIWW Bridge. Recreational priorities include improving the "gateway" to Onslow Beach: realignment of the northeastern portion of Onslow Beach Road and the construction of an administrative complex, restaurant, community center, and

expanded parking area (Figure 2-1). The construction of new lodging facilities would follow this initial priority.

See OBMP for maps showing the locations of each specific project. The projects listed below are components of the Proposed Action that would be implemented.

2.1.1 Designate Land Use

In order to accomplish mission goals and objectives in the confines of the barrier island, land use designations would be defined. The designations would be intended to minimize conflicts between the different user groups and to provide a framework against which future projects would be measured for consistency. Although some level of shared use will occur within and between the delineated area, the intent is that the identified use takes priority in the decision making process. The four major designations are (1) Live Fire Training, (2) Recreational Beach, (3) Training, and (4) Special Use/Access (see Figure 2-2). The proposed conditions for the referenced land uses are mapped on Figure 2-3.

The Live Fire Training portion of the beach stretches from Brown's Island southeast to the Officer's Pavilion. It includes the impact areas of Brown's Island and northern Onslow Beach as well as the E-1 Range. It is separated from the remainder of Onslow Beach by fencing, a locked gate and warning signs.

The area from the SOTG compound, northeast to the Officer's Pavilion would be designated as the Recreational Beach area. Existing and future facilities along with the majority of recreational activities would be confined to this stretch of beach. Recreational uses and facilities would stretch from behind the primary dune to the shorelines of the AIWW in order to maximize recreational opportunities in this area.

The Training portion of Onslow Beach would include the area between the Special Operations Training Group (SOTG) compound southwest to the splash point corridor leading to the Landing Zone Bluebird. This portion of beach would be further delineated into the Amphibious Landing Beach (ALB) and the Light Operation Beach (LOB). The differentiation is due to the current protocol for the relocation of turtle nests where amphibious landings, which included tracked vehicle movement threaten nests left in place. The area from Riseley Pier to the Onslow South Tower would remain the amphibious landing beach, while lighter operations including wheeled tactical vehicles, small boats, or other similar training would take place from Riseley Pier north to the SOTG compound.

The fourth land use type is for combined Special Use/Access. This designation applies to the area south of Onslow South Tower. This area will accommodate light training activities but the area will also be a focal point for natural resource management. This area can accommodate light training activity if approved by the Base Range Control Office after coordination with the Environmental Conservation Branch. The area would primarily be used for natural resource management.

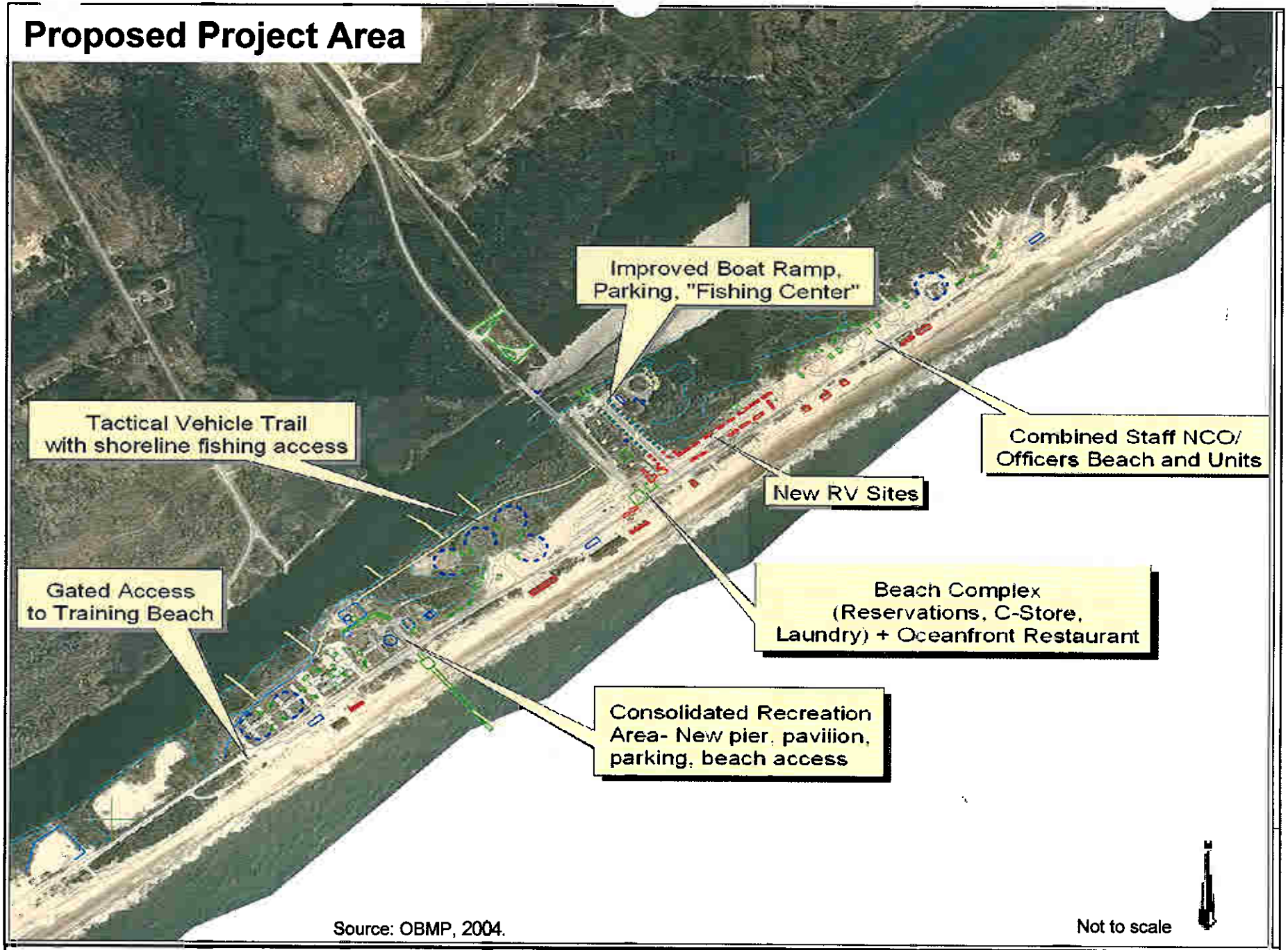

FIGURE 2-1
Onslow Beach EA

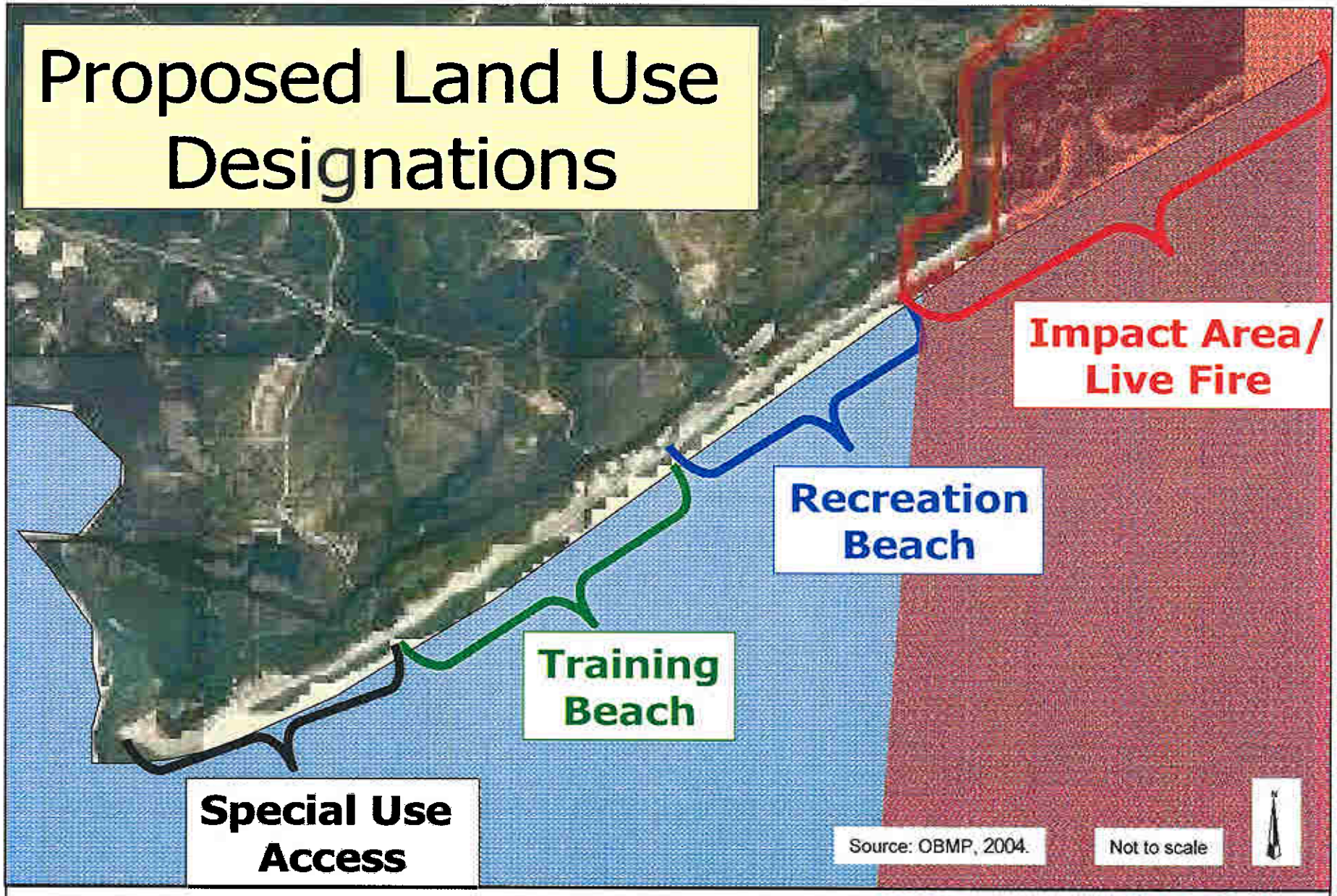

FIGURE 2-2

Onslow Beach EA

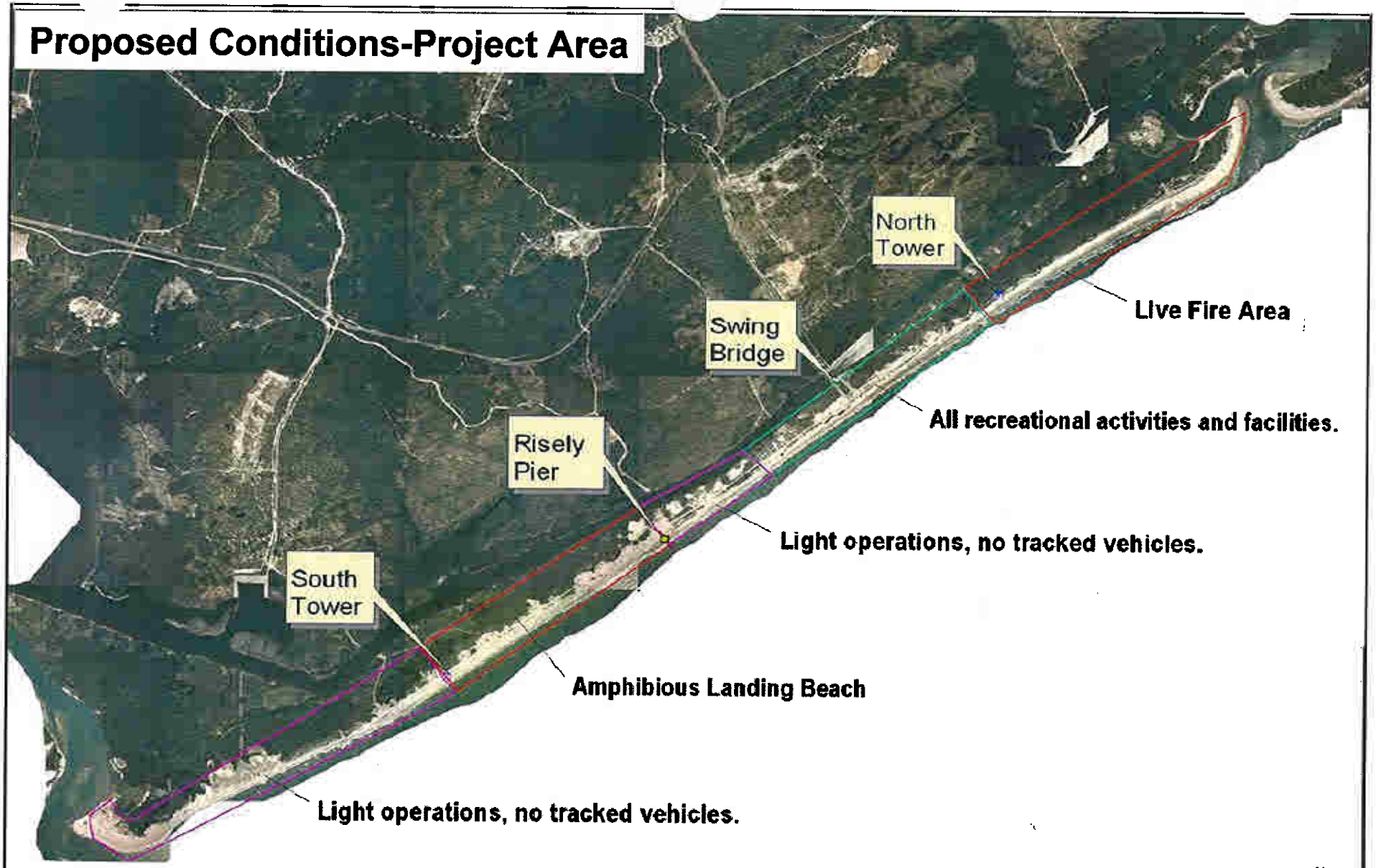

FIGURE 2-3
Onslow Beach EA

2.1.2 Construct Fence/Gate and Tactical Trail

To delineate the southern training area from the recreation area, a fence would be built where the paved road currently ends near the SOTG compound. A gate would be installed in the fence where it intersects Ocean Drive. This gate would limit access to the southern beach to military units and seasonally authorized recreational users.

To prevent the intermingling of recreational traffic and tactical vehicles on the main beach road, a gravel tactical trail (tank trail) would be constructed along the northwest side of the island from the base of the AIWW Bridge, behind the enlisted rental units, to the access gate described above. The trail would be open to tactical vehicles only. Pedestrian overpasses would be constructed to allow fisherman to access the AIWW. The proposed tactical trail alignment contains jurisdictional wetlands and the U.S. Army Corps of Engineers (USACE) would require mitigation for any wetland fill.

The fence/gate and tactical trail would have similar potential environmental impacts.

2.1.3 Harden Splash Points and Improve Boat Landing

Two splash points along the AIWW exist to allow amphibious vehicles to cross the waterway onto the Mainside of MCB Camp Lejeune. The first splash point is located on the corridor to Landing Zone Blue Bird and is identified as Splash Point 1 on Figure 2-3. The second splash point is located on the corridor to Landing Zone Albatross and is identified as Splash Point 2 on Figure 2-4. These splash points are currently sandy banks sloping into the waterway where the vegetation has disappeared, presumably due to years of use. The soils in these areas are typically compacted and eroded due to heavy vehicles driving over the area. Hardening amphibious splash points would help control the erosion. They would be constructed on both banks of the splash point using poured concrete and angled into the water, similar to a boat ramp. Riprap would be used around the ramps to reduce bank erosion.

Improvements to the boat landing would include a concrete ramp and short docks to aid in the launching and recovery of the boats. The docks would be made of pressure treated lumber and would extend from the land into the AIWW on pilings.

Both hardening the splash points and improving the boat landing are similar projects with similar potential environmental impacts on the bank and waters of the AIWW.

2.1.4 Relocate Pier and Convert Old Pier into Observation Deck

One of the major objectives of the OBMP is to eliminate conflicting uses in existing land use areas. One way to accomplish this is to remove recreational facilities from the designated training areas. Riseley Pier has been identified as a recreational facility that is currently located in a training area. Riseley Pier is approximately 250-300 ft long, reduced in length by several hurricanes over recent years. The Proposed Action would result in the elimination of the recreational function of Riseley Pier.

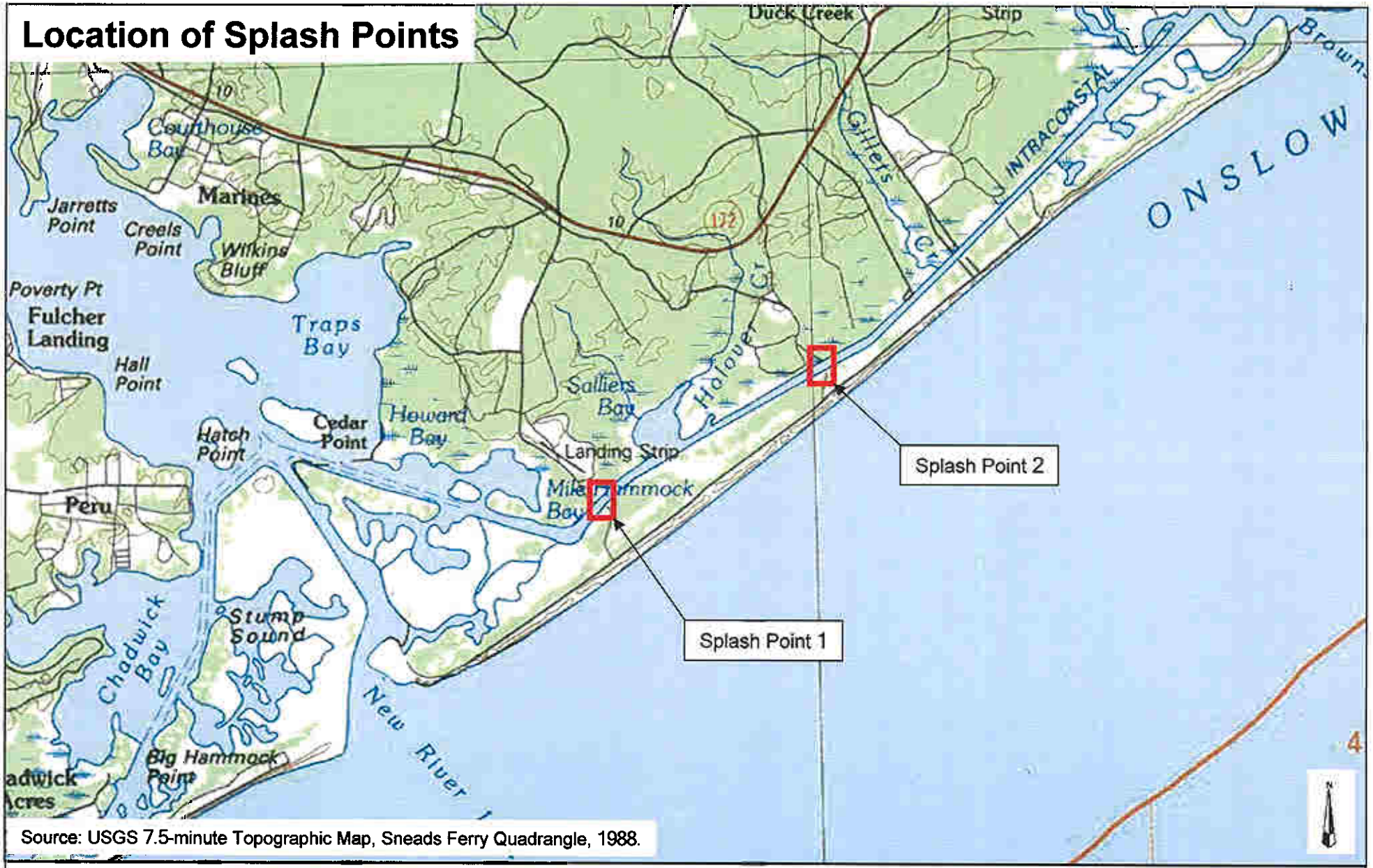

FIGURE 2-4

Onslow Beach EA

As a component of the Proposed Action a new 900-ft fishing pier would be constructed in the designated recreational area. Pier construction consists of jetting pilings into the ocean floor. The frame and decking, made from pressure treated lumber, would be attached to the pilings. The new pier would provide similar facilities found on the current pier. A bait and tackle shop would be built onto the base of the pier; and the pier would provide bench seating, restrooms, lighting, and fish cleaning tables with running water.

There are two options being considered for the disposition of existing Riseley Pier. The first option would involve partial demolition of Riseley Pier and conversion into an amphibious training observation deck. The structure would be approximately 100 ft in length, and would protrude into the ocean slightly. Only minor construction on existing pilings would be required. The second option would involve a complete removal of Riseley Pier and the construction of an observation deck immediately behind the dunes in the same area where Riseley Pier is currently located. This observation deck would be 50 ft in length, 15 ft wide, and would be constructed on pilings so that the deck would be 30 feet above the existing grade.

2.1.5 Improve Facilities in Recreation Area

Currently, some recreational facilities at Onslow Beach are in disrepair and/or do not meet the expectations of beach patrons. As a component of the Proposed Action old facilities would be demolished and/or removed and existing land would be used for the construction of improved recreational facilities. Very little new land would be developed to complete these new facilities.

This component of the Proposed Action contains many project sub-components. The project sub-components are being analyzed together within an overall footprint for recreational development. Since the OBMP covers the period encompassed by the Onslow Beach management and development, some specifics of the proposed locations and designs of these facilities may change. This PEA would be reviewed for adequacy when final designs for recreational facilities are available.

See Appendix B for architect's renderings of proposed Onslow Beach recreational development. A summary of recreational facility improvements follows:

- **Beach Lodging** - This would include demolishing or removing old facilities and replacing them with updated lodging units. Additionally up to 50 new units would be built to accommodate the high summer demand. Units would be 1, 2, and 3 bedrooms consisting of between 500 and 1,000 square feet.

- **RV/Tent Sites** – The area along Old Beach Road and on Ocean Drive directly north Onslow Beach Road currently has 26 RV and 15 tent sites. Up to 22 new RV sites would be added with electrical and water hookups.

- **Community Center** – A community center would be located at the foot of the new pier, southwest of the Onslow Beach Road/Ocean Drive intersection. This location is central

to the enlisted cabins. Facilities would include a putt-putt miniature golf course, horseshoe pits, basketball courts, picnic shelters, and a shower/restroom facility.

- **Beach Complex** – This area would be located at the intersection of Onslow Beach Road and Ocean Drive. The Beach Complex would include a reservation center/administration building, a laundry facility, and an approximately 3,000 sq ft Location Exchange (MILCON P-1090, FY05).

- **Oceanfront Restaurant** – An oceanfront restaurant, with a casual bar and grill atmosphere, would be constructed at the intersection of Ocean Drive and Onslow Beach Road.

- **Centralized Parking Area** – A large centralized parking area made of gravel, shell, and packed sand, would be built where Onslow Beach Road intersects Ocean Drive. This would provide parking for the beach complex, the oceanfront restaurant, and beach patrons.

- **Fishing Center** – This proposed fishing center would be located directly north of the foot of the pier where the current boat ramp is located on the AIWW. The existing boat ramp is in need of improvement and additional boat launching/recovering capability. The fishing center would include a fishing gear/non-motorized boat rental facility, a boardwalk, covered picnic pavilions, and an oversize parking area for vehicles with boat trailers. The new boat landing area would include a concrete ramp and short docks to aid in the launching and recovery of boats. The docks would be made of pressure treated lumber and would extend from the land into the AIWW on pilings. This would allow Marines and their families to easily launch and recover their boats from the trailer.

- **Road Realignment** – The northern portion of Onslow Beach Road, near its intersection with Ocean Drive, would be realigned to accommodate the proposed recreational facilities. Other parts of Ocean Drive may also undergo slight realignment, especially in the area of the Community Center.

The redevelopment would fulfill the recreational demand for improved facilities to serve base personnel and their families. The design for facilities would favor the continuation of existing scenic recreational values of Onslow Beach.

2.1.6 Promote Outdoor Recreation

Enhancements to outdoor recreation would include creating nature trails and observation platforms with interpretive signage; constructing pedestrian and bike paths; and building duck blinds on the current waterfowl impoundment. These enhancements are generally low impact. The nature trails, observation platforms, and pedestrian/bike paths would be within the proposed recreation area. Duck blinds would be built on the currently used waterfowl impoundment located in the proposed training area, adjacent to the Onslow South Tower. Hunters would have access to this area through the proposed gate by seasonal permit only. Waterfowl hunting is and would be conducted within the hunting management measures

outlined in MCB Camp Lejeune's INRMP (2001). The INRMP is currently being revised and the draft version can be accessed at this website: http://www.lejeune.usmc.mil/emd.

In addition, many other outdoor activities such as fishing, boating, surfing, swimming, beachcombing, horseshoes, miniature golf, basketball etc. are encouraged and supported by the proposed facilities and environment at Onslow Beach. These activities are generally low impact, taking advantage of and promoting the protection of the unique coastal environment at Onslow Beach.

2.1.7 Upgrade Utilities

The current capacity of the utilities and wastewater treatment facilities are adequate to accommodate the proposed/anticipated future growth of Onslow Beach. The infrastructure would need to be maintained and upgraded as necessary to meet future requirements. Upgrading would involve the replacement of pumps and/or pipelines. No new land would be disturbed. MCB Camp Lejeune would comply with all applicable federal, state, and local laws when final specifications and plans are available.

2.1.8 Implement Additional Conservation Practices

The OBMP outlines a number of conservation practices for the coastal ecosystem (see OBMP Section 4.1.3 *Natural Resource Conservation*). Some of these conservation practices are restated or slight modifications to the practices outlined in the MCB Camp Lejeune INRMP (2001). Other practices outlined in the plan are designed to minimize impacts to military training associated with the proposed development of Onslow Beach.

As stated in Section 1.1.3 *Related Environmental Documents*, MCB Camp Lejeune's INRMP outlines sea turtle nesting, piping plover and other shorebirds, waterfowl, seabeach amaranth, and dune stabilization management practices. Additionally, conservation practices discussed in *Biological Assessment and Opinion on the Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach* (2002) (see Section 1.1.3) are incorporated into the OBMP.

Overall, conservation practices outlined in the OBMP that would be implemented are:

- **Control Invasive Species**. The OBMP proposes to control invasive species such as cattails (*Typha* spp.) and common reed (*Phragmites australis*) in wetlands to prevent establishment. These invasive species can be controlled with a combination of cutting, prescribed burning, and spraying of an aquatic weed herbicide such as Rodeo®.

- **Stabilize Dune/Beach.** Dune stabilization measures in training and recreational areas would continue under the OBMP according to the Biological Assessment and Opinion on the Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach (2002). The use of sand fencing, planting native beach grasses, and placing Christmas trees in the dunes would help stabilize the dune system.

- **Remediate Light-Pollution**. Artificial lighting on beaches disrupts behaviors of nesting and hatchling sea turtles. All new construction would incorporate fixtures that minimize ambient lighting by directing the light only where it is needed. Lighting problems would be remedied according to the guidelines presented in *Technical Report – Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches* (Witherington et al., 2000). In the interim, before new construction would begin, all external lighting would be modified to comply with the guidance found in this report.

- **Apply Seasonal Restrictions to ORRVs in Conservation Areas**. Due to the narrowing beach and threatened and endangered species habitat, ORRV restrictions are placed on Onslow Beach. ORRV driving is currently restricted to only the area between the Riseley Pier and the New River Inlet (BO 11017.1F). Restrictions from the Riseley Pier to the South Tower include daytime ORRV use from April 1 to October 31 and day and nighttime use from November 1 to March 31 if no training is scheduled. In the area between the South Tower and the New River Inlet, ORRV use from April 1 to August 31 is prohibited. During September 1 to October 31 ORRV use is allowed during daylight hours and November 1 to March 31 ORRV use is allowed during day and night hours. The ORRV Base Order prohibits driving on vegetation, restricts access to the beach strand to designated ingress/egress points, and restricts vehicles on the beach strand to the area seaward of a set of markers placed between the high tide line and the first line of vegetation (MCB Camp Lejeune 2005).

- **Restore Native Vegetation.** Currently, the recreational beach is severely lacking the scrub-shrub habitat native to the coastal environment in this region. The OBMP proposes to connect existing habitats, where practical, along the length of Onslow Beach by planting native vegetative buffers throughout the recreational beach. Native vegetation buffers would also be included in all site plans. These areas are important to maintaining the ecology of the system by providing food and cover for wildlife, soil stabilization, and water filtration functions. High quality waters surround Onslow Beach, and therefore vegetative buffers are crucial for stormwater management to stabilize the soil and impede water from storm events.

2.2 No-Action Alternative

Under the No-Action Alternative, unsegregated military training and recreational uses would continue on Onslow Beach. Maintenance and repair of facilities would continue. The No-Action Alternative does not meet the purpose for the Proposed Action. The use conflicts would continue with significant strain on military training, public safety, and recreation.

The No-Action Alternative is evaluated in this PEA to provide a measure of the baseline conditions against which the impacts of the Proposed Action can be assessed in accordance with the CEQ's NEPA implementation regulations.

2.3 Alternatives Considered but Dismissed

Besides the Proposed Action, other alternatives were considered but dismissed from further consideration in this document because they did not meet the intended purpose of the project (see Section 1.4 *Purpose of the Proposed Action*).

In addition to the Proposed Action of implementing the OBMP, the following alternatives were considered by the Marine Corps:

- Designate and redevelop Onslow Beach into one military training area; recreation not allowed.

- Designate and redevelop Onslow Beach into one recreation beach; military training not allowed.

The true benefit of Onslow Beach is that its unique natural features make it ideal for both military training and recreation. Both military training and recreation can coexist. Onslow Beach provides the environment to support critical training opportunities for the Department of Defense. There are no other east coast military installations that provide the full range of "across the beach" training resources. Additionally, if recreational opportunities were not allowed on Onslow Beach, the morale of military personnel and their families would be adversely impacted. Onslow Beach is a recreational asset for the Marine Corps. For the above reasons, the alternatives above are not considered reasonable alternatives and their impacts are not analyzed in this EA.

Alternatives briefly considered for individual project components include rehabilitating the current Riseley Pier; building an additional bridge crossing the AIWW strictly for tactical vehicles, which would eliminate the need for all or most of the tactical trail; and locating the lodging reservation office to the mainside of the AIWW Bridge. These project component alternatives were not considered further because they did not meet the purpose of the Proposed Action.

2.4 Summary of Environmental Effects of Alternatives

Only the Proposed Action meets the purpose and need and all screening criteria. Table 2.1 summarizes the adverse and beneficial impacts of both the Proposed Action and No Action alternative. The impacts are further discussed in Chapter 4, Environmental Consequences.

Table 2-1 Summary of the potential environmental effects from implementation of the No-Action Alternative and the Proposed Action.

Resources	No-Action	Proposed Action
Land Use and Coastal Zone Management	No new or adverse impacts to Land Use or Coastal Zone Management. However conflicts between training areas and recreational areas would still exist.	Improvements to land use would result from the re-designation of land as part of Proposed Action. Minor short-term impacts to the surrounding waters of Onslow Beach and barrier island would result from the Proposed Action. Minor impacts would occur during implementation of the OBMP.
Navigation	No new or adverse impacts to navigation.	No new or adverse impacts to navigation.
Environmental Justice	No new or adverse impacts to Environmental Justice.	No impacts to low income or minority populations or to children.
Traffic	No new or adverse impacts to traffic. However the current congestion between the AIWW Bridge and recreation area would continue.	Improvements to military vehicle and beach patron traffic along Onslow Beach Road and Ocean Drive would result from the Proposed Action.
Air Quality	No new or adverse impacts to air quality.	Minor impacts to air quality would occur during construction of the pier, trails, and recreational areas. No change in long-term air emissions would be anticipated because the basic use of the proposed area would remain the same.

Noise	No new or adverse impacts to noise.	Minor noise impacts would occur during construction/renovation work. No change in long-term noise level would be anticipated because the basic use of the proposed areas would remain the same.
Cultural Resources	No new or adverse impacts to cultural resources.	No significant impacts would occur during the construction or operation phase of the Proposed Action to cultural resources.
Soils and Topography	No new or adverse impacts to soils or topography.	Minor impacts to soils and topography would occur during the construction of the new pier and observation deck.
Wildlife and Vegetation	No new or adverse impacts to wildlife or vegetation.	Minor short-term impacts to wildlife and vegetation would result from the construction of the new pier, observation deck, and recreational facilities. Long-term impacts are not expected due to the conservation and mitigation measures that are part of the Proposed Action.

Threatened and Endangered Species	No new or adverse impacts to threatened or endangered species.	Minor short-term impacts to threatened and endangered species during the construction phase of the Proposed Action may occur. Conservation and preservation measures implemented by the Proposed Action would have beneficial long-term impacts.
Water Quality	No new or adverse impacts to water quality.	Minor short-term minor impacts would result from the construction of the new pier. Operation of a new pier would have similar effects as the current Riseley Pier.
Wetlands	No new or adverse impacts to wetlands.	Fence and gate and tactical trail installation could require filling wetlands. Impacts to wetlands would be avoided or minimized and mitigated in accordance with terms of the applicable wetland permit.
Floodplains	No new or adverse impacts to floodplains.	Minor impacts may occur to the proposed recreational facilities that will be within the 100-year floodplain.
Safety	No new or adverse impacts to safety. However safety of beachgoers and military personnel would continue to conflict along the beach and roadways.	Significant improvements to safety would result from the Proposed Action.

3 AFFECTED ENVIRONMENT

3.1 Land Use and Coastal Zone Management

3.1.1 Land Use

Land use at Camp Lejeune consists of training areas, water, impact areas, developed areas, unique natural habitat areas, and roads. The majority of the Base's land use is devoted to training ranges and maneuver areas. This reflects its primary mission, to maintain combat ready units for deployment.

Onslow Beach is currently divided into three different regions: a recreational area with beach access for the public, a training area, and a special use area. The recreational area and the training area overlap with each other, which poses a problem during training activities.

3.1.2 Coastal Zone Management

The coastal zone is rich in natural, commercial, recreational, ecological, industrial, and aesthetic resources. As such, it is protected by legislation for the effective management of its resources. The Coastal Zone Management Act (CZMA) of 1972 (16 USC § 1451, et seq., as amended) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in the coastal zone.

CZMA policy is implemented through state coastal zone management programs. Federal lands are excluded from the jurisdiction of these state programs. However, activities on federal lands are subject to CZMA federal consistency requirements if implementation of the federal activity would affect any land or water or natural resource of the state's coastal zone.

The North Carolina Coastal Area Management Act (CAMA) of 1974 was passed in accordance with the federal CZMA. It established a cooperative program of coastal area management between local and state governments. General policy guidelines issued by North Carolina for the coastal area address the following items:

- Shoreline erosion policies
- Shorefront access policies
- Coastal energy policies
- Post-disaster policies
- Floating structure policies
- Mitigation policy
- Coastal water quality policies
- Policies on use of coastal airspace
- Policies on water and wetland based target areas for military training areas

- Policies on beneficial use and availability of materials resulting from the excavation or maintenance of navigational channels
- Policies on ocean mining

While it is the local governments who have the initiative for planning under the CAMA, the state has designated areas of environmental concern in the following four broad categories:

- Estuarine and ocean systems
- Ocean hazard areas
- Public water supplies
- Natural and cultural resource areas

The CAMA requires local governments in each of North Carolina's 20 coastal counties to prepare and implement a land use plan and ordinances for its enforcement. Upon approval by the North Carolina Coastal Resources Commission, each plan becomes part of the State of North Carolina's Coastal Management Plan. Coastal zone management policies adopted in each plan must be consistent with the enforceable state and federal policies. Specifically, policy statements are required on resource protection; resource production and management; economic and community development; continuing public participation; and storm hazard mitigation, post-disaster recovery, and evacuation plans.

Onslow County recently updated its Land Use Plan in conformity with the CAMA (Onslow County, February 2000). The county has zoning control applicable to only one special area, Golden Acres in Stump Sound Township. The county does, however, require review of subdivisions, providing for minimum design standards, enforced by the county Planning Department. Incorporated areas within the county implement their own zoning regulations.

3.1.3 Coastal Barrier Resources Act

The Coastal Barrier Resources Act (CBRA) of 1982 (16 U.S.C. 3501-3510) as amended by the Coastal Barrier Improvement Act of 1990 (16 U.S.C. 3501 et seq.) established a policy that protects coastal barriers, in certain geographic areas of the U.S., by restricting federal expenditures that encourage development of coastal barriers. The intent of the law was to minimize loss of human life, wasteful expenditure of federal funds, and damage to fish, wildlife and other natural resources associated with the development of coastal barriers. With the exception of specifically exempted projects (e.g. dredging, federal navigation projects, habitat enhancement, and management efforts), no new federal expenditures or financial assistance are allowed for areas within the system. Onslow Beach is within the Coastal Barrier Resource System (CBRS) except for the recreational area along Ocean Drive both southwest and northeast of the intersection with Onslow Beach Road. Figure 3-1 references the CBRS at Onslow Beach.

3.2 Recreation

Recreational activities in the Onslow Beach area include swimming, surfing, sailing, wind surfing, water skiing, canoeing, kayaking, jet skiing, boating, snorkeling, and offshore diving. In addition, MCCS operates a miniature golf course, and Riseley Pier has bait and

FIGURE 3-1

Onslow Beach EA

tackle shop Section 1.1.2 describes the current recreational facilities that exist at Onslow Beach. Fresh and salt-water fishing are popular as well as recreational pursuit of migratory waterfowl, other migratory game birds, white tailed deer and small mammals.

Recreational activities in Onslow Bay primarily comprise game and sport fishing, charter boat fishing, sport diving, whale watching, sailing, power cruising, and other recreational boating activities. Recreational fishing and other recreational boats range throughout the North Carolina coastal waters, depending on season and weather conditions.

Most recreational fishing and boating, however, occurs within a few miles of shore. Sport diving generally is geographically restricted to more shallow waters, closer to shore.

Approximately 20 artificial reefs (fish havens) have been established in Onslow Bay (NCDMF 2002), primarily to support offshore sport fishing and recreational diving (Natural Resource Consultants 1997). Although recreational vessels and commercial chartered boats utilize the artificial reefs throughout the year, use is highest during the summer.

Off-Road Recreational Vehicles affect habitat for threatened and endangered species, such as the sea turtles and seabeach amaranth, and habitat for shorebird communities. ORRV driving is currently restricted to only the area between the Riseley Pier and the New River Inlet. Restrictions from the Riseley Pier to the South Tower include daylight driving from April 1 to October 31 and day and nighttime driving from November 1 to August 31 if no training is scheduled. In the area between the South Tower and the New River Inlet, ORRV use from April 1 to August 31 is prohibited. During September 1 and October 31 ORRV use is allowed during daylight hours and November 1 to March 31 ORRV use is allowed during day and night hours. The ORRV Base Order (BO 11017.1F) also prohibits driving on vegetation, restricts access to the beach strand to designated ingress/egress points, and restricts vehicles on the beach strand to the area seaward of a set of markers placed between the high tide line and the first line of vegetation (MCB Camp Lejeune 2005). For more information on recreational issues, see the OBMP (MCB Camp Lejeune 2004).

The USMC conducts ongoing boat and amphibious training and readiness operations at Camp Lejeune. Most of these operations occur on the New River, Pamlico Sound, or within Onslow Bay, involving use of the AIWW for travel between these areas. Several such operations occur every day, and involve one or more boats during a normal training week. These training boats generally share these waterways with commercial and recreational water traffic. In some instances, the USMC will close surface danger zones and restricted areas within the AIWW and Onslow Bay to prevent civilians and other non-participating craft from entering the operations area. There are currently about 50 operations per year that require closure the AIWW within the surface danger zones of established training areas. These closures occur about 110 times, normally in increments of one-hour periods. However, specially coordinated events can close the AIWW for as long as 4 hours for 2 separate periods in 24 hours (8 hours total). Camp Lejeune is authorized to close the AIWW at any time for as long as is deemed necessary for military training, consistent with 33 CFR Part 334 (Danger Zone and Restricted Area Regulations). Part 334.440 specifies USMC firing ranges in New River, North Carolina, and vicinity; lists the specific danger zones and

restricted areas and their boundaries, and prescribes specific requirements, access limitations, and controlled activities.

3.3 Environmental Justice and Impacts on Children

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," directs each federal agency to incorporate environmental justice into its mission and activities. Each federal department and agency is to accomplish this by conducting programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude communities from participation in, deny communities the benefits of, or subject communities to discrimination under such actions, because of their race, color, or national origin.

EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks," requires each federal agency to identify and assess environmental health and safety risks to children. "Environmental health and safety risks" are defined as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest."

Onslow County is approximately 770 sq miles (2000 sq km) and has a population of 150,000. The county seat and primary commercial center of Onslow County is the city of Jacksonville, which borders Camp Lejeune to the north. Jacksonville encompasses about 43 square miles (100 sq km), and is responsible for most of Onslow County's population growth in recent years. Jacksonville's population rose from 30,000 in 1990 to 67,000 in 2000, while the population of Onslow County has remained stable. West Onslow Beach, located out of the New River inlet, is a rapidly growing resort community and the second largest developed area in Onslow County.

Table 3-1 presents the ethnic characteristics of Onslow County compared to the state of North Carolina. As shown, the minority populations represent a relatively small proportion of the total population. Compared to the state of North Carolina as a whole, the county has generally similar population ethnicity characteristics. The largest relative difference is the greater percentage (7.2 percent) of Hispanics or Latinos residing in the county compared to the state. The relative proportions of the three other ethnicities are similar or lower in Onslow County in comparison to all of North Carolina.

Table 3-1 Race and Ethnicity 2000 (percent)

Jurisdiction	Caucasian	African American	Other Non-Caucasian	Hispanic
Onslow County	72.1	18.5	6.2	7.2
Jacksonville City	63.9	24	8.5	10
North Carolina	72.1	21.6	6.2	4.7

Source: US Census 2000.

As shown in Table 3-2, Onslow County has considerably lower household and family income levels than the state as a whole. These county income levels are respectively about 14 percent and 21 percent less than the state levels. However, the county percentages of the number of persons in poverty are comparable to those of North Carolina.

Table 3-2 Income 2000

Jurisdiction	Median Household Income	Median Family Income	Percent of Persons Below Poverty
Onslow County	33,756	36,692	12.9
Jacksonville City	32,544	33,763	14.1
North Carolina	39,184	46,335	12.3

Source: US Census 2003.

In 2000, the majority of the population of Jacksonville was Caucasian (64 percent), with 24 percent African American, and 10 percent Hispanic. The City of Jacksonville had a median household income of $32,544 compared to the regional (Onslow County) figure of $33,756 and the North Carolina figure of $39,184.

Children are potentially present at Camp Lejeune at family housing, medical facilities, places of worship, childcare centers and beach recreation areas. However, training areas are restricted and secure; no children or other civilians are permitted in areas of active training. Construction of the tactical trail would enhance children's safety by deconflicting military and recreational vehicle traffic near the recreational beach.

3.4 Infrastructure

3.4.1 Traffic

Transportation refers to automobile traffic moving along highways and local roadways, including on-base traffic.

MCB Camp Lejeune contains approximately 222 and 635 mi (357 and 1,022 km) of improved (paved) and unimproved (gravel or dirt) roads, respectively. Improved roads include state maintained highways such as Highways 17, 172, and 24. The unimproved

roads are primarily used only by Base authorized-personnel for access to training areas, ranges, and the impact areas. There is one main access road (Onslow Beach Road) to Onslow Beach. Ocean Drive runs the length of the Onslow Beach and is used by both Marine amphibious vehicles and public traffic. Not only does this situation cause bottlenecks during training activities in this area of the beach, but also has resulted in several potentially dangerous interactions between recreational users and tactical vehicles.

3.4.2 Utilities

The capacity of the current wastewater treatment plant is about 250,000 gallons a day and a potable water usage averages about 50,000 gallons a day. Therefore the existing wastewater treatment plant capacity is adequate. Electricity is served by a 600 amp line which operates at 65% capacity. Current utility capacities are adequate to support the current and proposed development at Onslow Beach. Utility lines at Onslow Beach are currently overhead on utility poles.

3.4.3 Navigation

The Marine Corps conducts ongoing boat and amphibious training operations at MCB Camp Lejeune. Most of these operations occur on the New River, Pamlico Sound, or within Onslow Bay, with use of the Atlantic Intracoastal Waterway (AIWW) for travel between these areas. Several such operations occur every training day (most weekdays), involving one to several boats. These maneuvers generally share the waterways with commercial and recreational water traffic. In some instances, the Marine Corps closes restricted areas within the AIWW and Onslow Bay to prevent civilians and other non-participating craft from entering these areas. MCB Camp Lejeune can close these areas at anytime pursuant to 33 CFR Part 334 (Danger Zone and Restricted Area Regulations).

Section 10 of the Rivers and Harbors Act of 1899 provides authority to the United States Army Corps of Engineers to issue or deny permits for the construction of dams, dikes, or other structures affecting navigable waters of the United States.

3.5 Air Quality

The U.S. Environmental Protection Agency (USEPA), under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants, referred to as criteria pollutants (40 CFR 50). These are: carbon monoxide, nitrogen dioxide, ozone, particulate matter, lead, and sulfur dioxide. The NCDENR has adopted the USEPA's NAAQS as the statewide ambient air quality standards.

Areas that meet the NAAQS standard for a criteria pollutant are designated as being in "attainment"; areas where the criteria pollutant level exceeds the NAAQS are designated as being in "nonattainment". MCB Camp Lejeune and Onslow County are located in the Southern Coastal Plain Intrastate Air Quality Control Region, which is defined in 40 CFR Part 81.152, and is comprised of 13 counties. Pursuant to 40 CFR 81.334, each of the 13

counties that make up the Region has been designated as being in attainment for all criteria pollutants.

The USEPA published the final rules on general conformity that apply to federal actions in areas designated as being in nonattainment for any of the criteria pollutants under the CAA (40 CFR Parts 51 and 93) in the November 30, 1993 *Federal Register*. Since the Proposed Action would occur within an attainment area, the general conformity rules are not applicable.

3.6 Noise

Noise is defined as unwanted sound. The Noise Control Act of 1972 (Public Law 92-574 1972) states "...that it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare" and that federal agencies "(1) having jurisdiction over any property or facility, or (2) engaged in any activity resulting, or which may result, in the emission of noise, shall comply with federal, state, interstate, and local requirements..." [Section 4(b)]. In Section 6 of the Act, the Administrator of the USEPA is directed to establish noise emission standards for products and to prescribe regulations for such products. However, in Section 3, Congress excluded any military weapons or equipment that are designed for combat use from the definition of 'product'.

Noise is measured in units called decibels (dB). Noise levels from a single event, such as a weapon firing or an explosive detonation, are useful to predict the annoyance and potential complaints caused by these events. Single-event noise levels are often described in terms of the peak sound level in decibels (dBP). This descriptor is normally based on the loudest weapon system used within a range. Noise levels attenuate (i.e. become quieter) over the distance between the transmitter (weapon) and the receiver (ears). For large caliber weapons (> 25 mm) and explosions, received peak noise levels below 115 dBP are unlikely to annoy most people and, therefore, have a low risk of noise complaints (LANTDIV 2002).

In accordance with DoD noise study standards, Wyle Laboratories developed DNL noise contours based on average annual daily operations and busiest month scenarios for both ordnance and airspace operations within the Greater Sandy Run Area (GSRA) and G-10 areas during 2000. The noise contours were incorporated into the May 2002 *Final Range Compatible Use Zone (RCUZ) Study for MCB Camp Lejeune, North Carolina* (LANTDIV 2002), with the intention of promoting compatibility between existing and proposed land uses and activities, both on- and off-base. The RCUZ study describes existing and projected training operations, discusses the RCUZ guidelines for land use compatibility, identifies incompatible land uses in the vicinity of the Base, and suggests methods for implementing measures to prevent or rectify these issues.

Manmade noise at Onslow Beach is generated by a number of activities including amphibious assault training, tactical vehicle movement, and ordnance firing in the N-1/BT-3 impact area. Recreational activities especially ORRV driving also generates noise. The natural noise environment is dominated by the sound of surf and wind.

3.7 Cultural Resources

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the National Historic Preservation Act of 1966 empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, funded, or permitted projects affecting cultural sites listed or eligible for inclusion on the National Register of Historic Places (NRHP). Once cultural resources have been identified, they are evaluated for their eligibility for inclusion into the NRHP. If the resource is determined to be eligible, an assessment is undertaken to identify any impacts that may result due to the proposed action. Only cultural resources determined to be significant (i.e., eligible for the NRHP) are protected under the National Historic Preservation Act.

Only one archeological site has been found at Onslow Beach, and it is in an area with no planned development. This site is near the southwest end of the beach and per the OBMP is zoned for training and conservation. Therefore, control of the site would be more easily accomplished. Operations or exercises on or around marked/signed sites require coordination with the Base Archaeologist and tracked vehicles are restricted to existing trails. This site is eligible for inclusion on the NHRP.

The site is a prehistoric Early through Late Woodland occupation and is buried approximately 1.25 meters beneath sandy beach matrix. The site does experience some periods of erosion resulting from periodic storms at the mean high tide mark. A preliminary recommendation has been made to the State Historic Preservation Officer for inclusion of the site into the National Registrar.

3.8 Natural Resources

3.8.1 Geology, Soils and Topography

Camp Lejeune is located in the Coastal Plain of North Carolina. Elevations on Camp Lejeune range from sea level to 72 ft (22 m) above mean sea level, averaging 15 to 40 ft (5 to 12 m). Surface relief ranges from flat marshlands to low, gently rolling hills further inland. The Onslow Beach portion of Camp Lejeune represents a barrier island approximately 11 miles (18 km) long, extending northeast from the New River Inlet to Bear Inlet. Brown's Island comprises the northern third of this area.

Hurricanes and even lesser storms are the most destructive natural disturbance on the barrier islands. The Atlantic hurricane season lasts from June 1st to November 30th and includes an average of 5.4 hurricanes a year. Not all of course impact Onslow Beach. Erosion caused by storm activity threatens the long-term utilization of Onslow Beach as an amphibious training exercise facility. This is a chronic problem. In response to this issue, the Environmental Conservation Branch has sponsored a dune restoration project in the recreational and training areas of the Onslow Beach since 2001. For more information on hurricanes and beach erosion see the *Beach Erosion and Hurricane Protection Plan* (Cleary & Riggs 1999).

Soils on Onslow Beach range from coarse shifting sands to young, sandy soils. Soils series include Newhan, Corolla, Duckston and Fripp. Newhan fine sand is excessively drained and range from 0 to 30 percent slopes. Corolla fine sand are moderately well drained soils with slopes ranging from 1 to 3 percent. Duckston fine sand is poorly drained with slopes of 0 to 2 percent. The Fripp series is very deep, excessively drained soils with slopes of 2 to 30 percent. For more information on these soils series see the OBMP (April 2006). The INRMP provides a detailed map of the distribution of soil types on Camp Lejeune (MCB Camp Lejeune 2001).

3.8.2 Terrestrial Wildlife and Vegetation

Onslow Beach provides excellent habitat for many varieties of wildlife. Terrestrial animal species found on Onslow Beach are listed in the OBMP, Section 2.2.2.

Wildlife species at Onslow Beach are habituated to higher levels of noise resulting from training and recreation activities, such as ORRV use at the site. There is already a human presence at the beach. The INRMP provides additional discussion of the status and management of these species on Camp Lejeune (MCB Camp Lejeune 2001).

3.8.3 Marine Animals

3.8.3.1 Mammals

All marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972. The MMPA makes it illegal to "take" a marine mammal. The definition of take refers to the harassing, injuring or killing of any marine mammal, or the possession of any marine mammal or part of a marine mammal, without authorization.

Cape Hatteras, North Carolina, is generally considered to be a range boundary between many tropical and temperate marine species in the western Atlantic. Thus, it is not surprising that the greatest diversity of marine mammals off the East Coast of the United States is found in this region. Four orders and 38 species of marine mammals have been reported or may occur here. Most are members of the order Cetacea, comprising whales, dolphins and porpoises. Of these, 26 species belong to the suborder Odontoceti, or toothed whales, which include dolphins and porpoises. Another seven species belong to the suborder Mysticeti, baleen whales. The order Pinnipedia, comprising seals and sea lions, is represented by four species, all members of the suborder Phocidae (some authorities consider Pinnipedia a suborder of Carnivora). Only one species, the Florida manatee (*Trichechus manatus latirostris*), falls into the order Sirenia.

In general, a majority of marine mammal species found off Camp Lejeune, which is southwest of Cape Hatteras, are associated with warm temperate or tropical waters. The more northern species that have been reported here represent either the southern limits of cold temperate to polar species or the extra limited occurrence of such species.

In 2002, the DON estimated densities of marine mammals in the Cherry Point Operating Area, which includes the project site. This operating area extends from about 3 nm (4 miles

[6 km]) off the coast to as much as 98 nm (113 miles [182 km]) east (seaward) of Cape Hatteras and even farther offshore to the south. Nearly the entire offshore boundary lies beyond the 6,562 ft (2,000 m) isobath. To the north, the Cherry Point Operating Area extends southeast from offshore of some of the barrier islands immediately north of Cape Hatteras. The southern boundary stretches to the south from a point southwest of Camp Lejeune. In all, the operating area encompasses 24,434 mi² (63,285 km²).

This study revealed that four species reported along the continental shelf section of the operating area accounted for 76.6 percent of all marine mammal sightings made during surveys conducted over a period of many years. These species included the bottlenose dolphin (*Tursiops truncatus*), the Atlantic spotted dolphin (*Stenella frontalis*), the northern right whale (*Eubalaena glacialis*), and the humpback whale (*Megaptera novaeangliae*). Off-shelf species, which were well beyond the project site, included the Atlantic spotted dolphin, the bottlenose dolphin, and at least six other species: the sperm whale (*Physeter macrocephalus*), pilot whales (*Globicephala* spp.), Risso's dolphin (*Grampus griseus*), the short-beaked common or saddleback dolphin (*Delphinus delphis*), and pygmy and dwarf sperm whales (*Kogia* spp.). These species accounted for 75.5 percent of the sightings. In all, the DON study identified 18 species that were known to occur in the Cherry Point Operating Area (DON 2002c).

3.8.3.2 Sea Turtles

All sea turtles that occur in the U.S. are listed under the ESA as either threatened or endangered. No critical habitat has been established for sea turtles in the U.S. The severe decline of nesting populations worldwide has led to six species being placed on the World Conservation Union (formerly International Union for the Conservation of Nature and Natural Resources) List of Threatened and Endangered Species. The seventh species of sea turtle, the flatback (*Natador depressus*), is found mainly in the waters of Australia, where it is protected by law except from aboriginal harvest (Lutz and Musick 1997).

In 1974, a sea turtle monitoring program was initiated at Camp Lejeune. A 14-mile (23 km) stretch of beach was monitored so that nests could be protected or relocated during the nesting and hatching season, from May through November. This program remains in place to this day (USMC 2003a and b).

In 1980, a turtle sanctuary was established that included Onslow Beach, Camp Lejeune (from New River to Bogue Inlet), and Brown's Island and Bear Island, also in North Carolina (15A NCAC 03R.0101 Amended August 1, 2004). This was the first turtle sanctuary in the U.S. The sanctuary extended up to 1.6 nm (2 miles [3 km]) offshore (DON 2002a). Also, the North Carolina Wildlife Resource Commission established the state's Sea Turtle Protection Plan under Section 6 of the ESA and under an agreement with the USFWS. Under this program, monitors checked nesting beaches, gathered data and helped manage and protect turtle nesting areas.

3.8.4 Threatened and Endangered Species

3.8.4.1 Federally Listed Species

The Endangered Species Act (ESA), 16 USC §§ 1531 et seq., prohibits the taking (i.e., harming) of any species listed by the USFWS as being either threatened or endangered. Endangered species is defined by the ESA as any species that is in danger of extinction throughout all or a significant portion of its range. Threatened species is defined by the ESA as any species that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range. Harming such species includes not only direct injury or killing, but also disrupting the habitats on which they depend. Any violation of the ESA resulting from the proposed action would be a significant impact. There are five federally listed species potentially found in the Onslow Beach area, each is discussed in the following paragraphs.

Seabeach Amaranth

The federally threatened seabeach amaranth is an herbaceous plant which colonizes and stabilizes the areas seaward of primary dunes, growing closer to the high tide line than any other coastal plant (MCB Camp Lejeune 2001). It emerges on sand dunes, inlets, and over-wash flats in summer and early fall. Because it is an annual, it is rarely seen in the same location for two consecutive seasons. The most persistent locations for seabeach amaranth have been in the vicinity of the New River Inlet and in the vicinity of Onslow North Tower (see Figure 3-2). The most significant threats to seabeach amaranth are beach stabilization structures, beach erosion, beach grooming, herbivory, and off-road recreational vehicles (MCB Camp Lejeune 2001). Management of this species on Camp Lejeune consists of annual surveys and the marking of occupied sites to prevent damage by people and vehicles (MCB Camp Lejeune 2001). An area of Onslow Beach is designated for amphibious vehicle use. This area does not provide suitable habitat for the species. It is not likely to occur there, because of ongoing disturbance by vehicles and personnel.

Piping Plover

Piping plovers are migratory birds that forage on insects and other invertebrates in open sandy to muddy areas near the water's edge on coastal and inland beaches. They nest in sparsely vegetated dunes just above the high-water level. Although Onslow Beach is utilized as a foraging and resting area, no nesting has been documented on Camp Lejeune. Piping plovers may occur temporarily in designated landing and transit areas used by amphibious vehicles, but the ongoing level of activity makes it unlikely that any birds would attempt to nest there. Camp Lejeune conducts breeding season surveys and is committed to the protection of any piping plover nests that are discovered on the installation (MCB Camp Lejeune 2001).

American Alligator

The threatened American alligator is found in the waters surrounding Camp Lejeune and has been sighted in the New River watershed and AIWW (Camp Lejeune 2002a). No current

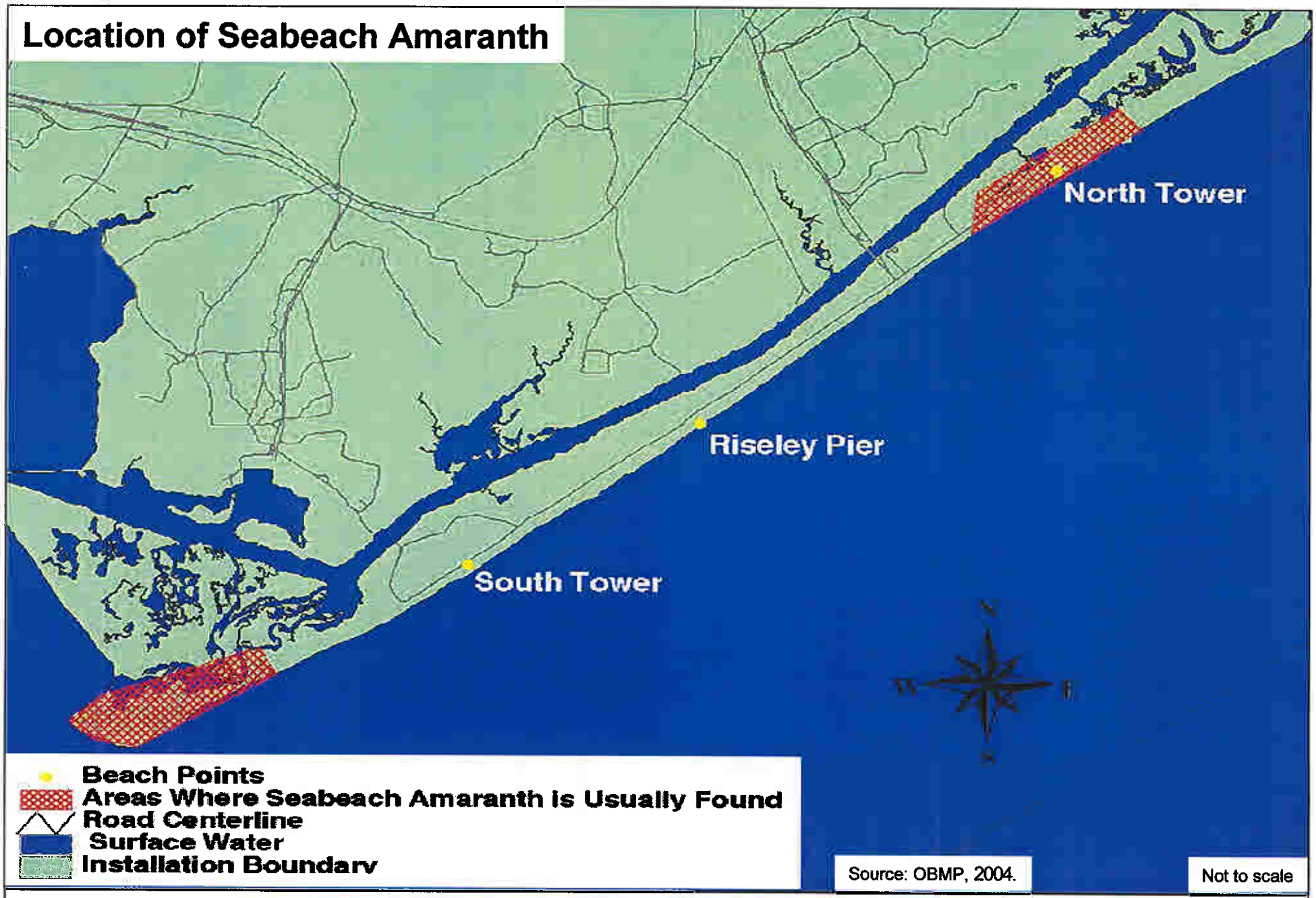

FIGURE 3-2

Onslow Beach EA

management areas have been designated on the Base. This species is listed as threatened due to similarity of appearance with the American crocodile, a listed endangered species.

Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*) is listed as threatened under the ESA. It is the most abundant sea turtle in U.S. waters. Nesting areas in southern Florida are the second largest in the world and are of major importance to the species.

Like all cheloniids, the hatchlings drift in convergence zones in floating patches of *Sargassum* (NMFS and USFWS 1991a). As juveniles, they begin occupying the waters of the continental shelf, edge and slope from 656 ft (200 m) deep all the way into coastal waters and estuaries. These waters comprise an important developmental habitat for this species (Epperly et. al. 1995). Juveniles and adults feed mostly on benthic invertebrates. Loggerheads are the most commonly sighted sea turtles in North Carolina. Ten times as many loggerheads are sighted off the North Carolina Coast than are greens, the second most abundant turtle in the region (DON 2002a). In 2002, loggerheads accounted for 71 percent of all turtles incidentally taken in fisheries off North Carolina and 14 of the 25 sea turtles stranded there in 2002 (U.S. Army Corps of Engineers [USACE] 2003). In Pamlico and Core sounds, loggerheads comprised 80 percent of the incidental catch, greens 15 percent, and Kemp's Ridleys, 5 percent (Epperly et. al. 1995).

Loggerhead nests are by far the most abundant in North Carolina, comprising some 90 percent of the nests (DON 2002a-c; 2003; USACE 2003; Coastal Planning and Engineering of North Carolina, Inc. [CPENCI] 2003). At Camp Lejeune, the average density of nests on Onslow Beach is 5.6 per mile. The nesting frequency drops off between Riseley Pier and the Onslow Beach Bridge because these areas are lighted at night (USFWS 2002). Most nesting occurs at the northeast end of Onslow Beach (DON 2002a).

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) is listed as threatened under the ESA. The Florida and Mexico nesting populations are considered endangered. Since green sea turtles found along the western North Atlantic coast cannot be readily characterized as to which nesting population they came from, all western North Atlantic green sea turtles are considered endangered (DON 2002a and c; NOAA Fisheries 2002).

Although greens can be found year-round in North Carolina, they are most abundant from spring through fall. They have been reported in nearshore, shelf and edge waters, generally in less than 164 ft (50 m) of depth (DON 2002a-c; 2003). Although green sea turtles occasionally nest on Onslow Beach, these nests comprise only a very small portion of the nests made by loggerheads (DON 2002a-c; 2003). At Bogue Inlet, immediately to the north of Camp Lejeune, only 2 green sea turtle nests were discovered in 2000 versus 32 loggerhead nests. In 2001, 30 loggerhead nests were reported, followed by 35 in 2002. No green sea turtle nests were reported during the same years (USACE 2003). By catch and stranding data for the same area indicate similar relative abundance (see previous species account). The occurrence of this species at the project site is expected, but in low numbers.

Leatherback Sea Turtles

The leatherback sea turtle (*Dermochelys coriace*) is a federally listed endangered species. No leatherback nests have been reported at Camp Lejeune (DON 2002a and c). The occurrence of this species at the project site is expected, but in low numbers.

3.8.4.2 State Listed Species

The Endangered Species Act (ESA) of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants, and the habitats in which they are found. The ESA prohibits jeopardizing endangered and threatened species or adversely modifying critical habitats essential to their survival without specific authorization from the National Marine Fisheries Service (NMFS) or US Fish and Wildlife Service (USFWS). Section 7 of the Act requires consultation with NMFS or the USFWS to determine when any endangered or threatened species under their jurisdiction may be affected by a proposed action. The Marine Corps ensures that consultations are conducted as required with the USFWS and NMFS under Section 7 for any action which "may affect" a threatened or endangered species according to guidance provided in the *Environmental Compliance and Protection Manual* (MCO P5090.2A).

The state of North Carolina Natural Heritage Program (NCNHP) similarly lists plant and animal species considered to rare, threatened, and endangered within the state. North Carolina Administrative Code S.113.337 makes it unlawful to take, possess, transport sell, barter, trade, exchange, export, or offer for sale, any animal on a protected wild animal list. It does not restrict the rights of a landholder in the management of his lands for agriculture, forestry, development, or any other lawful purpose without his consent.

While the state statute does not bind MCB Camp Lejeune, the staff typically evaluates the presence or absence of state-listed species when assessing the impacts of projects on the Base. The state list includes all those species federally listed as threatened and endangered, plus additional species that may not be rare, threatened, or endangered from a nationwide perspective, but are so within the boundaries of the state.

3.8.5 Essential Fish Habitat (EFH)

Essential fish habitat is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NOAA Fisheries 2002). Essential fish habitat for managed fishery resources is designated in the Fishery Management Plans prepared by regional Fishery Management Councils under the Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801). Fishery Management Councils may also designate Habitat Areas of Particular Concern, which are "subsets of essential fish habitat which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area" (NOAA Fisheries 2002). The Management Councils under the Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with NOAA Fisheries when any activity proposed to be funded, permitted, or carried out may have an adverse effect on essential fish habitat.

Fishery resources within the project area for which Fishery Management Plans have been prepared by the South Atlantic and Mid-Atlantic Fishery Management Councils include the following:

- Shrimp
- Red Drum
- Snapper/Grouper
- Coastal Migratory Pelagics
- Coral and Coral Reef
- Calico Scallop
- Summer Flounder, Scup, Black Sea Bass
- Bluefish
- Dogfish

Essential fish habitats that occur within the project area include the following:

- **Estuarine Emergent Wetlands**. These include salt marsh habitats along the shores of the AIWW and New River Inlet.
- **Submerged Aquatic Vegetation**. Submerged Aquatic Vegetation occurs patchily within the AIWW and New River Inlet.
- **Intertidal Flats**. These include mudflats along the shores of the AIWW and New River Inlet.
- **Palustrine Emergent and Forested Wetlands.** These are freshwater habitats that occur in the creeks that flow into the AIWW and New River Inlet.
- **Estuarine Water Column**. This includes the open water areas of the AIWW and New River Inlet.
- **Live/Hard Bottom Habitat.** As described above, considerable areas of live/hard bottom are scattered in Onslow Bay (DON 2002a, 2003).
- **Coral and Coral Reefs**. As described above, patches of coral occur in Onslow Bay (DON 2002a, 2003).
- **Artificial and Manmade Reefs**. Several artificial reefs occur in Onslow Bay (DON 2002a, 2003).
- **Sargassum Habitat.** The presence of this habitat within the project area is transient and dependent on surface currents that bring occasional mats of *Sargassum* inshore from the floating beds that circulate in Gulf Stream.
- **Marine Water Column**. Many managed species occur within specific portions of the oceanic water column (between the surface and the bottom) and are dependent on this habitat for development, dispersal, or feeding.

For additional information on the distribution and importance of these habitats in the region see DON (2002a, 2003), NOAA Fisheries (2003), and Okey and Pugliese (2001).

3.9 Water Resources

3.9.1 Water Quality

Most of Camp Lejeune drains into the New River, and some drains into the Cape Fear Water Basin, the AIWW and the Atlantic Ocean. Specifically Onslow Beach drains into the AIWW, Onslow Bay (the Atlantic Ocean), the New River Inlet, and Brown's Inlet. Water quality data are summarized in 5-year basin-wide assessment reports prepared by the North Carolina Department of Environmental and Natural Resources (NCDENR) (NCDENR1999, 2000). Camp Lejeune also contains numerous ponds and drainage ditches.

The state of North Carolina has assigned water quality classifications for all surface waters in the state based on the existing and contemplated "best usage" for which the waters must be protected. The AIWW and Onslow Bay are both classified as SA waters. Class SA waters are suitable for shell fishing and any of the uses specified for "SB" and "SC" classifications. Class SB waters are suitable for primary recreation and other uses as specified by the "SC" classification. Class SC waters are suitable for aquatic life propagation and survival, fishing, wildlife, and secondary recreation.

3.9.2 Wetlands

Executive Order 11990 directs federal agencies to avoid adverse impacts on wetlands to the extent practicable. Wetlands occur throughout Camp Lejeune due to the low relief, the poorly drained soils, and the proximity of the New River and AIWW. Out of 143,509 acres (58,101 hectares), within the boundaries of Camp Lejeune, it is estimated that there are 48,764 acres (19,743 hectares) of wetlands, plus an additional 17,878 acres (7,238 hectares) of open water habitats (MCB Camp Lejeune 2001). As required by the CEQ's regulations implementing NEPA (40 CFR Part 1500), this section describes the area(s) that would be affected by the Proposed Action. Wetlands within the Onslow Beach area encompass approximately 38 acres with approximately 2 acres within the proposed tank trail area (see Figure 3-3 *Wetlands at Onslow Beach*). The impacts of the proposed action are addressed in Chapter 4 of this PEA.

3.9.3 Floodplains

Executive Order 11988 sets forth the responsibilities of federal agencies in reducing the risk of flood loss or damage to personal property, minimizing the impacts of flood loss, and restoring the natural and beneficial functions of floodplains. This order was issued in furtherance of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Floodplains and flood hazard zones in Onslow County have been mapped by the Federal Emergency Management Agency (FEMA) and other agencies as part of the North Carolina Floodplain Mapping Program. Areas of Camp Lejeune that are within the 100-year floodplain include the margins and tributaries of the New River and AIWW (North Carolina Floodplain Mapping Program 2004). Nearly all of Onslow Beach is within the 100-yr floodplain.

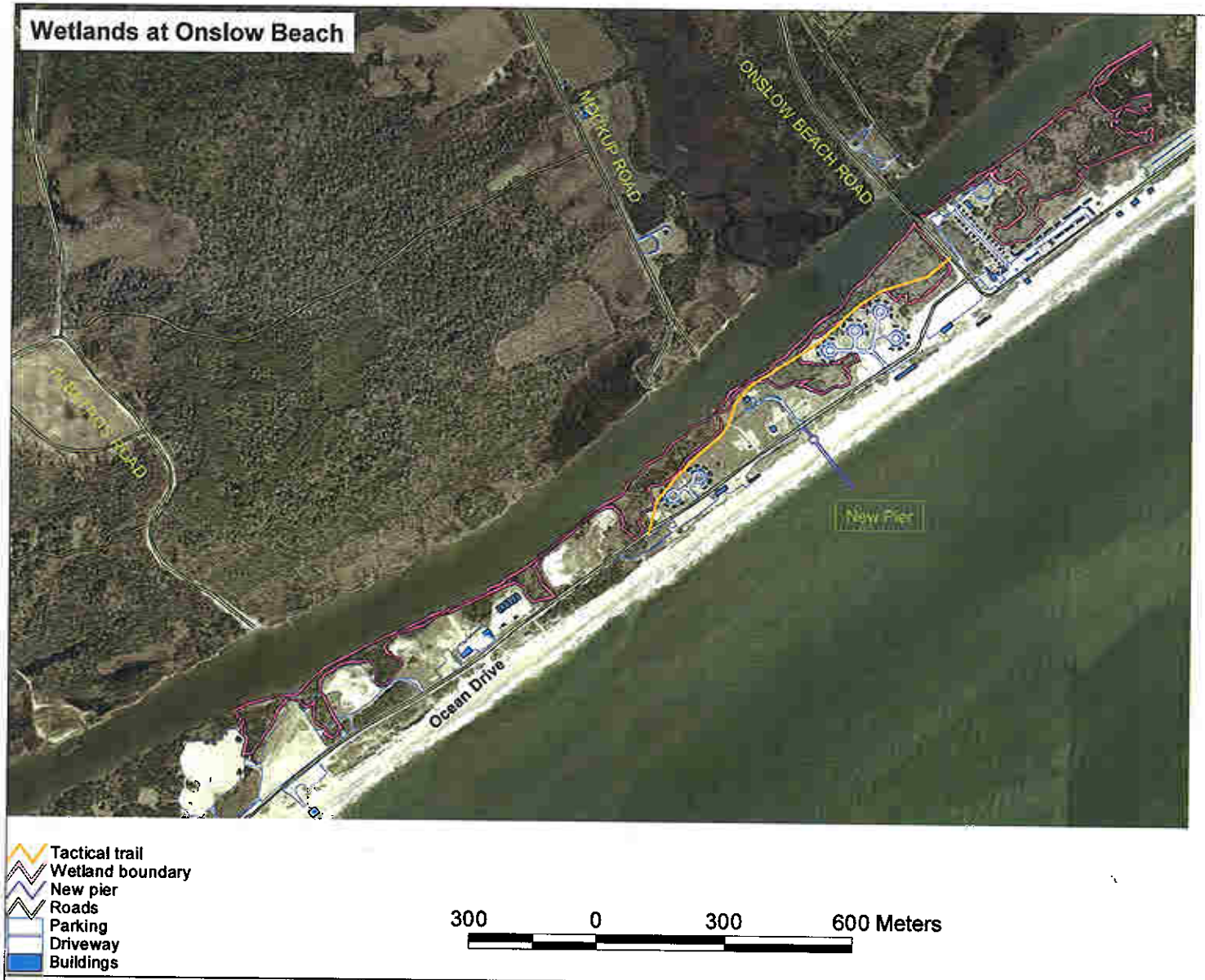

FIGURE 3-3

Onslow Beach EA

3.10 Safety

The intermingling of recreation and military training makes safety a top priority at Onslow Beach. Training areas are marked with appropriate signs and separated from the main recreation areas. Standard operating procedures for training are followed to assure safety of both Marines and the non-participating beachgoers.

There is one main access road (Onslow Beach Road) to Onslow Beach that crosses the AIWW along a single drawbridge. Ocean Boulevard runs the length of the Onslow Beach and is used by both Marine amphibious vehicles and recreational traffic. This situation has resulted in several potentially dangerous interactions between recreational users and tactical vehicles.

3.11 Aesthetics

Development at Onslow Beach is consistent with a low impact beach community. All buildings at the site are under two stories. The developed part of the beach is primarily restricted to the current recreational areas. Much of the rest of the island is in its natural state with sand dunes and low growth scrub-shrub.

4 ENVIRONMENTAL CONSEQUENCES

This chapter describes the anticipated direct, indirect, and cumulative impacts of the alternatives. The remainder of this chapter briefly describes criteria used to judge the severity and scope of effects to specific resources, and then identifies the potential impacts due to implementing the No-Action Alternative and the Proposed Action.

4.1 Land Use and Coastal Management

4.1.1 Land Use

4.1.1.1 Proposed Action

Implementation of the Proposed Action would modify current land use designations in order to deconflict recreational, training, and conservation uses of Onslow Beach (see Figure 2-2 *Proposed Land Use Designations*). The only designation change would actually be a few hundred yards of land between the SOTG compound and the current Riseley Pier. This area is currently dual-use as both recreation and training, but would be used only for training in the future. The current Riseley Pier, which is an attraction to beach patrons and fishermen, would be relocated to the northeast, central to the proposed recreation area. This, combined with a limited access gate/fence, would segregate the recreation and training land use completely in this area. Overall the OBMP proposes a clearer designation of land use than what is currently in place, and this should have a positive effect on the human environment at Onslow Beach.

Proposed land use designations would be strictly observed when locating proposed recreational facilities, utility upgrades, and conservation measures in the future.

4.1.1.2 No-Action Alternative

The No-Action Alternative, to not implement the OBMP, would result in conflicts between the recreational and training uses, especially of the section of beach between the SOTG compound and the current Riseley Pier. Beach patrons and fishermen would continue to be attracted to the pier area, even during training exercises where there presence may interfere with the ongoing military operations. Clear land use designations would not be implemented and multiple users and commands at MCB Camp Lejeune would not have defined areas for specific types of development. This could lead to more conflicts in the future.

4.1.2 Coastal Zone Management

Demands placed on lands and waters of the coastal zone from existing economic development and population growth require that new projects or actions be carefully planned in order to avoid stress on the coastal zone. This planning involves a review of state and local enforceable policies, which are designed to provide effective protection and use of land and water resources of the coastal zone. Enforceable policies and consistency are discussed in this subchapter.

Eleven general policy guidlines issued by North Carolina for the coastal area are listed in Chapter 3.1.2. Of these eleven, two policies are applicable to the proposed facility construction and training. Consistency with these two applicable policies is addressed in the following paragraphs.

- Mitigation Policy – Implementation of mitigation measures to minimize potential environmental impacts would be consistent with North Carolina's policy that requires mitigation for adverse impacts to coastal lands. Impacts to natural resources would be mitigated as necessary.
- Coastal Water Quality Policies – The design and implementation of the proposed Onslow Beach Master Plan is not expected to impair coastal water quality. Implementation of the proposed action would be consistent with coastal water quality policies.

Areas of environmental concern are afforded protection because they are areas of statewide concern within the coastal area. The following paragraphs address the applicability of policies designed to protect areas of environmental concern and consistency with those policies when applicable.

- Estuarine and Ocean Systems – Onslow Beach is adjacent to estuarine and ocean systems.
- Ocean Hazard Areas – Policies on ocean hazards are applicable.
- Public Water Supplies – The construction of proposed facilities would avoid areas where there are small surface water supply watersheds or public water supply well fields. Therefore, policies protecting public water supplies are not applicable.
- Natural and Cultural Resource Areas – Onslow Beach is a fragile coastal natural resource but contains no cultural resources.

Onslow County's coastal zone management policies, which have been approved by the NC Coastal Resources Commission, are listed in Table 4.1-1, along with their applicability to proposed facility construction.

Impacts to the coastal zone from implementation of the Onslow Beach Master Plan would be minor. The Marine Corps Base is submitting the OBMP to the North Carolina Division of Coastal Management for concurrence that implementing the plan would be consistent with

the applicable policies of the North Carolina Coastal Management Program and Onslow County's Coastal Zone Management Policies.

Resource Protection Policies	Applicability
Soils: • Septic tank use • Wetlands protection	 Not Applicable Consistent
Flood Hazard Area: • Coordinate development in floodplains with NCDCM, FEMA, USACE	Consistent
Groundwater/Protection of Potable Water Supplies: • Support stormwater runoff regulations • Coordinate activities involving USTs installed/abandoned • Coordinate ground water protection with adjacent counties	 Consistent Not Applicable Not Applicable
Manmade Hazards: • Coordinate UST regulations with state • Expansion of Albert Ellis Airport per Master Plan • No bulk storage of hazardous materials in urban areas • No toxic waste dump sites in county or on military property • No disposal of toxic wastes in county	Not Applicable
Stormwater Runoff: • Support state stormwater runoff regulations • Support control of agricultural runoff • Support control of forestry runoff • Design projects to limit possible stormwater runoff to estuarine waters	 Consistent Not Applicable Not Applicable Consistent
Cultural/Historic Resources: • Protect significant architectural/archaeological/cultural resources	 Consistent
Industrial Impacts on Fragile Areas	Not Applicable
Package Treatment Plant Use	Not Applicable
Marina and Floating Home Development	Not Applicable
Mooring Fields	Not Applicable
Off-Road Vehicles – No restrictions	Not Applicable
Development of Sound and Estuarine Islands	Not Applicable
Bulkhead Construction	Not Applicable
Sea Level Rise	Not Applicable
Maritime Forests: • Encourage acquisition of high quality tracts for conservation • Development of residential nature	Not Applicable
Estuarine System – develop water dependent uses along Estuarine Shoreline AEC	Not Applicable
Protection of Outstanding Water Resources at Stump Sound and Bear Island	Not Applicable
Water Quality Management in White Oak and Cape Fear Basins	Not Applicable
Resource Production Policies	**Applicability**
Community Attitude Toward Resource Management and Production	Not Applicable
Recreation Resources: • Support access to waterfront/shoreline • Apply for grant funds • Priority to repairing/replacing damaged/destroyed shoreline access facilities • Support year-round recreation program • Prepare county-wide comprehensive recreation plan • Allow golf courses if meet buffer requirements and other regulations	 Not Applicable
Peat or Phosphate Mining	Not Applicable

Economic and Community Development Policies	Applicability
Water Supply: • Support extension of central water service to areas not classed as rural • Support enforcement of potable water supplies • Support grant funding to construct/expand public/private water systems • Support construction of adequately sized water systems	Not Applicable
Sewer System: • Provide water systems to county residents and study expansion • Secure grant funding • Support "created" wetlands for treating waste effluent	Not Applicable
Solid Waste: • Support operations of new county landfill • Support education on recycling and waste reduction • Support siting of recycling centers in all areas except conservation • Support clean community projects	Not Applicable Consistent Not Applicable Not Applicable
Energy Facility Siting and Development: • Review any applications for electric-generating plants • Support preparation of an EIS for new energy-related facilities	Not Applicable
Community Facilities	Consistent
Redevelopment of Developed Areas	Consistent
Land Use Regulation/Urban Growth Patterns: • Encourage urban development near existing urban areas • Permit residential development to meet market needs • Enforce existing regulations	Not Applicable
Estuarine Access	Consistent
Types and Locations of Desired Industry	Not Applicable
Commitment to State and Federal Programs	Consistent
Assistance to Channel Maintenance	Not Applicable
Assistance in Interstate Waterways	Not Applicable
Transportation: • Identifies specific roadway improvements • Identifies specific improvements to Albert Ellis Airport	Not Applicable
Land Use Trends: • Development of "404" wetlands • Expansion of central water and sewer areas • Increasing traffic on US 17 and NC24 • Continued support of economic and industrial development • Development of an industrial park • Establishment of county wide zoning • Development of a new solid waste disposal facility • Support the US MCAS New River and Albert Ellis Airport • Intergovernmental cooperation • Expansion of county-wide recreational opportunities • Reduction of the county's substandard dwelling units • Low elevation and sea level rise • Regulation of nonpoint sources of water pollution • Control of development in fragile areas • Regulation of corporate farms and increased agricultural runoff	Consistent Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Consistent Not Applicable
Continuing Public Participation Policies	Consistent
Storm Hazard Mitigation	Not Applicable

Onslow County, and subsequently MCB Camp Lejeune are within the coastal zone, although, lands owned by the Federal government are excluded from the defined coastal zone. Impacts to the coastal zone are judged based on the potential to affect the state approved coastal zone policies. In North Carolina, the CAMA is the state approved CZMA policy dealing with resource protection and management, economic and community development, continuing public participation, storm hazard mitigation, post-disaster recovery, and evacuation plans. Under the federal coastal consistency determination requirements, the Base complies with the applicable policies of CAMA to the maximum extent practicable.

The only areas off-base that could be potentially affected by the Proposed Action are the state-owned waterways such as the AIWW, the New River, and Onslow Bay. Only Proposed Actions that affect areas off-base are considered as potential impacts to the coastal zone. Required setbacks for structures would also be observed to minimize the potential for major storms to destroy them and carry them away (Ocean Hazard AEC, 15A NCAC 7H.0306; see also OBMP Appendix A).

4.1.2.1 Proposed Action

Construction of a new pier, hardening amphibious vehicle splash points, and improving the current boat landing would all take place in the waters of North Carolina. The proposoed 900 ft pier would be in Onslow Bay (Atlantic Ocean). Potential impacts would be from the pilings driven into the ocean floor. The splash points and boat ramp are located on the AIWW. Concrete and riprap would be used to create ramps sloping from land into the AIWW. Additionally, the boat landings would include small docks allowing boaters to better handle and load/unload their boats. Some minor erosion and sedimentation may result from the construction of these facilities. Bottom habitat could also be harmed if submerged aquatic vegetation or unique fish habitat exists in these areas. Hardening the splash points would, however, correct the long-term erosion problem that currently exists in these areas. The possible construction of an observation deck behind the dune line in the vicinity of Riseley Pier would cause some minor short term impacts. All proposed recreational structures would be set back the required distance from the first line of stable vegetation in accordance with CAMA.

Based on an evaluation of potential impacts resulting from the implementation of the OBMP, only minor impacts to North Carolina's coastal zone or CAMA are expected. Therefore, the policies and plans outlined in the OBMP are, to the maximum extent practicable, consistent with the enforceable policies of North Carolina's CAMA.

The OBMP is being submitted to DCM for consistency determination concurrence. MCB Camp Lejeune staff would also conduct a coastal zone consistency determination when design plans are available for each of the proposed construction projects.

4.1.2.2 No-Action Alternative

The No-Action Alternative, not to implement the OBMP, would result in no significant impacts the coastal zone of North Carolina. Minor water quality impacts would continue

due to erosion at the splash points. MCB Camp Lejeune staff would conduct a environmental review of proposed actions via the Environmental Impact Working Group. Consistency determination concurrences would be obtained for construction projects, as appropriate.

4.1.3 Coastal Barrier Resources Act

The current recreational area along Ocean Drive both southwest and northeast of the intersection with Onslow Beach Road is the only area of Onslow Beach that is not in the Coastal Barrier Resources System (CBRS). No federal expenditures that encourage development are allowed in the rest of Onslow Beach with the exception of funds spent for habitat management or enhancement or for military activities essential to national security.

4.1.2.3 Proposed Action

There are components of the proposed action that have no potential to affect the CBRS. These components either have no construction component or take place completely outside the CBRS. These components are designating land use, improving the boat landing, and constructing a new pier.

The fence/gate would be constructed within the southwest boundary between the CBRS and non-CBRS areas. This would partially fulfill a need to control access to conservation areas. Therefore, federal expenditures would be allowed under the exception in Section 6(a)(6)(A) for the management of wildlife habitat. The tactical trail would have a small section within the CBRS near the proposed gate. The splash points that would be hardened are also in the CBRS. These projects would both improve the erosion problems realized under current conditions. Therefore federal expenditures would be allowed under Section 6(a)(6)(G) for nonstructural projects that improve natural shoreline stabilization.

Riseley Pier is located within the CBRS. Converting the pier into an observation deck would greatly reduce the current footprint, but would require the expenditure of federal funds to partially demolish and remodel. Nevertheless, the funds would not be spent to encourage development. This step would remove a structure and partially eliminate the draw for the recreational activities to move into this area. Therefore, federal expenditures would be allowed in this area for this project component.

Most of the new facilities associated with improvements to the recreational area are sited outside of the CBRS. According to the mapping however, a small portion of the facilities at each end of the recreational area spill into the CBRS by a few hundred meters. To the northeast about 13 Officer/SNCO lodges and the Officer/SNCO pavilion are within the CBRS. To the southwest, four to five enlisted lodges are located within the CBRS. These units are in previously developed areas.. The possible construction of the observation deck behind the dunes in the vicinity of Riseley Pier is considered a relocation of an existing functional use. Therefore, federal funds are not being used to encourage development.

Overall, proposals to spend federal money within the CBRS either would not encourage new development or would enhance wildlife management in the defined areas.

4.1.2.4 No-Action Alternative

The No-Action Alternative, to not implement the OBMP, would result in no expenditures of federal funds to encourage development in the CBRS at Onslow Beach.

4.2 Recreation

4.2.1 Proposed Action

Recreation is a key component at Onslow Beach. The OBMP outlines many proposed improvements to the recreational opportunities offered at Onslow Beach, but also places further limitations on access to certain areas. Improvements include upgrades to current facilities; increasing the lodging/RV capacity; constructing new community and fishing areas; and providing more services such as a bar and grill restaurant and family game areas (horseshoes, basketball, shuffleboard, etc.).

Placing limitations on recreational opportunities could be viewed as an impact, but it is important to frame this discussion in the context of Onslow Beach being first-and-foremost a military training asset. The proposed land use designation would remove a few hundred yards of beach from the recreational designation between the SOTG compound and Riseley Pier and designate this area for training only. This would still allow beach patrons several thousand yards of beach to use, between the SOTG compound and the Officer's Pavilion near the Onslow North Tower. The fence/gate would be built adjacent to the SOTG compound and would enforce the proposed land use designation by not allowing unauthorized personnel to the southwestern training beach. Therefore, impacts to recreation would be minor due to this proposed project component.

The Base Order 11017.1F restricts ORRV use in the current ORRV area between Riseley Pier and the New River Inlet. From the Riseley Pier to the South Tower restrictions include ORRV use during daylight hours from April 1 to October 31 and day and night ORRV use during November 1 to March 31. ORRV restriction between the South Tower to the New River Inlet, which is prime sea turtle nesting and shorebird habitat, include no ORRV use during April 1 to August 31. From September 1 though October 31 daylight use is only allowed and from November 1 to March 31 day and nighttime ORRV use is allowed if no training is scheduled. MCB Camp Lejeune views driving ORRVs in this area at certain times of year as a liability to the conservation of threatened and endangered species. The BO 11017.1F ORRV restriction is not considered a significant impact to recreation.

The construction of the tactical trail would deconflict Ocean Drive and Onslow Beach Road between the SOTG compound and the AIWW Bridge. This trail would allow tactical vehicles to travel on a separate roadway than the recreational traffic. Pedestrian overpasses built in conjunction with this tactical vehicle trail would allow fishermen and others access to the AIWW shoreline and the current fishing docks. This situation would cause less administrative pauses in the military exercises (less conflicts between tactical vehicles and beach patrons), and therefore increase training realism. It would also significantly increase

public safety in the recreation area. This proposed project component would have a positive effect on recreation.

4.2.2 No-Action Alternative

The No-Action Alternative, to not implement the OBMP, would have some impacts on recreation. Recreation would continue at Onslow Beach at the present rate, with demand greatly exceeding supply in the summertime. This would mean some beach patrons would not be able to secure lodging. Other recreational opportunities desired by beach patrons would not be available. Conflicts between recreational users and military training would continue to pose problems in the area around Riseley Pier, down to the AIWW Bridge. Overall, the No-Action Alternative would not meet the recreational purpose of the OBMP, and in fact would have some minor impacts.

4.3 Environmental Justice and Impacts on Children

This section evaluates Environmental Justice impacts based on Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* for the No-Action Alternative and the Preferred Alternative.

Neither the Proposed Action nor the No-Action Alternative would affect minority or low-income populations or otherwise discriminate against any minority or low-income people. Additionally, no children would be adversely affected by implementing the Proposed Action. Proposed recreational facilities would be open to all retired and active military, authorized civilians, and their families without regard to race, origin, income level, or any other factor.

4.4 Infrastructure

4.4.1 Traffic On-Base

Impacts to traffic include potential traffic-volume increases and their effects on roadway and intersection capacities. Only on-base areas within the immediate vicinity of the proposed sites are considered for traffic impacts.

4.4.1.1 Proposed Action

Some of the project components such as designating land use; hardening boat splash points and improving the boat landing; promoting outdoor recreation; and implementing additional conservation practices would have no potential to affect the traffic at Onslow Beach.

The construction of the fence/gate and the tactical trail will help to deconflict military tactical vehicle and beachgoer vehicles especially on Onslow Beach Road and Ocean Drive between the AIWW Bridge and recreation areas to the southwest. The fence/gate would restrict recreational users from traveling into the training area. The tactical trail would allow

for the separation of tactical-military and privately owned vehicles. This would increase traffic flow in the area, and promote overall traffic safety.

Part of the project component to upgrade the recreational facilities would include realigning the road and separating the lanes of traffic near the intersection of Onslow Beach Road and Ocean Drive. Not only would this provide the space for planned recreational facilities, but also the separation of traffic should improve flow on and off the beach in the busy summer months.

The construction of the proposed recreational facilities, including the pier, could cause increased road traffic in the immediate vicinity of the projects due to delivery of construction materials. The realignment of the roads near the intersection of Onslow Beach Road and Ocean Drive could also cause minor delays during construction. This impact would be short term, lasting only for the duration of the construction activities, and the construction activities would be spread out in space and time. Construction efforts would be coordinated to avoid significant traffic congestion during busy times. Therefore, no significant impacts to traffic are expected from construction activities associated with building and improving recreational facilities.

4.4.1.2 No-Action Alternative

Existing roadway networks and traffic conditions at MCB Camp Lejeune would be unaffected by the No-Action Alternative. The bottleneck between the AIWW Bridge and the recreation area to the southwest would continue. Tactical military vehicles and privately owned vehicles would continue to be at odds in this congested area. This would continue to be a traffic safety issue.

4.4.2 Utilities

Impacts to utilities occur when demands are placed on a system beyond its designed capacity. This could in turn affect the capacity of utility system, or the ability to deliver service to its customers.

4.4.2.1 Proposed Action

Many of the project components outlined in the OBMP and this PEA would have negligible effects on the utility systems currently in place at Onslow Beach. Designating land use; constructing a fence/gate and tactical trail; hardening splash points and improving the boat landing; relocating the pier and turning the current pier into an observation platform or building a new observation deck; promoting outdoor recreation; and implementing additional conservation practices have no or negligible utility demands beyond what is already supplied to the beach area.

With the improvements to the community areas, upgrading the recreational facilities, and an increase in the lodging units, the demands on utilities will increase. However, the current infrastructure can adequately support the existing and proposed development. Utilities

would be maintained and upgraded as needed. Therefore no significant impacts to utilities are anticipated.

4.4.2.2 No-Action Alternative

Under the No-Action Alternative, not to implement the OBMP, the current utility systems at Onslow Beach would be adequate for the present level of activity. No additional impacts would occur.

4.4.3 Navigation

Navigation considered in this PEA is the movement of recreational and commercial boating/shipping traffic along the AIWW and Onslow Bay (coastal Atlantic Ocean). Impacts to navigation would include increasing the closures of public waters due to Marines training. MCB Camp Lejeune is sensitive to the competing uses of public waterways, and carefully analyzes its impacts to the access of this resource. Procedures for closing sectors of the New River, AIWW, and Onslow Bay are outlined in Section 3.12 as per 33 CFR Part 334.440 (Danger Zone and Restricted Area Regulations). Impacts could also occur as a result of placing structures in navigable waters that could potentially interfere with boat traffic.

4.4.3.1 Proposed Action

Most of the components of implementing the OBMP would have no potential to affect the navigation of vessel traffic in the New River, AIWW, or Onslow Bay. Designating land use; constructing a fence/gate and tactical trail; improving facilities in the recreational area; promoting outdoor recreation; and implementing additional conservation practices would have no potential to affect navigable waterways.

Amphibious exercises would continue at Onslow Beach, as would live fire exercises in the N-1/BT-3 Impact Area. This necessitates the closure of sectors of the AIWW and Onslow Bay to non-participatory craft during these periods as outlined by 33 CFR Part 334.440 (Danger Zone and Restricted Area Regulations). No new actions that would require closures are part of the Proposed Action or the projects associated with the OBMP.

The construction of a new pier, the hardening of splash points, and the improvement to the boat landing will require permits from USACE issued under Section 10 of the Rivers and Harbors Act (RHA) to build structures in navigable waters of the U.S. The splash points and the boat landing will basically be concrete ramps extending into the water a few feet. The boat landing could additionally have a small dock associated with it for loading/unloading boats. This would be limited to within a few feet of shore and would not limit navigation in the AIWW in any way. The new pier could extend into Onslow Bay up to 900 ft. This is in the Atlantic Ocean, extending from the shore, and therefore the pier could easily and safely be navigated around by near-shore craft. All other navigation in Onslow Bay would be completely unaffected. No impacts to navigation would be anticipated due to the new pier, splash points, or boat landings, and MCB Camp Lejeune

would obtain all RHA Section 10 permits from the USACE when final design plans are completed.

4.4.3.2 No-Action Alternative

The No-Action Alternative, to not implement the OBMP would not have any additional impacts to navigation. Camp Lejeune would continue to temporarily close sectors of the New River, AIWW, and Onslow Bay when conducting military training in these areas according to 33 CFR Part 334.440.

4.5 Air Quality

Emission thresholds associated with federal CAA conformity requirements are the primary means of assessing the significance of air quality impacts. Potential impacts are evaluated based on estimated direct and indirect emissions associated with the Proposed Action.

The Clean Air Act of 1970, 42 USC 7401 *et seq.* (amended 1977 and 1990), requires that the EPA promulgate rules to ensure that federal actions conform to the appropriate State Implementation Plan. These rules are only applicable to nonattainment areas, and are therefore not relevant to this proposed project since Onslow County is in attainment for all criteria pollutants.

4.5.1 Proposed Action

Most of the projects that are part of the Proposed Action would have no potential to affect air quality. The upgrading of recreational facilities and utility lines could cause minor impacts to air quality through emissions and fugitive dust from construction equipment. However, these emissions would be very short term and minor. Fugitive dust control would be implemented as part of the construction plan. Construction would cause negligible impacts to air quality from vehicle emissions and fugitive dust.

4.5.2 No-Action Alternative

The No-Action Alternative, not to implement the OBMP would result in no additional impacts to air quality at MCB Camp Lejeune.

4.6 Noise

The primary factor considered in determining the significance of potential noise impacts is the extent or degree to which the Proposed Action would affect the baseline noise environment. The primary issue of concern with regard to noise is the potential for impacts to the human environment and land use classifications. Therefore, predicted changes in land use compatibility zones and percent of population highly annoyed due to the Proposed Action are appropriate measures of impact.

4.6.1 Proposed Action

The designation of land use, promotion of outdoor recreation, and the implementation of additional conservation measures would have no potential to generate additional noise. Further restrictions on ORRVs would reduce the noise levels in the southwest area of the beach. None of the activities that are part of the OBMP would generate any significant amount of noise over existing levels while in operation.

Demolition and construction activities associated with many of the projects outlined in the OBMP would create additional noise at these localized sites for a short duration. Delivery trucks would travel along public roadways to get on-base, but would be spread out in time and space. This would not generate noise above current levels considering the heavy volume of traffic already existing around Camp Lejeune. The closest off-base area is located several miles from the construction activities; the noise would not be perceivable at this distance. Additionally the construction noise would be masked by noise generated from other military training activities. Noise impacts would be minor and of short duration, lasting only for a couple of months at any one location during construction activities.

The tactical trail would be constructed directly behind (on the AIWW side of) the recreation area and the enlisted lodges. Large tactical vehicles involved with amphibious exercises would use this trail and are noisy. The training would be announced for several days prior to the event and would typically happen during the day when beach patrons are active and less sensitive to noise than at night. Overall, only minor noise impacts would occur to military personnel and their families due to implementing the Proposed Action.

4.6.2 No-Action Alternative

The decision not to implement the OBMP, the No-Action Alternative, would cause no additional noise impacts. Significant noise would continue to be generated around the Base due to current military training activities (small arms, artillery, aircraft, and ground vehicles). This noise attenuates over the distance between the training areas and the off-base receivers, and as a result, only minor noise impacts occur beyond MCB Camp Lejeune's boundaries.

4.7 Cultural Resources

Only one archaeological site, 31ON1246, has been found at Onslow Beach, and it is in an area with no planned development. Archaeological evaluation and mitigation excavation was conducted on this site as a result of past storm related erosion in 2004 and 2005. Further erosion due to Hurricane Ophelia in September 2005 further eroded the known remaining area of the site. Consultation with NC SHPO was conducted by letter of November 22, 2005, and NC SHPO concurred by letter of December 19, 2005 that no historic properties on or eligible for listing on the National Register of Historic Places would be affected by proposed implementation of the Onslow Beach Master Plan. See Appendix C.

If any artifacts or other cultural resources were encountered during construction, work would cease and the Environmental Management Division at MCB Camp Lejeune would be contacted to investigate and identify additional archaeological survey requirements and mitigation measures that might be needed. Investigations would be carried out in accordance with Camp Lejeune's ICRMP, which addresses NHPA compliance and provides guidance on management of historic properties. Operators are also required to follow Base Order 11000.19A which provides for protection against unauthorized excavation, removal, alteration or defacement of archaeological resources.

Only one archeological site has been found at Onslow Beach, and it is in an area with no planned development. This site is near the southwest end of the beach and is zoned for training and conservation, and therefore control of the site is easily accomplished. Operations or exercises on or around marked/signed sites require coordination with the Base Archaeologist and tracked vehicles are restricted to existing trails.

Neither the Proposed Action nor the No-Action Alternative would have effects on any cultural resources.

4.8 Natural Resources

4.8.1 Geology, Topography, and Soils

The minimization of soil erosion is considered when evaluating the potential impacts of the Proposed Action. Generally, soil impacts can be avoided or minimized if proper construction techniques and erosion control measures are incorporated into project design.

Overall, the potential to erode the soils at Onslow Beach due to rain and stormwater runoff is low due to the sandy soil's high permeability. The real erosion potential is at the shoreline where wind and wave action constantly sculpt the barrier islands. Large storms and especially hurricanes pose the greatest threat to Onslow Beach and the other barrier islands (Cleary & Riggs 1999).

4.8.1.1 Proposed Action

Impacts to geology, topography and soils would have no potential to occur as a result of designating land use or promoting outdoor recreation.

Impacts to soils and topography due to the construction of new facilities would be minor and temporary. The holes dug for the fence posts and pilings to support proposed facilities such as the fence/gate, landside of the proposed pier and the possible observation deck, and recreational buildings could cause minor soil erosion. Erosion could also be caused by the minor clearing of vegetation needed in some areas around proposed recreational facilities, but generally previously used/cleared land would be used. The construction of the tactical trail could also cause minor soil impacts due to the clearing of vegetation. Hardening splash points and improving the boat landing could cause some erosion at the edge of the AIWW, but measures would be taken to prevent this during construction. Upgrading

existing utilities would require digging trenches, but these trenches would be covered and re-vegetated upon burial of the utility lines.

Mitigation measures would further reduce impacts. The application of best management practices during construction would be implemented to reduce potential impacts to soils. In addition, standard erosion control measures (e.g., silt fencing, sediment traps, application of water sprays, and re-vegetation of disturbed soils) would be implemented to further reduce potential impacts to soils during the construction phase. Therefore, ground-disturbing activities during construction would result in only minor and short-term impacts to soils.

The use of military vehicles on the tactical trail could cause erosion due to lack of vegetation. However, MCB Camp Lejeune has an active soil conservation program which addresses erosion caused by training exercises. The potential impact would be minimized by the use of Base Order P3570.1A, SOPs for Range Control. The Base Order requires operators to report eroded conditions along trails and at splash points to the Base Range Control Officer for remediation.

Part of the Proposed Action is to implement additional conservation practices, which would include planting native vegetation buffers. This would help slow and absorb rainwater runoff and channel flows away from sensitive areas, which would help to accomplish long-term control of erosion. Also, the hardening of splash points along the AIWW would help control erosion along these areas.

Overall, impacts to geology, topography, and soils would be minor due to implementing the OBMP.

4.8.1.2 No-Action Alternative

Under the No-Action Alternative, not to implement the OBMP, minor erosion and loss of land would continue to take place along the AIWW and the oceanfront. Large storms, especially northeasters and hurricanes would continue to pose a threat to the dune system and the stability of Onslow Beach itself. MCB Camp Lejeune personnel would continue to apply sedimentation, erosion, and land stabilization techniques to protect the shoreline.

4.8.2 Terrestrial Wildlife and Vegetation

Impacts to wildlife resources are considered significant if species or habitats of concern are adversely affected over relatively large areas or disturbances result in reductions in the population size or distribution of that species. Impacts to vegetation are based on the proportion of a plant species affected, sensitivity of that species, and the duration of those effects.

4.8.2.1 Proposed Action

Many components of the Proposed Action such as: designating land use; hardening splash points and improving the current boat landing; relocating the current pier and converting the

old pier into an observation platform or building a new observation deck and promoting outdoor recreation would all have minimal potential to affect wildlife or vegetation.

Overall, the impacts to wildlife and vegetation would be minor. Some vegetation would have to be cleared as a result of the tactical trail and fence/gate. There may be some minor clearing of vegetation for a few of the recreational facilities, but these buildings are primarily sited on previously used land. The implementation of additional conservation measures would include planting native vegetation across Onslow Beach to bridge areas between tracts of undisturbed land. This would improve the wildlife habitat in these areas by allowing a continuous tract of undisturbed habitat along the length of the barrier island.

The construction of the fence/gate may restrict the movement of larger species along the width of Onslow Beach in the vicinity of the SOTG compound. Many smaller species would be unaffected and would still be able to move freely through/over/under the fence. Species that would be inhibited would be whitetail deer, which could jump lower sections of the fence or swim/wade around the ends in the ocean or the AIWW.

Conservation measures include seasonal restrictions placed on the use of ORRVs during the sea turtle and shorebird-nesting season. Restrictions from the BO 11017.1F keep drivers off the beach during the nighttime hours when the lack of visibility makes animals and their nests susceptible to being run over. The construction of the fence/gate would limit access to the southwestern portion of the beach and keep out unauthorized users.

Another component of the Proposed Action is to control invasive plant species through manual removal, prescribed burning, and herbicide application. Prescribed burning is a common practice at MCB Camp Lejeune and is described and analyzed in the INRMP (MCB Camp Lejeune 2001). Approved herbicides and application methods will be used. No significant direct impact to wildlife would result from using approved herbicides at Onslow Beach.

4.8.2.2 No-Action Alternative

The decision not to implement the OBMP would result in no additional impacts to wildlife or vegetation.

4.8.3 Marine Species

Impacts to most marine species are judged based on the affect at a population level. The Marine Mammal Protection Act (MMPA) protects marine mammals from harassment, injury, or mortality.

4.8.3.1 Proposed Action

Most components of the Proposed Action such as: designating land use; constructing the gate/fence and the tactical trail; improving facilities in the recreation area; promoting outdoor recreation and implementing additional conservation measures have no potential to affect marine species.

The construction and use of the pier, splash points, and boat landing could potentially have minor affects on marine species. Small amounts of bottom habitat could be destroyed with the pouring of concrete ramps and placement of riprap for the boat landing and splash points. Likewise, sinking pilings for the pier and docks at the boat landing could also affect the bottom habitat. The area of impacts would be small and the ramps, pilings, and riprap would be quickly colonized, which would actually add another dimension to the habitat.

The partial or whole demolition of the existing Riseley Pier would lead to the displacement of some marine species that use the pilings of the pier for their habitat. Overall effects would be minor, and mobile species would find other suitable habitat. Many of the same species would use the proposed pier as habitat, if the proposed pier was constructed.

The proposed pier and boat docks could potentially cause shading, leading to a reduction in photosynthetic organisms (plants and algae) in the shaded portions. The proposed pier would be located in Onslow Bay, which is a sandy, high-wave-action area. It is unlikely that any plants or algae would be attached to the bottom in this area. Vegetation and algae do exist in the AIWW, where the boat landing would be located. The dock structures associated with this project component would comply with the height and width requirements stipulated by the USACE in the RHA Section 10 permit to lessen shading to the bottom community.

Overall, only minor impacts are expected to marine species as a result of the pier and docks.

4.8.3.2 No-Action Alternative

The decision not to implement the OBMP would result in no additional impacts to marine species.

4.8.4 Threatened and Endangered Species

Significant impacts to threatened and endangered species would occur if a listed species was injured, killed, or otherwise harassed; the critical habitat of a listed species was destroyed; or if the listed species' population was jeopardized. Avoiding areas that contain threatened and endangered species would minimize potential impacts.

4.8.4.1 Proposed Action

Most components of the Proposed Action such as: constructing the tactical trail; improving facilities in the recreation area; promoting outdoor recreation would have no potential to affect threatened or endangered species.

The activities on the AIWW, namely the hardening of splash points and the improvements to the boat landing, could disturb the American alligator. This reptile is only listed due to its similarity of appearance to the American crocodile. It would be highly unlikely to find an American crocodile in North Carolina as they are only occasionally found in the warmer waters of south Florida, the northern extent of their preferred habitat. Regardless, alligators

would be avoided during the construction of these facilities. There is no potential to affect the federally listed American crocodile.

The designation of land use would set aside areas that are primarily for conservation. Land use south of the South Tower within the area designated as Special Use Access would provide natural resource conservation areas. These conservation areas help facilitate the protection of green and loggerhead sea turtle nesting areas, piping plovers, and seabeach amaranth by promoting specific land use practices that would aid in their conservation.

Listed species habitat would be better protected with the installation of a fence/gate in the vicinity of the SOTG compound. The fence would separate the land use designation areas, and help keep unauthorized users from the southwestern beach. Unauthorized users may not be aware of the environmental concerns in this area and could therefore do damage to protected species. The fence/gate would therefore improve the conditions for federally threatened species at Onslow Beach.

The construction of a new pier and possible observation deck may cause minor short-term impacts to the seabeach amaranth, piping plover, and the loggerhead and green sea turtle. The unloading and staging of construction material, such as pilings for the new pier may temporarily disturb habitat suitable to the piping plover and the loggerhead and green sea turtle. Before construction is off loaded onto the beach the surrounding beach would be observed for the previously mentioned species to reduce impacts. The proposed observation deck site would be inspected for existing seabeach amaranth. During the construction phase of the pier and observation deck workers would be instructed to avoid impacting any federally threatened and endangered species.

Additional conservation measures include the restriction on the use of ORRVs on the beach from BO 11017.1F. ORRV driving is currently restricted to only the area between the Riseley Pier and the New River Inlet. Restrictions from the Riseley Pier to the South Tower include daytime ORRV use from April 1 to October 31 and day and nighttime use from November 1 to March 31 if no training is scheduled. In the area between the South Tower and the New River Inlet, ORRV use from April 1 to August 31 is prohibited. During September 1 to October 31 ORRV use is allowed during daylight hours and November 1 to March 31 ORRV use is allowed during day and night hours. The ORRV Base Order prohibits driving on vegetation, restricts access to the beach strand to designated ingress/egress points, and restricts vehicles on the beach strand to the area seaward of a set of markers placed between the high tide line and the first line of vegetation (MCB Camp Lejeune 2005).

Additional conservation measures to protect sea turtles would be to install shielded lights and other 'best available technologies' to minimize visible light at the beach. Sea turtles use natural light (i.e. moon and star light) cues at night to choose nesting sites and navigate. Females may not emerge and crawl up the beach to deposit eggs if the beach is not dark. Artificial light sources can disorient hatchling turtles and they can wander in the wrong direction, away from the ocean where they are susceptible to predators and dehydration (Witherington and Martin 1996). Measures to reduce light pollution at the beach would improve conditions for threatened green and loggerhead sea turtles.

4.8.4.2 No-Action Alternative

The No-Action Alternative, to not implement the OBMP, could result in the impacts to federally listed species, namely the loggerhead sea turtle and the seabeach amaranth. Authorized ORRV drivers would continue to drive on the narrowing beach which would increase the likelihood of running over a sea turtle or other listed species. Unauthorized ORRV drivers would also continue using the beach despite enforcement. Lack of a fence/gate makes it difficult to control access to the southwestern portion of the beach. This could also cause impacts to federally listed species or their habitat.

4.8.5 Essential Fish Habitat (EFH)

Threats to EFH generally include: navigation, dumping, sand and mineral mining, oil and gas exploration, development, transportation, commercial and industrial activities, and natural events.

4.8.5.1 Proposed Action

Implementation of the Proposed Action would not adversely affect EFH within the AIWW or Onslow Bay.

Most components of the Proposed Action such as: designating land use; constructing the fence/gate and tactical trail; improving facilities in the recreation area; promoting outdoor recreation and implementing additional conservation practices would have no potential to affect EFH.

Both hardening amphibious splash points and improving the existing boat landing would involve concrete ramps and riprap sloping into the AIWW. This concrete slab and riprap could potentially cover and destroy a small amount of existing EFH. Estuarine emergent wetlands, submerged aquatic vegetation, intertidal flats, and palustrine emergent and forested wetlands EFH would be avoided if possible. The current amphibious splash points are used frequently. Hardening them with concrete would not pose a significant impact to this already disturbed area. Likewise with the boat landing, the boat ramps exist and the area around the proposed improvements is already disturbed. The use of riprap to reinforce the bank would also provide good habitat for a diversity of small species of fish and other marine organisms. As these structures would sit on the bottom, little to no estuarine water column EFH would be disturbed. When design plans are available for the aforementioned projects, EFH consultations with NMFS and appropriate state agencies would take place if deemed necessary.

Constructing a new pier in the proposed recreation area and converting the old pier into an observation deck could have affects on the EFH in Onslow Bay. Live/hard bottom habitat; coral, coral reefs and artificial and manmade reefs are EFHs in Onslow Bay that are based on the bottom type. Considerable areas of live/hard bottom, patches of coral, and several artificial reefs are scattered in Onslow Bay (DON 2002a, 2003). These areas would be avoided when planning the exact location of the proposed pier.

Marine water column EFH would be affected, although the net result would be positive. Riseley pier has been in place for many years and is probably habitat for many marine species. However if the pier is not removed manually, large storms (including hurricanes) are likely to destroy the aging pier in the near future. Pilings supporting the new pier would provide dimension to the environment and unique habitat for marine species. The proposed pier would extend 900 feet into Onslow Bay, which is more habitat than the current pier provides at about 350 feet. Sargassum habitat EFH would be avoided if possible. The presence of this habitat within the project area is transient and dependent on surface currents that bring occasional mats of *Sargassum sp.* inshore from the floating beds that circulate in the Gulf Stream. No adverse effects to EFH would occur as a result of implementing the OBMP.

4.8.5.2 No-Action Alternative

The No-Action Alternative, not to implement the OBMP, would not adversely affect EFH. The current pier may eventually be taken by a large coastal storm, taking the shelter for marine organisms (pilings) with it.

4.9 Water Resources

4.9.1 Water Quality

Significant impacts to water resources could potentially occur if the Proposed Action causes contamination or sedimentation of nearby waters; endangers the health of the public or environment; or violates established laws or regulations.

Proper design and incorporating Best Management Practices during construction would minimize impacts to surface water. MCB Camp Lejeune has an active soil conservation program that addresses potential erosion problems caused by training activities. Measures such as vegetative buffers and berms will slow stormwater runoff, increase absorption, and direct water flow away from sensitive areas, thereby mitigating impacts to water resources. The state of North Carolina would require a 30 ft (9 m) setback for any construction at the sites, and sedimentation/erosion control measures for a period of ten years after the construction is complete (15A NCAC 02B.0300 *et seq.*). Erosion and sedimentation control would be implemented regardless of the alternative chosen within this PEA.

4.9.1.1 Proposed Action

Impacts to water quality would have no potential to occur due to designating land use or promoting outdoor recreation.

Construction of the fence/gate and tactical trail; hardened splash points and improved boat landing; the landside of the proposed pier and possible construction of a new observation deck; and buried utilities could cause erosion impacts leading to sedimentation and a reduction in water quality. Impacts would be identical to those described in the above Section 4.8.1 *Geology, Topography and Soils*. Likewise, effects due to the use of the

tactical trail and the planting of native vegetation would be identical to those described in Section 4.8.1. Overall, previously used land would be utilized whenever feasible to reduce impacts due to erosion and impervious surfaces would be minimized. Effects would be mitigated through application of MCB Camp Lejeune's soil conservation programs as detailed above.

As part of the Proposed Action, herbicide applications would be used to control invasive plant species. Herbicide application would consist of aerial and manual applications, and would not be sprayed over the open water. Herbicide applications would be performed in accordance with best management practices. No significant impacts to water resources would result from properly using glyphosate herbicide at Onslow Beach.

Chemicals and petroleum products that are stored at Onslow Beach as part of military training or recreation are stored in accordance with all applicable federal, state, and local laws. The implementation of the OBMP would not significantly increase the quantity of chemical or petroleum products stored there, nor would any additional chemicals be required as a result of the Proposed Action. No additional water quality impacts would occur as a result of the Proposed Action.

4.9.1.2 No-Action Alternative

The decision not to implement the OBMP would result in no additional impacts to water quality. Erosion along the banks of the waterways, and the resulting impacts to water quality, are an ongoing concern of MCB Camp Lejeune environmental staff.

4.9.2 Wetlands

Impacts to wetlands occur when these areas are filled, dredged, drained, or otherwise lose their characteristics and/or functionality. Wetlands are primarily protected through the Clean Water Act (CWA) of 1977, as Amended (Public Law 95-217, 33 U.S.C. 1251 *et seq.*). In addition, impacts to wetlands are governed by Executive Order 11990, Protection of Wetlands. Impacts to wetlands must be avoided, minimized, or mitigated.

4.9.2.1 Proposed Action

Most components of the Proposed Action such as: designating land use; building a new pier and converting the old pier into an observation deck (or constructing a new observation deck); improving facilities in the recreation area; promoting outdoor recreation and implementing additional conservation practices would have no potential to affect wetlands.

Constructing the fence/gate and tactical trail will require the filling of small parcels of wetlands. Fence posts for the fence/gate will be minor at less than 1 sq ft each, and only about half of the posts would be required to be placed in wetlands. Hardening splash points and improving the current boat landing could also require a few square feet of wetland fill with concrete and/or riprap. The tactical trail would be the largest potential wetland impact because about half of the trail crosses wetland areas. The trail is 25 feet wide by 3,500 feet long that would involve approximately 2 acres of wetlands to be filled to accomplish this

construction. The trail would be made from packed gravel, and would not include any impervious surfaces. Culverts would be placed under the trail where necessary to allow for natural ebb and flow of tidal waters into the landward side of the tactical trail.

Improving the facilities in recreation area would include creating new lodging areas. A few of these lodges may overlap the boundary of the wetlands. Lodges and other recreational facilities would be sited to avoid wetlands if possible. Most facilities associated with the Proposed Action are being placed on previously used land.

Overall, wetland impacts and mitigation measures will be negotiated with the USACE during the permitting process. Final design plans will be used along with current surveys to establish the exact areas of wetland fill. Areas with the potential to be successful mitigation areas exist on Onslow Beach. Mitigation procedures would be established during permitting procedures.

4.9.2.2 No-Action Alternative

The No-Action Alternative, to not implement the OBMP, would not result in any additional impacts to wetlands.

4.9.3 Floodplains

Floodplain impacts include the potential for flood damage to facilities and the reduction of water holding capacity within the floodplain. Nearly all of Onslow Beach is within the 100-yr floodplain. However, the AIWW, two inlets, and the Atlantic Ocean border this barrier island and rainwater runoff flows directly into these bodies of water. Therefore, changes in water holding capacity of the Onslow Beach 100-yr floodplain would not affect any other areas on the mainland. MCB Camp Lejeune would follow required setback rules for all structures constructed at Onslow Beach. Flooding from large coastal storms such as hurricanes pose much more severe of a threat than flooding from rainwater.

4.9.3.1 Proposed Action

Project components of the Proposed Action would have no potential to be affected by floodwaters are: designation of land use; constructing the fence/gate and tactical trail; hardening splash points and improving the boat landing; constructing a new pier and converting the current pier into an observation deck (or constructing a new observation deck); promoting outdoor recreation and implementing additional conservation practices. These projects either do not involve the construction of any facilities or damage by floodwaters is unlikely because structures such as piers and boat ramps are designed to withstand flooding and wave energy.

The improvements in the recreation area involve the construction of buildings, pavilions, parking lots, pre-constructed lodges, playgrounds and other facilities in the 100-yr floodplain. Many structures such as the lodges and pavilions are elevated on pilings or posts that allow water and wave energy to move unrestricted, and therefore damage would be less likely when flooding occurs. Other projects in this area involve buildings with slab

construction and walled ground floors. These structures will be sited with the required setback from the dune system, but would be susceptible to flooding. Areas such parking lots and other open spaces would be relatively unaffected by floodwaters. Impacts to facilities located within this floodplain would result when a 100-yr flood occurs.

When detailed engineering plans are available the floodplain impacts would be reevaluated and all applicable local, state, and federal regulations will be followed.

4.9.3.2 No-Action Alternative

The No-Action Alternative, not to implement the OBMP, would involve no additional construction and therefore would have no additional impacts to floodplains.

4.10 Safety

Safety impacts would occur if implementation of the Proposed Action would substantially increase risks to the public or military personnel.

4.10.1 Proposed Action

Most components of the Proposed Action such as: hardening splash points improving the boat landing; building a new pier and converting the old pier into an observation deck (or constructing a new observation deck); constructing a new pier and converting the current pier into an observation platform; improving facilities in the recreation area; promoting outdoor recreation and implementing additional conservation practices would not cause any adverse impacts to safety at Onslow Beach.

The designation of land use will have a positive impact on safety. This would partition the beach into distinct recreation and training areas, helping to deconflict activities and plan for appropriate future uses in each area. The construction of the fence/gate would reinforce this land use designation by physically separating the training and recreation areas. This would keep out beach patrons during training exercises, greatly reducing the risk of an accident with a bystander.

The tactical trail would also increase safety at Onslow Beach. This trail would allow tactical vehicles to avoid driving on Ocean Drive and most of Onslow Beach Road. These are the areas where private vehicles, pedestrians, and tactical vehicles (some tracked and weighing many tons) intermingle to cause potential safety issues. Additionally, pedestrian crosswalks would be installed over the tactical trail to allow recreational users to safely access the AIWW from the main recreational area. Segregating these vehicles from the beach patrons will increase safety considerably at Onslow Beach.

The restrictions to ORRV driving include a measure to keep ORRV drivers and their vehicles out of the training area when exercises are ongoing. This will reduce the number of conflicts between recreational and military vehicles and considerably improve safety.

Overall, the implementation of the OBMP includes many components that would have a significant improvement on safety at Onslow Beach.

4.10.2 No-Action Alternative

The No-Action Alternative, to not implement the OBMP, would result in a continued safety risk to beach patrons and military personnel. Tactical vehicles and private vehicles would continue to conflict along the beach and roadways of Onslow Beach.

4.11 Aesthetics

Impacts to aesthetics are based on users' expectations and the context of the surrounding area. In the case of Onslow Beach, users were polled and preferred low-impact development and maintaining much of the natural setting as opposed to a resort beach setting with high-rise hotels and dense development.

4.11.1 Proposed Action

Components of the Proposed Action have no potential to change the aesthetic setting are: designating land use; hardening splash points and improving the boat landing; and promoting outdoor recreation. These projects either involve no construction projects or are minor improvements to existing facilities.

The proposed improvements, limited development of previously used land, possible construction of an observation deck in the vicinity of Riseley Pier, and the construction of a new pier in the recreation area will not significantly affect the aesthetic qualities of Onslow Beach. Buildings will be limited to two floors, with the required setback from the dune system. This will preserve the natural setting of the beach and the development would be in keeping with users expectations as a natural setting with beach community type development. The addition of a fishing pier is also very much in character with this beach development concept, and a primary attraction for visitors to Onslow Beach, as is the current pier. Overall, the Proposed Action would have no significant impacts on aesthetics; the aesthetic qualities that make Onslow Beach unique will be preserved.

Implementing conservation measures will have a positive impact on the aesthetic qualities of Onslow Beach. Additional conservation measures would include planting tracts of native vegetation through previously cleared areas. This would lend a more natural characteristic and provide a visual buffer for the recreational areas. Significant improvements to aesthetics would result from planting native vegetation.

4.11.2 No-Action Alternative

The no action alternative, to not implement the OBMP would result in no potential to impact aesthetics at Onslow Beach.

4.12 Cumulative Impacts

Cumulative impacts have been defined by the Council on Environmental Quality (CEQ) in 40 CFR 1508.7 as:

"Impacts on the environment, which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

The CEQ regulations further require that NEPA environmental analyses address connected, cumulative, and similar actions in the same document (40 CFR 1508.25). This requirement prohibits segmentation of a project into smaller components to avoid required environmental analysis.

In assessing the implementation of the OBMP's contribution to cumulative impacts, the past, present, and reasonably foreseeable future actions were considered and analyzed.

4.12.1 Erosion and Sedimentation

The Base contains many ditches, streams, rivers, and other bodies of water including the New River, the AIWW, and Onslow Bay (Atlantic Ocean). Overall, the potential for erosion/sedimentation is low considering the relatively flat terrain and that much of the soil on-base has a low potential for water and wind erosion (USDA 1992). Cumulative impacts are considered throughout MCB Camp Lejeune and in the New River watershed.

The construction projects associated with the OBMP would have the potential to add to the erosion of the shoreline and subsequent sedimentation into the AIWW and Onslow Bay. Most of these construction projects will have only minor erosion and sedimentation impacts because most projects are sited on previously developed land and require little to no grading or filling. Additionally, part of the Proposed Action is to plant native vegetation as stormwater runoff buffers around proposed sites. Therefore, the actions proposed by the OBMP would not have a significant contribution to sedimentation and erosion at MCB Camp Lejeune or in the New River watershed.

During construction the application of best management practices would also be implemented to reduce potential impacts to soils. Standard erosion control measures (e.g., silt fencing, sediment traps, application of water sprays, and re-vegetation of disturbed soils) would be implemented to further reduce potential erosion sedimentation impacts.

4.12.2 Threatened and Endangered Species

The conservation of threatened and endangered species is a primary concern at MCB Camp Lejeune. Federally listed species are protected by ESA, and harassing, injuring, or killing a federally listed species is against the law without special permits. The 2002 Biological Assessment/Biological Opinion (MCB Camp Lejeune 2002) on the use of Onslow Beach spells out many measures to protect threatened and endangered species. The appropriate

geographical scale to analyze cumulative impacts to threatened and endangered species is over the range of a particular species.

The implementation of the OBMP along with the BO 11017.1F introduce further measures to protect threatened and endangered species such as the green and loggerhead sea turtles; the piping plover; and the seabeach amaranth at Onslow Beach. Restricting the ORRV's in the area southwest of the current pier to daytime use during sea turtle nesting season will offer additional protection to nesting mothers and hatchlings which typically transit the beach at night. Reducing light pollution at Onslow Beach will also help restore natural lighting conditions that the sea turtles use as visual cues.

MCB Camp Lejeune has management plans for threatened and endangered species aboard the base including sea turtles (green and loggerhead), red cockaded woodpecker, and rough-leaved loosestrife. Turtle nesting beaches such as those provided by MCB Camp Lejeune, offer a relatively safe and controlled place for these species to nest.

Overall, implementing the OBMP will have a positive effect on the threatened and endangered species encountered at Onslow Beach.

4.13 Unavoidable Adverse Impacts

The Proposed Action would not result in any significant direct or indirect unavoidable adverse impacts. Any impacts incurred would be minor and/or temporary.

Minor unavoidable impacts would include limiting near shore navigation out to 900 feet in the vicinity of the proposed pier; flood danger due to placing facilities within the 100-year floodplain; taking of a few acres of wetlands although these effect will be mitigated; causing minor erosion due to construction of facilities, although these effects would be mitigated; and restricting ORRV use, which would impact recreation.

4.14 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would result in the use of little new land. Much of the land proposed for use was previously developed. Notable exceptions include land used for the tactical trail. The construction of fence/gate, tactical trail, hardened splash points, improved boat landing, a new pier, observation platform (from current pier or construction of a new observation deck) and recreational facilities would expend fuel, construction materials, and labor. Other components of the Proposed Action would expend funding and labor for the promotion of outdoor education and the implementation of additional conservation practices.

4.15 Relationship Between Local Short-Term Uses of the Environment and the Enhancement of Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment, and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. Short-term uses of the environment are those that occur over a period of less than the life of the Proposed Action. Long-term uses include those impacts that would persist for a period of five years or more, or for the life of the Proposed Action.

Implementation of the OBMP would result in both short-term environmental effects and long-term productivity. Short-term effects would be primarily related to construction activities for the proposed facilities. Proposed construction activities would result in facility improvements that would enhance the long-term recreational opportunities at Onslow Beach. The Proposed Action would not result in significant impacts on sensitive resources. Furthermore assigning land used designations for areas of Onslow Beach would improve the use and planning for any additional development in the future. As a result, it is not anticipated that the Proposed Action would result in any environmental impacts that would permanently narrow the range of beneficial uses of the environment or pose long-term risks to health, safety, or the general welfare of the public.

4.16 Mitigation Measures

The following measures would minimize the effects during the implementation of the OBMP:

- Native vegetation would be restored in training and recreational areas of the beach, where practical, to buffer stormwater runoff and create tracts of native vegetation.
- Dune stabilization measures would continue under the OBMP according to the *Biological Assessment and Opinion on the Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach* (2002). The use of sand fencing, planting native beach grasses, and placing Christmas trees in the dunes would help stabilize the dune system
- State-approved erosion and sedimentation control plans would be implemented if they were necessary for any construction activities.
- If any artifacts or other cultural resources are encountered during construction, work would cease and the MCB Camp Lejeune Environmental Management Division would be contacted to investigate and identify additional archaeological survey requirements and mitigation measures that might be needed.
- All construction activities would be conducted in a manner that is consistent with the enforceable policies of the NC Division of Coastal Management.

- Development of the proposed tactical trail would involve encroachment on the surrounding delineated wetlands. Mitigation of the potential loss of wetlands would include development of replacement wetlands or other mitigation measures permitted by the USACE. In addition to mitigation, a CWA Section 401 Water Quality Certification from the North Carolina Division of Water Quality would be required if there are impacts to water quality or wetlands.

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Appendix A

Federal and State Listed Species

Onslow County, State and Federally Listed Species

53 records found

Major Group	Scientific Name	Common Name	State Status	Federal Status	State Rank	Global Rank	County Status
Mammal	Neotoma floridana floridana	Eastern Woodrat - Coastal Plain Population	T	-	S1	G5T5	Current -
Mammal	Puma concolor couguar	Eastern Cougar	E	E	SH	G5TH	Historic -
Mammal	Trichechus manatus	West Indian Manatee	E	E	S1N	G2	Current -
Bird	Aimophila aestivalis	Bachman's Sparrow	SC	FSC	S3B,S2N	G3	Current -
Bird	Ammodramus henslowii	Henslow's Sparrow	SR	FSC	S2B,S1N	G4	Current -
Bird	Charadrius melodus	Piping Plover	T	T	S2B,S2N	G3	Current -
Bird	Haliaeetus leucocephalus	Bald Eagle	T	LT (PD)	S3B,S3N	G4	Current -
Bird	Laterallus jamaicensis	Black Rail	SR	FSC	S3B,S2N	G4	Current -
Bird	Passerina ciris ciris	Eastern Painted Bunting	SR	FSC	S3B,SZN	G5T3T4	Current -
Bird	Picoides borealis	Red-cockaded Woodpecker	E	E	S2	G3	Current -
Bird	Rynchops niger	Black Skimmer	SC	-	S3B,S3N	G5	Current -
Bird	Sterna antillarum	Least Tern	SC	-	S3B,SZN	G4	Current -
Bird	Sterna hirundo	Common Tern	SC	-	S3B,SZN	G5	Current -
Bird	Sterna nilotica	Gull-billed Tern	T	-	S3B,SZN	G5	Historic -
Reptile	Alligator mississippiensis	American Alligator	T	T(S/A)	S3	G5	Current -
Reptile	Caretta caretta	Loggerhead	T	T	S3B,S3N	G3	Current -
Reptile	Chelonia mydas	Green Turtle	T	T	S1B,SZN	G3	Current -
Reptile	Crotalus adamanteus	Eastern Diamondback Rattlesnake	E	-	S1	G4	Current -
Reptile	Crotalus horridus	Timber Rattlesnake	SC	-	S3	G4	Obscure -
Reptile	Dermochelys coriacea	Leatherback	E	E	SAB,SZN	G2	Current -
Reptile	Heterodon simus	Southern Hognose Snake	SC	FSC	S2	G2	Current -
Reptile	Malaclemys terrapin centrata	Carolina Diamondback Terrapin	SC	-	S3	G4T4	Current -
Reptile	Micrurus fulvius	Eastern Coral Snake	E	-	S1	G5	Current -
Reptile	Ophisaurus mimicus	Mimic Glass Lizard	SC	FSC	S2	G3	Current -
Reptile	Sistrurus miliarius	Pigmy Rattlesnake	SC	-	S3	G5	Current -
Amphibian	Rana capito	Carolina Gopher Frog	T	FSC	S2	G3	Current -
Fish	Acipenser brevirostrum	Shortnose Sturgeon	E	E	S1	G3	Historic -
Insect	Agrotis sp 1 nr buchholzi	a dart moth	SR	FSC	S2S3	G2G3	Obscure -
Insect	Atrytonopsis sp 1	an undescribed	SR	FSC	S1?	G1?	Current -

Major Group	Scientific Name	Common Name	State Status	Federal Status	State Rank	Global Rank	County Status
		skipper					
Vascular Plant	Allium sp 1	Savanna Onion	SR-L	FSC	S1	G1	Current -
Vascular Plant	Amaranthus pumilus	Seabeach Amaranth	T	T	S2	G2	Current -
Vascular Plant	Asplenium heteroresiliens	Carolina Spleenwort	E	FSC	S1	G2Q	Historic -
Vascular Plant	Calopogon multiflorus	Many-flower Grass-pink	E	FSC	S1	G2G3	Current -
Vascular Plant	Carex lutea	Golden Sedge	E	E	S1	G1	Current -
Vascular Plant	Cystopteris tennesseensis	Tennessee Bladder-fern	E-SC	-	S1	G5	Historic -
Vascular Plant	Dichanthelium hirstii	Hirsts' Panic Grass	E	C	S1	G1	Current -
Vascular Plant	Dionaea muscipula	Venus Flytrap	SR-L, SC	FSC	S3	G3	Current -
Vascular Plant	Litsea aestivalis	Pondspice	SR-T	FSC	S2	G3	Current -
Vascular Plant	Lobelia boykinii	Boykin's Lobelia	SR-T	FSC	S1	G2G3	Current -
Vascular Plant	Lophiola aurea	Golden Crest	E	-	S1	G4	Current -
Vascular Plant	Lysimachia asperulifolia	Rough-leaf Loosestrife	E	E	S3	G3	Current -
Vascular Plant	Muhlenbergia torreyana	Pinebarren Smokegrass	E	-	S1	G3	Current -
Vascular Plant	Myriophyllum laxum	Loose Watermilfoil	T	FSC	S1	G3	Current -
Vascular Plant	Parnassia caroliniana	Carolina Grass-of-parnassus	E	-	S2	G3	Current -
Vascular Plant	Plantago sparsiflora	Pineland Plantain	E	FSC	S1	G3	Current -
Vascular Plant	Platanthera integra	Yellow Fringeless Orchid	T	-	S1	G3G4	Historic -
Vascular Plant	Rhexia aristosa	Awned Meadow-beauty	T	FSC	S3	G3	Current -
Vascular Plant	Rhynchospora decurrens	Swamp Forest Beaksedge	SR-P	FSC	S1	G3G4	Current -
Vascular Plant	Rhynchospora thornei	Thorne's Beaksedge	E	FSC	S1	G1G2	Current -
Vascular Plant	Solidago pulchra	Carolina Goldenrod	E	FSC	S3	G3	Current -
Vascular Plant	Solidago verna	Spring-flowering Goldenrod	SR-L	FSC	S3	G3	Current -
Vascular Plant	Thalictrum cooleyi	Cooley's Meadowrue	E	E	S1	G1	Current -
Vascular Plant	Utricularia olivacea	Dwarf Bladderwort	T	-	S2	G4	Current -

From: www.ncsparks.net/nhp/county.html

Search conducted: 29 December 2003

State Status

Code	Status
E	Endangered
SR	Significantly Rare
T	Threatened
EX	Extirpated
SC	Special Concern
P	Proposed (used only as a qualifier of the ranks above)
C	Candidate

NOTE: the definitions of state statuses of plants and animals differ. Below are summaries of the statuses for each group.

Plant statuses are determined by the Plant Conservation Program (NC Department of Agriculture) and the Natural Heritage Program (NC Department of Environment and Natural Resources). Endangered, Threatened, and Special Concern species are protected by state law (Plant Protection and Conservation Act, 1979). Candidate and Significantly Rare designations indicate rarity and the need for population monitoring and conservation action. Note that plants can have a double status, e.g., E-SC, indicates that while the plant is endangered, it is collected or sold under regulation.

Code	Status
E	Endangered
T	Threatened
SC	Special Concern
C	Candidate
SR	Significantly Rare
-L	Limited
-T	Throughout
-D	Disjunct
-P	Peripheral
-O	Other
P-	Proposed

Animal statuses are determined by the Wildlife Resources Commission and the Natural Heritage Program. Endangered, Threatened, and Special Concern species of mammals, birds, reptiles, amphibians, freshwater fishes, and freshwater and terrestrial mollusks have legal protection status in North Carolina (Wildlife Resources Commission). The Significantly Rare designation indicates rarity and the need for population monitoring and conservation action.

Code	Status
E	Endangered
T	Threatened
SC	Special Concern
SR	Significantly Rare
EX	Extirpated
P	Proposed

Federal Status

These statuses are designated by the US Fish and Wildlife Service. Federally listed Endangered and Threatened species are protected under the provisions of the Endangered Species Act of 1973, as amended through the 100th Congress. Unless otherwise noted, definitions are taken from the *Federal Register*, Vol. 56, No. 225, November 21, 1991 (50 CFR Part 17).

Code	Status
E	Endangered
T	Threatened
EXN	Endangered, nonessential experimental population.
T(S/A)	Threatened due to Similarity of Appearance.
C	Candidate.
FSC	Federal "Species of Concern"
PE	Proposed Endangered
PD	Proposed De-listed

Additional Definitions:

Elements within a county or quad are subdivided into "Current", "Historic", "Obscure" or "Potential" records.

Current record: the element was last observed in the county or quad at most 20 years ago.
Historic record: the element was last observed in the county or quad more than 20 years ago.
Obscure record: the date the element was last observed in the county or quad is uncertain.
Potential record: the element has the potential to be found in the county or quad.

NOTE: Scientific and common names listed in parentheses are synonyms listed in US Fish and Wildlife Service, 1992, Endangered and Threatened Species of the Southeastern United States (The Red Book).

Appendix B

Onslow Beach Master Plan

April 2006

Onslow Beach
Master Plan

Marine Corps Base,
Camp Lejeune, NC

April 2006

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Table of Contents

Chapter 1 Introduction

1.1 Purpose and Need

Established in May 1941, Marine Corps Base (MCB) Camp Lejeune provides specialized training to prepare troops for amphibious and land combat operations. One of the most critical components for that training is Onslow Beach.

Onslow Beach and Brown's Island cover approximately 11 miles of beachfront with the associated primary and secondary dune systems grading to maritime shrub-scrub and tidal saltmarsh along the AIWW. Onslow Beach is separated from Brown's Island by Brown's Inlet. The beach ecosystem is extremely dynamic, influenced by both natural and man-made processes.

Activity levels on Onslow Beach vary in intensity and nature. Recreational uses, military training, and conservation activities overlap spatially and temporally. Competing uses sometimes create logistical, environmental, and safety issues. The beach provides habitat for several species protected under the Federal Endangered Species Act in addition to several species of concern identified by the state of North Carolina.

This document provides an integrated and comprehensive plan to manage this ecosystem while continuing to support mission related and recreational uses. It is a strategic document, outlining opportunities for integrating management and use of Onslow Beach to ensure its sustainability for the future.

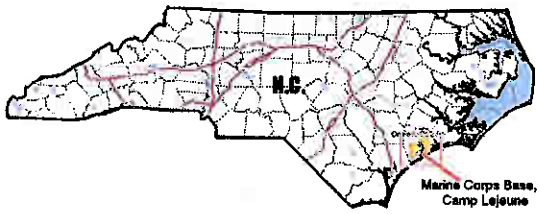
Projects that develop out of the goals and objectives identified in this plan will undergo further environmental analysis and review.

1.2 MCB Camp Lejeune

Located approximately 300 miles south of Washington, D.C., and 222 miles north of Charleston, S.C., Camp Lejeune occupies 153,000 acres with a diverse array of ecosystems composed of wildlands, urban areas, and surface water resources. Over 100,000 acres of land are in forests and other wildlands. Water resources include approximately 11 miles of beach on the Atlantic Ocean and 26,000 acres of estuaries containing the New River, Atlantic Intracoastal Waterway (AIWW), and associated streams and marshes.

The Base houses six major Marine Corps commands and two Navy Commands.

Figure 1.1 Location of MCB Camp Lejeune, NC



1.3 Summary of Drivers

1.3.1 Military Mission

The mission of Camp Lejeune is to maintain combat-ready units for expeditionary deployment. Onlsow Beach is a critical training ground for meeting this mission.

1.3.2 Current Management and Planning Documents

Several documents provide guidance for environmental considerations on Onslow Beach, including:

- Biological Assessment and Opinion on the Effects of Current Use and Modification of Training Areas, Dune Stabilization, and continued Recreational Use of Onslow Beach, Marine Corps Base Camp Lejeune (2002)
- Beach Erosion and Hurricane Protection Plan for Marine Corps Base Camp Lejenene, North Carolina (1999)
- Integrated Natural Resources Management Plan for Marine Corps Base, Camp Lejeune, North Carolina (2001)
- Environmental Assessment and Finding of No Significant Impact and Finding of No Significant Impact for Maintenance Dredging of the Atlantic Intracoastal Waterway — Beaufort to Cape Fear River Reach, Onslow County, North Carolina (1997)
- Base Order 11017.1F Use of Off-Road Recreational Vehicles (ORRV) (March 2005)
- Base Order P3570.1A Standing Operating Procedures for Range Control (April (2003)
- Base Order 5090.11 Protected Species Program (August 2005)

1.4 Plan Organization and Use

This document is presented in six chapters:

Chapter 1, Introduction, describes the purpose and need, summary of drivers and plan organization.

Chapter 2, Affected Environment, describes Onlsow Beach: its location, soils, hydrology, wildlife and vegetation.

Chapter 3, Current Uses, describes current use of Onslow Beach for recreation, training and environmental conservation.

Chapter 4, The Future of Onslow Beach, describes prospects for development of the beach area that will support the military mission while providing additional recreational and conservation opportunities.

Chapter 5, Integrated Sustainability, discusses administrative and regulatory measures that can promote the sustainability of Onslow Beach.

Chapter 6, Implementation, provides proposed projects and a timeline for implementation.

There are also five appendices, which include CAMA guidelines for development, vegetation identified on Onslow Beach by community type, a list of vegetation species on Onslow Beach, sea turtle monitoring protocols, and a landscape architect's renderings of proposed development on the beach.

Chapter 2 Affected Environment

2.1 Onslow Beach Island

Onslow Beach is a 17.7 km-long barrier island bordered by New River Inlet to the south and Bear Inlet to the north (Figure 2.1).

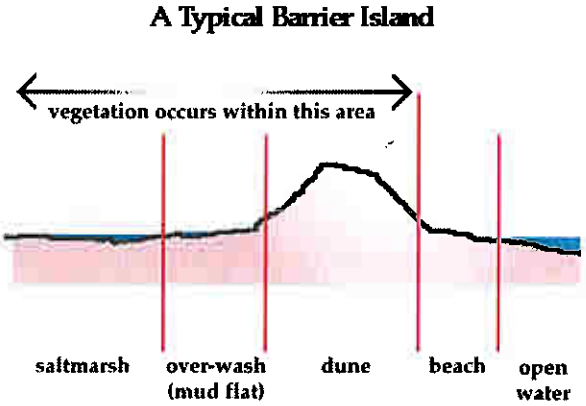
Figure 2.1 (map) Onslow Beach, NC.

2.1.1 Barrier Island Geology and Dynamics

Barrier islands are long, narrow islands formed by sediment deposition that parallel the coastline. The USGS describes five typical zones of a barrier island (Figure 2.2):

- open water
- beach
- dune
- over-wash (mud flat)
- saltmarsh

Figure 2.2 Various zones of a typical barrier island

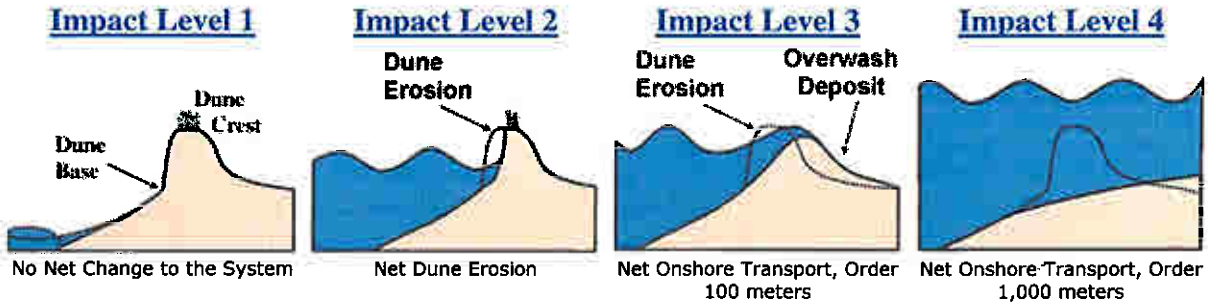


Barrier island ecosystems are extremely dynamic as ocean waves and currents shift and replace existing sand and sediment, and winds and storms affect dune development and stability. Freudenrich (2003) describes the following barrier island dynamics.

Waves deposit and remove sediment from the ocean side of the island. Currents, that hit the island at an angle, redistribute sand from one end of the island to the other. Tides move sediment into the salt marsh, building up the mainland side of the island as the ocean side erodes. Winds contribute to dune and marsh build up as sand is pushed up from the beach. Finally, storms create overwash areas and erode beaches and other portions of barrier islands.

The USGS "hazard scale" helps define impacts of storms on barrier islands (Figure 2.3). At level 1, wave erosion is confined to the beach area and sands are replenished as waves deposit sand along the beach.

Figure 2.3 Storm impact hazard scale (Courtesy USGS coastal.er.usgs.gov).



At level 2, waves erode the dune and cause the dune to retreat. There is a semi-permanent or permanent change in the system. At level 3, wave action exceeds the dune's elevation, destroying the dune and creating an overwash. At level 4, the storm surge completely covers the island, affecting permanent change to the island. The dune system is destroyed and overwash >1km occurs.

2.1.2 Recent Storm History

Hurricanes are the most destructive natural disturbance on the barrier islands of North Carolina. The Atlantic hurricane season lasts from 1 June to 30 November, and includes an average of 5.4 hurricanes/year. The following storms significantly altered Onslow Beach Island in the past decade.

Bertha
Hurricane Bertha, a category 2 hurricane, made landfall 12 July 1996 at Wilmington, NC. The storm caused an estimated $20 million in damage at Camp Lejeune ($270 million overall). 2,700 roofs were damaged and 179 homes hit by falling trees (Hurricane damage leaves Camp Lejeune with huge clean-up. Cpl. Joseph Gray. 7/26/96. Henderson Hall News)

Fran
Hurricane Fran, a category 3 hurricane, made landfall 6 September 1996 at Cape Fear, NC.

Sustained winds greater than 100 knots affected Brunswick, New Hanover, Pender, Onslow, and Carteret Counties. Total damage was estimated at 3.2 billion.

According to American Forces Press Service at the time, damage at Camp Lejeune was estimated at $21 million. Damage included nearly 4,000 homes and three hangars at New River Air Station. Recreational housing, pavilions, and sewage systems at Onlsow Beach suffered extensive damage and there was significant sand displacement on the beach. (North Carolina Bases Assess Fran's Damage, 1997).

Bonnie
Hurricane Bonnie was a category 3 hurricane that made landfall near Cape Fear, NC on 26 August 1998. Bonnie had maximum wind speeds of 115 mph, but winds were dispersed and therefore less damaging.

Onslow Beach is a photo reference point for a long-term USGS study that is characterizing the effects of hurricanes on coastal resources. Figure 2.4 shows the shoreline after Hurricanes Bertha, Fran, and Bonnie.

Floyd

Although Hurricane Floyd was only classified as a Class 2 hurricane, it is ranked as the third costliest U.S. hurricane of the past century (not adjusted for inflation, source: www.aoml.noaa.gov).

Floyd made landfall just south of Camp Lejeune on 15 September 1999, and caused significant flooding and beach erosion; the Army Corps of Engineers estimated the "sand loss from beaches averaged 100 cubic yards of material per foot of beach."

Base Order 3440.6D describes the Destructive Weather Plan for MCB Camp Lejeune.

2.1.3 Soils

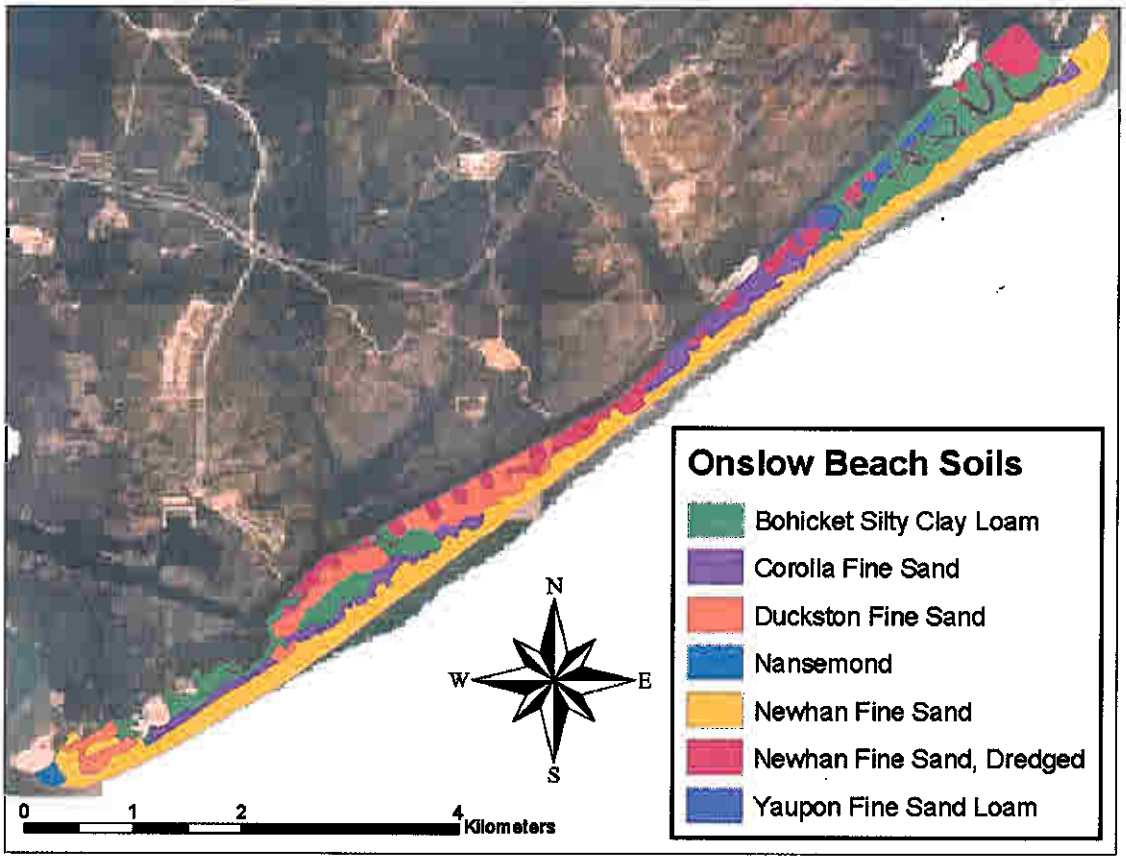
Soils on the island range from coarse shifting sands to young, poorly developed sandy soils. Soil series on the island include Newhan, Corolla, Duckston and Fripp (Figure 2.5).

The Newhan series consists of excessively drained soils, formed from sands deposited by wind. Slopes range from 0 to 30 percent. Mean annual temperature is 63 degrees F., and mean annual precipitation is 54 inches.

The Corolla series consists of moderately well and somewhat poorly drained soils formed in sandy sediments along the Atlantic Coast. Slope ranges from 0 to 6 percent.

Figure 2.4 A reference point (red arrow) can be used to compare beach characteristics after Hurricanes Bertha, Fran, and Bonnie (photos courtesy USGS).

Figure 2.5 Soil Series on Onslow Beach, MCB Camp Lejeune, NC.



The Duckston series consists of poorly drained sands near the coast. These soils are in shallow depressions between coastal dunes and on nearly level flats between the dunes and the marshes. Slopes are 0 to 2 percent. Average annual precipitation near the type location is about 53 inches and mean annual temperature is about 62 degrees F.

The Fripp series consists of very deep, excessively drained, rapidly permeable soils that formed in thick sandy sediments adjoining beaches and waterways along the coast. The soils are in undulating to steep topography near the seacoast. Slopes range from 2 to 30 percent.

2.1.4 Hydrology

Hydrology on Onslow Beach ranges from the excessively drained sands and sandy soils of dunes and maritime shrub communities to the poorly drained soils of freshwater and tidal marshes.

2.1.5 Erosion

According to Cleary and Riggs (1999), erosion is greatest at the south end of the island, with 4-20 feet lost per year between the New River inlet and South Tower. From the vicinity of South Tower to North Tower, the rate is 2-4 feet/year and from North Tower to Brown's inlet, the rate is 1-6 feet/year.

Coastal management determines erosion rates for different sections of the State's ocean shoreline by analyzing a time-series of aerial photographs dating back to the 1930s. Erosion rates are updated every five years and are adopted by the CRC.

The Coastal Zone Management Act requires that all developments be setback a prescribed distance from the "first line of stable natural vegetation" to protect lives and property from storm damage and erosion. The first line of stable natural vegetation is the first area on the oceanfront where natural dune-stabilizing plants such as sea oats and American beachgrass are present.

Setback distances are determined based on the erosion rates described above. Figure 2.6 shows average rates of shoreline change over the past 50 years, and required setback factors for Onslow Beach.

Appendix A contains regulations for Ocean Hazard Areas of Environmental Concern.

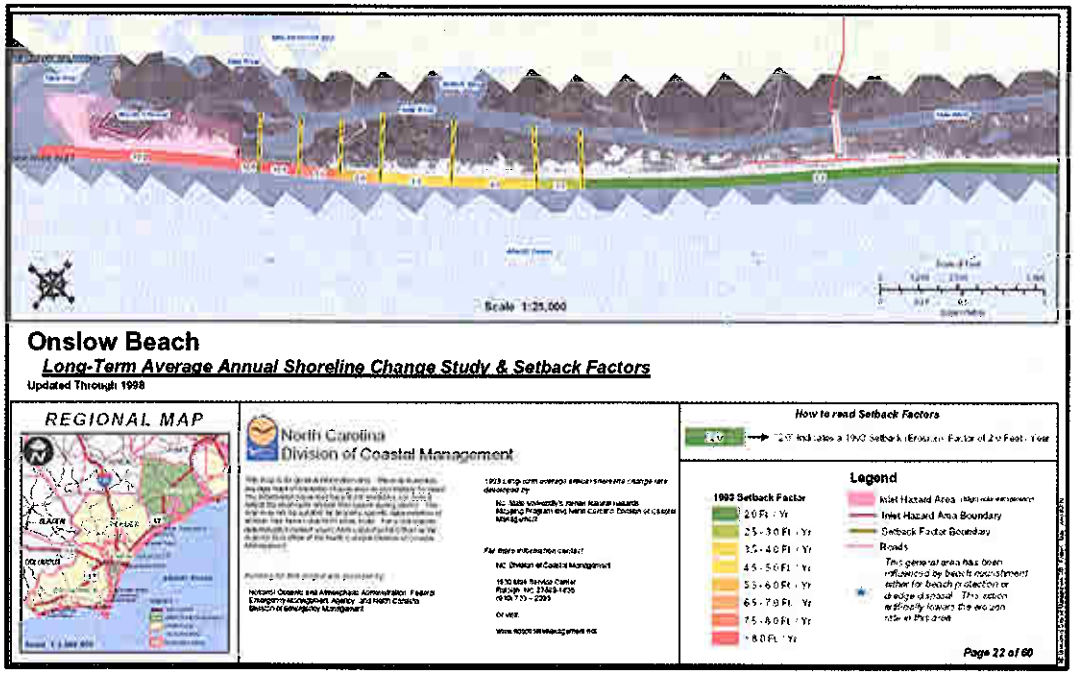
2.1.6 Natural Communities

Schafall and Weakley (year) describe six natural communities for the island:

- upper beach
- dune grass
- maritime dry grassland
- maritime shrub
- maritime evergreen forest
- maritime deciduous forest

A full description of each community is available in Appendix B.

Figure 2.6 Long-term average annual shoreline change study and setback factors for Onslow Beach (updated through 1998).



2.2 Onslow Beach/Project Area

This report focuses on future use and development of the area shown in Figure 2.7.

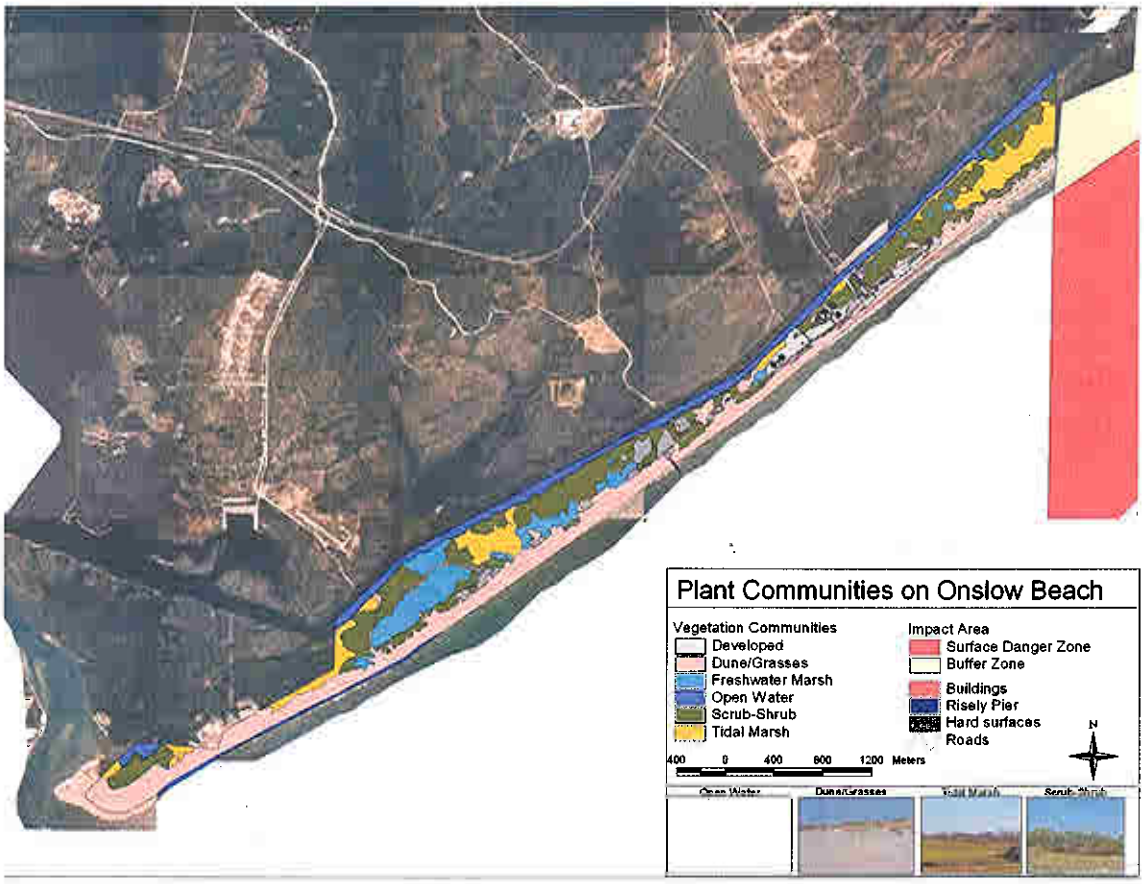
Figure 2.7 Project Area

2.2.1 Vegetation

MCB Camp Lejeune contracted Versar, Inc. to identify plant communities and land cover types on Onslow Beach in 2003. Appendix C contains principal plant species that occur in each of five community types (Figure 2.8) identified by Versar, Inc:

- Open water
- Upland dune
- Coastal shrub/scrub
- Freshwater marsh
- Tidal marsh

Figure 2.8 Plant communities on Onslow Beach



2.2.2 Wildlife

Onslow Beach provides excellent habitat (nesting, foraging, over-wintering) for many varieties of bird species including migratory waterfowl such as blue and green-winged teal, black ducks, and resident wood ducks. Protected shorebirds and colonial nesting birds such as least tern, piping plover, American Oyster-catcher, and Wilson's plovers utilize Onslow Beach for varying periods throughout the year.

EMD manages a 77-acre brackish-water impoundment at Onslow Beach that provides seasonal habitat for open water species such as teal, redhead, and gadwall. Wading birds including various egrets, herons, lesser yellowlegs, and a number of different plovers and sandpipers utilize the impoundment at varying times of the year in response to water forage availability and water level management actions within the impoundment.

As a result of hurricanes during the mid- to late 1990's, functionality of the Onslow Beach impoundment has been severely affected. Initiatives to improve water movement by installing a new flashboard riser system, control of invasive vegetation, and application of prescribed fire will improve use patterns by both migratory waterfowl and shorebirds, and restore the function and vegetative composition of the impoundment.

Table 2.1 shows animal species found on Onslow Beach (From: BA).

Table 2.1 Amimal species on Onslow Beach

Reptiles	
Northern black racer	*Coluber constrictor*
black rat snake	*Elaphe obsoleta*
snapping turtle	*Chelydra serpentina*
loggerhead turtle	*Caretta caretta*
green turtle	*Chelonia mydas*
leatherback turtle	*Dermochelys coriacea*
Birds	
brown pelican	*Pelecanus occidentalis*
double-crested cormorant	*Phalacrocorax auritus*
great blue heron	*Ardea herodias*
green heron	Butorides virescens
great egret	*Ardea alba*
snowy egret	*Egretta thula*
Canada goose	*Branta canadensis*
wood duck	*Aix sponsa*
gadwall	*Anas strepera*
American wigeon	*Anas americana*
American black duck	*Anas rubripes*
mallard	*Anas platyrhynchos*
blue-winged teal	*Anas discors*
Northern pin tail	*Anas acuta*
green-winged teal	*Anas crecca*
canvasback	*Aythya valisineria*
redhead	*Aythya americana*
ring-necked duck	*Aythya collaris*
greater scaup	*Aythya marila*
lesser scaup	*Aythya affinis*
bufflehead	*Buchephala albeola*
hooded merganser	*Lophodytes cucullatus*
common merganser	*Mergus merganser*
red-breasted merganser	*Mergus serrator*
ruddy duck	*Oxyura jamaicensus*
osprey	*Pandion haliaetus*
red-shouldered hawk	*Buteo lineatus*
northern harrier	Circus cyaneus
merlin	Falco culumbarius
killdeer	*Charadrius*

	vociferous
American oystercatcher	*Haematopus palliatus*
willet	*Cataoptrophorus semipalmatus*
laughing gull	*Larus atricilla*
ring-billed gull	*Larus delawarensis*
herring gull	*Larus argentatus*
common tern	*Sterna hirundo*
least tern	*Sterna antillarum*
black skimmer	*Rynchops niger*
mourning dove	*Zenaida macroura*
Chuck-will's-widow	*Caprimulgus carolinensis*
common nighthawk	*Chordeiles minor*
great-crested flycatcher	*Myiarchus crinitus*
barn swallow	*Hirundo rustica*
tree swallow	*Tachycineta bicolor*
white-eyed vireo	*Vireo griseus*
blue jay	*Cyanocitta cristata*
American crow	*Corvus brachyrhyncos*
fish crow	*Corvus ossifragus*
Carolina wren	*Thyrothorus ludovicianus*
marsh wren	*Cistothorus palustris*
sedge wren	*Cistothorus platensis*
blue-gray gnatcatcher	*Polioptila caerulea*
Carolina chickadee	*Poecile carolinensis*
tufted titmouse	*Baeolophus bicolor*
eastern bluebird	*Sialia sialis*
American robin	*Turdus migratorius*
gray catbird	*Dumetella carolinensis*
Northern mockingbird	*Mimus polyglottos*
pine warbler	*Dendroica pinus*
prarie warbler	*Dendroica discolor*
palm warbler	*Dendroica palmatum*
Yellow-rumped warbler	*Dendroica coronata*
prothonotary warbler	*Protonotaria citrea*
common yellowthroat	*Geothlypis trichas*
orange-crowned warbler	*Vermivora celata*
yellow-breasted chat	*Icteria virens*
summer tanager	*Piranga rubra*
chipping sparrow	*Spizella passerina*
song sparrow	*Melospiza melodia*
Northern cardinal	*Cardinalis cardinalis*
blue grosbeak	*Guiraca caerulea*
indigo bunting	*Passerina cyanea*
painted bunting	*Passerina ciris*
red-winged blackbird	*Agelaius phoneiceus*
boat-tailed grackle	*Quiscalus major*
brown-headed cowbird	*Molothrus ater*
rufus-sided towhee	*Pipilo erythrophthalmus*
seaside sparrow	*Ammodramus maritimus*
Nelson's sharp-tailed sparrow	*Ammodramus nelsoni*
saltmarsh sharp-tailed sparrow	*Ammodramus caudacutus*
savannah sparrow	*Passerculus sandwichensis*
swamp sparrow	*Melospiza georgiana*
Mammals	
oppossum	*Didelphis virginiana*
gray fox	*Urocyon cinereoargenteus*
raccoon	*Procyon lotor*
white-tailed deer	*Odocoileus virginianus*

Least tern, common tern, gull-billed tern, roseate tern, black skimmer, little blue heron, tricolored heron, snowy egret, yellow-crowned night heron, glossy ibis, saltmarsh sharp-tailed sparrow, Nelson's sharp-tailed sparrow, painted bunting, sedge wren, sanderling, red knot, piping plover, Wilson's plover and American oystercatcher are priority bird populations on beach and barrier island habitats within the South Atlantic Coastal Plain as identified by Partners in Flight (2001).

2.2.3 Protected Species

Four federally protected species utilize the Onslow Beach area: seabeach amaranth (*Amaranthus pumilus*), loggerhead and green sea turtles (*Caretta caretta* and *Chelonia mydas*), and piping plover (*Charadrius melodus*). Life history, status and trends for each species are summarized below. Full information on each species is available in the U.S. Fish and Wildlife Service's biological opinion (BO) on the Effects of Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach, Marine Corps Base, Camp Lejeune.

2.2.3.1 Seabeach amaranth

Seabeach amaranth is an annual plant that grows on Atlantic barrier islands and ocean beaches. It grows primarily in disturbed areas such as overwash flats, accreting areas near inlets, and on lower foredunes and upper strands of non-eroding beaches. Seabeach amaranth may serve as a dune-building pioneer species.

The length of seabeach amaranth's reproductive season (see text box below) is strongly affected by weather events such as rainfall, hurricanes, and temperature extremes, and predation by webworms.

The plant has fleshy, pink-red or reddish stems with small rounded leaves that are 0.5 to 1.0 inches in diameter (Figure 2.9). The leaves are clustered toward the tip of the stem, are normally a spinach-green color, and have a small notch at the rounded tip. Flowers and fruits are relatively inconspicuous and are borne in clusters around the stem.

Three reliable populations of seabeach amaranth occur on Onslow Beach (Figure 2.10).

Today, USFWS identifies the most serious threats to this species as:

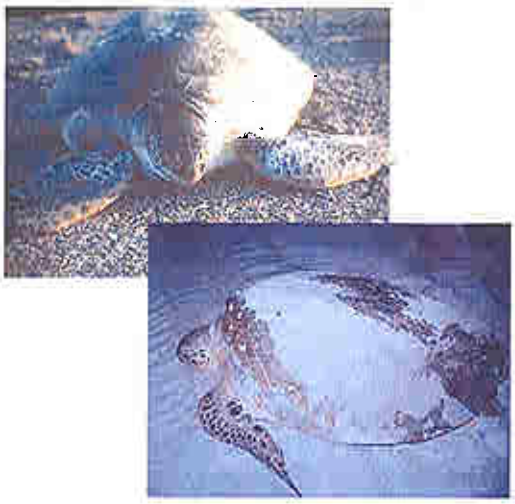
- construction of beach dune stabilization structures
- natural and man-induced beach erosion and tidal inundation
- fungi (white wilt)
- beach grooming
- hebivory by insects and feral animals
- off-road vehicles

Seabeach amaranth
Status in NC: Threatened
Germination: April-July
Flowers: June/July through death of plant
Seed: July/August through death of plant

Figure 2.9 Seabeach amaranth produces dense clumps of 5 to 20 branches and grows to be about one foot in diameter. Clumps of 100 branches or more can be as large as one yard in diameter.

Figure 2.10 Reliable populations of seabeach amaranth occur at New River Inlet, the washover flat, and Onslow North Tower.

Figure 2.11 (Loggerhead and green sea turtles) Adult loggerheads (left) average 3 feet in length, and weigh an average of 250 pounds. Adult green sea turtles are slightly longer and average 350 pounds.



2.2.3.2 Sea turtles

Sea turtles come ashore every year from May to August to lay eggs. Both loggerhead and green sea turtles come ashore at Onslow Beach to nest each year (Figure 2.11). Average nesting density at Onslow Beach is 5.6 nests/mile. Although there has not been a documented leatherback turtle nest on Onslow Beach, there is the chance that leatherbacks, federally listed as endangered, may use Onslow Beach in the future.

Green sea turtles
Status in NC: Threatened
Average clutches: 3/year with 136 eggs/clutch
Incubation: 50-70 days

Loggerhead sea turtles
Status in NC: Threatened
Average clutches: 4/year with 100-126 eggs/clutch
Incubation: 50-70 days

Sea turtles are listed for many reasons, including:

- nest destruction by natural events (hurricanes, tidal surges)
- predation by raccoons, ghost-crabs, and other animals
- human activity (including coastal development, artificial lighting, beach driving, and marine pollution and debris)

Base Order 11015.7C regulates sea turtle management aboard Camp Lejeune. Full monitoring protocols are described in Appendix D.

2.2.3.3 Piping plover

Piping plover (Figure 2.13) is a concern on Onslow Beach because it has been utilizing the beach habitat. Although piping plovers can be seen on Onslow Beach during every month of the year, they are most commonly seen during the spring and fall migration, and during the

winter. No nests have been documented on Onslow Beach.

Piping plover
Status in NC: Threatened
Birds occupy breeding grounds from late March or April through mid-Septemeber
Average nest contains 4 eggs which hatch in about 25 days

Figure 2.12 Piping plover (source: US Army)

USFWS identifies several factors are contributing to the decline of the piping plover along the Atlantic Coast, including:

- Habitat loss due to development along Atlantic beaches
- Nest disturbance by humans and pets
- Increased predation

Bi-weekly shorebird surveys are conducted along Onslow Beach for most of the year. Surveys become more frequent in April, as nesting behavior begins. In addition, Camp Lejeune participates in international piping plover census counts both over winter and in the breeding season.

The best potential piping plover nesting habitat will be posted by April 1st. If piping plovers are spotted during the nesting season, they will be observed for signs of breeding behavior. If breeding behavior is detected or a nest is located outside of the military training portion of the beach, appropriate protective measures will be implemented: the areas will be posted to prohibit disturbance, including pedestrians and pets. Given the essential nature of the military training portion of the beach and the generally low likelihood that piping plover would use that portion of the beach, Camp Lejeune will pursue an incidental take statement for piping plover impacts in the military portion of the beach.

The USFWS published a revised recovery plan for piping plover in 1995.

2.2.4 State listed/protected Species

North Carolina threatened and endangered species lists include the four federally listed species as well as the gull-billed tern (*Sterna nilotica*, NC-Threatened). Several North Carolina Species of Special Concern use Onslow Beach, including the Carolina diamondback terrapin, black skimmer, common tern, glossy ibis, snowy egret, tri-colored heron, and little blue heron. Wilson's plover, a species listed as significantly rare in North Carolina nests on Onslow Beach.

2.2.5 Cultural Resources

Cultural resources will not be affected by changes proposed in this document.

2.3 Human Environment

2.3.1 Socio-Economic

As a strategic plan, this document has no socio-economic effects on MCB Camp Lejeune or Onslow County, NC. Socio-economic impacts of any projects that result from this plan will be fully considered in future documents.

2.3.2 Recreational Facilities

MCCS maintains 74 beach rental units, including 3 field grade houses, 15 trailers with two or more bedrooms, and 56 one-bedroom lodges. A gazebo, "seashells" (family-sized pavilions), and pavilions are available for day use activities. Riseley Pier offers a snack bar, fishing pole rental, and a bait and tackle shop. Chapter 3, Current Use, describes recreational activities at Onslow Beach.

2.3.3 Infrastructure and Utilities

2.3.3.1 Potable Water

Water usage averages about 50,000 gallons per day. The current capacity of the waste treatment plant is 250,000/day.

2.3.3.2 Wastewater

Wastewater capacity on the beach is limited by the capacity of the pumps locations in the lift station. Using a design figure of 100 gallons/person/day, station can manage >1,500/day. Current flow is managed with one pump. With three pumps operating, the sewerage pump station on the beach can handle 1,050 gallons/minute.

2.3.3.3 Electricity

Onslow Beach is served by a 600-amp line, which operates at 65% capacity.

2.3.4 Roads

There is one main access road to Onslow Beach.

Chapter 3 Continuing Uses

Onslow Beach is currently used for recreation, training, and environmental conservation. Figure 3.1 shows current use patterns on the beach.

3.1 Military Training

A significant amount of training occurs on Onslow Beach (Figure 3.2). Training occurs primarily between Riseley Pier and the South Tower. All areas north of the North Tower are off limits to non-military personnel because it is a live fire range and impact area (Figure 3.3).

Figure 3.2 Onslow Beach is one of only two areas nationwide for large-scale amphibious training. Exercises range from recon battalion training to full-scale Joint Task Force Exercise.

Figure 3.1 Current Use Patterns on Onslow Beach

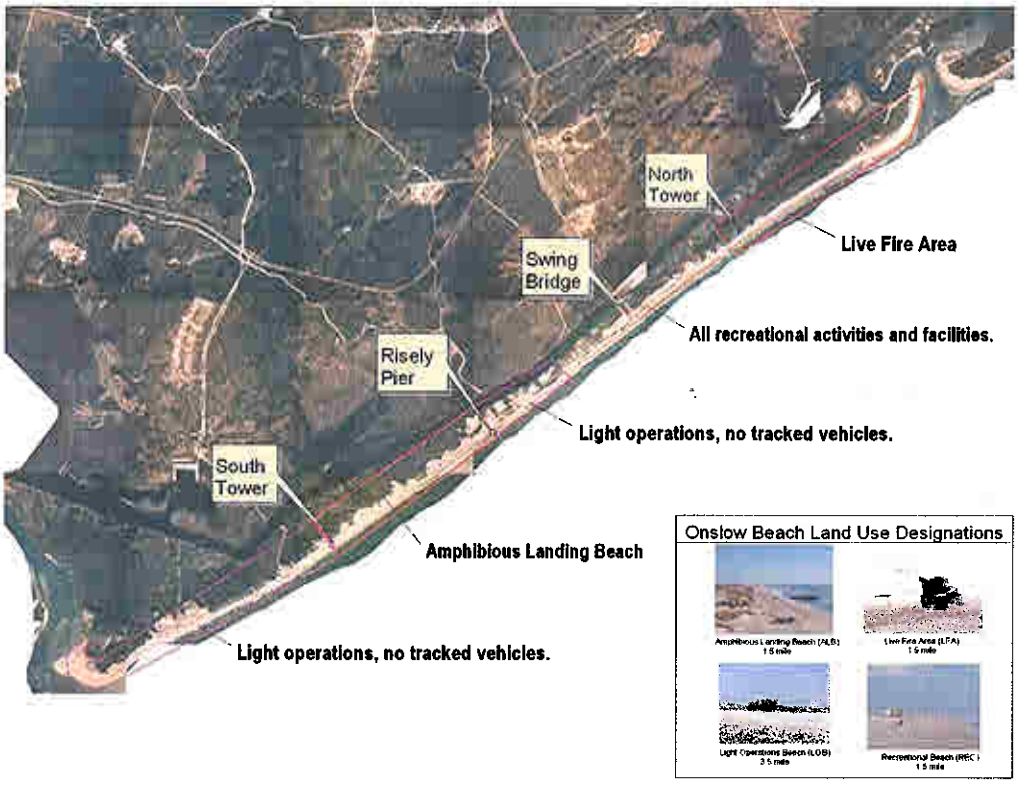


Figure 3.3 Training areas on Onslow Beach

3.1.1 Training Area E

In 2002, the E training area was scheduled 558 times by various units. Since more than one unit can use the beach simultaneously, the scheduling number cannot be translated precisely into the number of days the training area was used. However, Range Control estimates that the E training area is routinely used for military training more than 240 days every year. The E-1 range was scheduled 51 days. Table 3.1 reflects typical training events on Onslow Beach.

Most typical training on Onslow Beach represents one component of ship to shore movement of an amphibious force. Depending upon the scale of the exercise, varying numbers of Amphibious Assault Vehicles (AAV), Landing Craft Air Cushions (LCAC), and Landing Craft Utility (LCU) boats transfer personnel and equipment from amphibious assault ships to Onslow Beach.

Tactical vehicles including Highly Mobile Wheeled Vehicles (HMWV), 7-ton trucks, M-1 Abrams tanks, and Light Armored Vehicles (LAV), are offloaded from the amphibious landing craft and move off the beach. The personnel and equipment move inland by way of either the hard-paved road / bridge, or by crossing the AIWW in amphibious vehicles.

The reverse of this characterizes onload operations with the addition of staging areas where equipment and personnel are consolidated until embarkation.

Smaller scale training includes diving operations, small craft operations, driving school for large transport vehicles, communications exercises, reverse osmosis water purification (ROWPU) exercises, and the newer tactical water purification system training exercises (TWPS)..

Table 3.1 Training events aboard Onslow Beach

EXERCISE	FREQUENCY	DURATION	EQUIPMENT
CAPEX *(Capabilities Exercise)*	4/year	5 days	2 LCAC/ 10-12 AAVS
ESGMINT *(Expeditionary Strike Group MEU Integration)*	3/year	8 days	200 vehicles/ 12 AAVs/ 3 LCACs/ 2 LCU
ESGEX *(Expeditionary Strike Group Exercise)*	3/year	9 days	Zodiac boats /200 vehicles/ 3 LCACs/ 2 LCUs
CERTEX *(Certification Exercise)*	3/year	7 days	Zodiac boats /200 vehicles/ 3 LCACs/ 2 LCUs
MEU on-load (Marine Expeditionary Unit)	3/year	2 days	100 vehicles/ 3 LCACs / 2 LCUs
MEU off-load	3/year	2 days	100 vehicles/ 3 LCACs / 2 LCUs
TCAT *(Type Commanders Amphibious Training)*	3/year	6 days	200 vehicles/ 3 LCACs/ 2 LCU
UNITAS preparation			Compilation of equipment/vehicles as described in MEUEX, SOCEX,on/off-loads
Amphibious Assault Vehicles Bn Training	90 days /year	daily use	10-12 AAVs
RECON BN/ SOTG/ Joint Armed Services training	300 days/year	daily use	zodiac boats, personnel
JTFEX *(Joint Task Force Exercise)*	3-6/year	7-9 days	Compilation of equipment/vehicles as described in MEUEX, SOCEX,on/off-Loads
Live fire over AIWW onto Browns Island/ E-1 Stinger Fire Exercise	~ 10 / year	2-3 days (+2 days)	6 HMMWVS, target drones,1-2 5-ton trucks.

3.1.2 N1/BT3 Impact Area

The N-1/BT-3 impact area extends from mainland Camp Lejeune seaward nearly 14 km. The area receives impacts from direct fire at fixed targets from the G-5, G-6, and G-7 ranges. Artillery, as well as LAV's and AAV's with mounted 50-caliber machine guns utilize these ranges. Targetry on Brown's Island along the AIWW is fired upon by small arms associated with riverine small craft training.

In 2002, the N-1/BT-3 impact area was hot on 28 occasions. Each time the impact area is scheduled, a Notice to Mariners is disseminated and the area is swept for commercial and recreational watercraft.

3.2 Recreation

Recreational opportunities on Onslow Beach are characterized as either Commercial or Outdoor recreational activities. Commercial and Outdoor recreational activities occurring in the recreational portion of Onslow Beach are managed by Marine Corps Community Services (MCCS). Other Outdoor recreational activities such as hunting, fishing, and ORRV use that occur outside the recreational beach are managed by the Environmental Conservation Branch (ECON), Environmental Management Division (EMD), Installations and Environment (I&E) Department. The Conservation Law Enforcement Office (CLEO), of ECON\EMD\I&E provides enforcement

of regulations that involve outdoor activities.

3.2.1 Commercial Recreation

MCCS managed recreational activities are available to all active duty and retired military personnel and their families, and to authorized civilians.

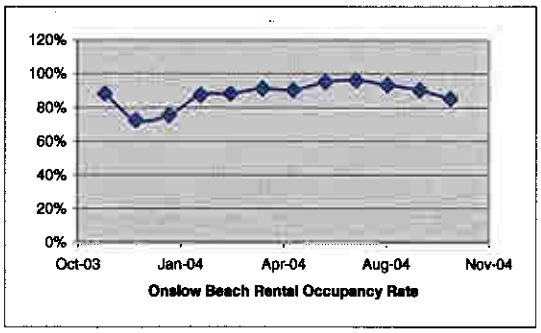
3.2.1.1 Beach Lodging and Facilities

MCCS maintains 74 beach rental units, including 3 field grade houses, 15 trailers with two or more bedrooms, and 56 one-bedroom lodges (Figure 3.4).

Figure 3.4 (enlisted lodges) Three, four, and seven-night lodging packages are available year round through MCCS.

Occupancy rates are steady at near 100% May through September each year, and drop off to 70% in the off-season (Figure 3.5).

Figure 3.5. shows beach rental occupancy rates.



MCCS also maintains a campground with 26 RV and 15 tent sites (Figure 3.6). Each site has water, electric, and sewage hook up. Laundry facilities are also available. Occupancy rates for the campground are highest in June and July when they approach 100%.

Figure 3.6 Camping is a popular activity at Onslow Beach.

3.2.1.2 Swimming

Guarded swimming areas are available May to September. Sunbathers and swimmers generally utilize the recreational beach where showers and other facilities are available. (MCCS started collecting demographics in January. Although beach user demographics are not available, MCCS estimates that 70% of beach users at Onslow Beach are active duty enlisted (under 30), 20% active duty Staff NCO/Officers, and 10% civilian or retired.

To support swimming and other day-use activities, three types of structures are available for rent for day use: the gazebo, "seashells" (Figure 3.7), and pavilions

Figure 3.7 Shelters, such as the seashells above, are available for rent on a daily basis.

The gazebo is a large, covered area with a cement floor, picnic tables, electric hook up and water. Seashells are smaller units with a picnic table, dressing room and shower. Use is limited to 10 persons. The pavilions are designed for up to 30 persons and include restrooms, showers, and vending areas. SNCO and Officer's pavilions have conference rooms available for rent year round.

MCCS also maintains the "Sand Trap" miniature golf course and Riseley Pier. Both are open year round. Riseley Pier has a bait and tackle shop, fishing pole rental, and snack bar. The area around Riseley Pier is a popular place for beach recreation. A small shop offers refreshments, fishing gear, and other various sundries to the recreational users.

3.2.2 Outdoor Recreation

3.2.2.1 Off-Road Recreational Driving

The off-road recreational vehicle (ORRV) program regulated by base order (BO) 11017.1 has gone through a number of changes in the past several years. The ORRV program was opened to a larger segment of the public in 1999. Prior to that time, only vehicles used to transport surf fishers were permitted. With the adoption of BO 11017.1D, ORRV access was offered to any DoD registered vehicle once a beach-driving permit had been obtained. In 2002, ORRV permits were issued to 1,206 drivers.

In addition to authorizing a larger user base, (BO) 11017.1D regulated ORRV use on Camp Lejeune. The BO defined two types of ORRVs: registered and non-registered. Registered ORRVs are vehicles that meet North Carolina state requirements for operation on paved roads. They must have a current DoD sticker. Non-registered ORRVs, which are prohibited aboard Camp Lejeune, cannot be registered by the state for use on paved roads. Dirt bikes and all-terrain vehicles are examples of non-registered vehicles.

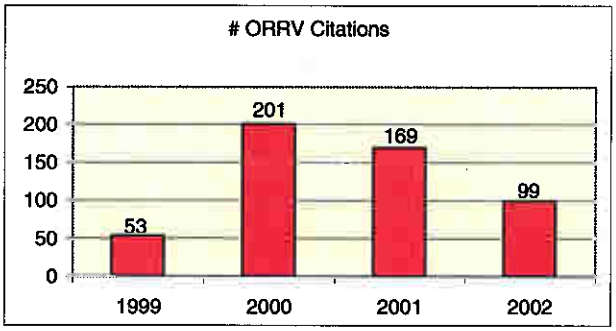
All ORRV use on Onslow Beach requires a beach permit, obtainable through the Conservation Law Enforcement Office. The following is a summary of rules outlined in the 1999 base order:

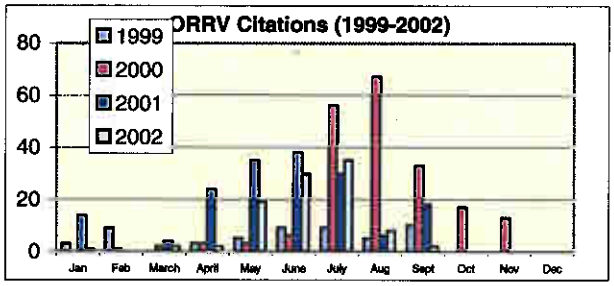
- No ORRVs are ever authorized north of Riseley Pier
- ORRVs are authorized from the pier to the inlet
- There are only 2 access points to the strand: at the pier and at South Tower
- ORRVs are authorized between the pier and the South Tower as long as military training is not interfered with or interrupted
- ORRVs must remain seaward of the posts painted orange

- Driving on dune vegetation is prohibited
- ORRVs are not to disturb sand fences or the areas that they protect
- Travel on the strand is restricted to daylight hours from 15 May through 31 October
- Sites may be posted to restrict traffic to protect endangered species, nesting shorebirds, or other environmental projects. Instructions on these signs must be followed
- Use of glass containers on the beach is prohibited

Since 1999, 522 warnings/tickets have been issued to ORRV drivers. Most of these warnings/tickets were for not having a permit. Table 3.2 shows the distribution of ORRV citations throughout the year, for the years 1999-2002.

Table 3.2 ORRV Citations, 1999-2002.

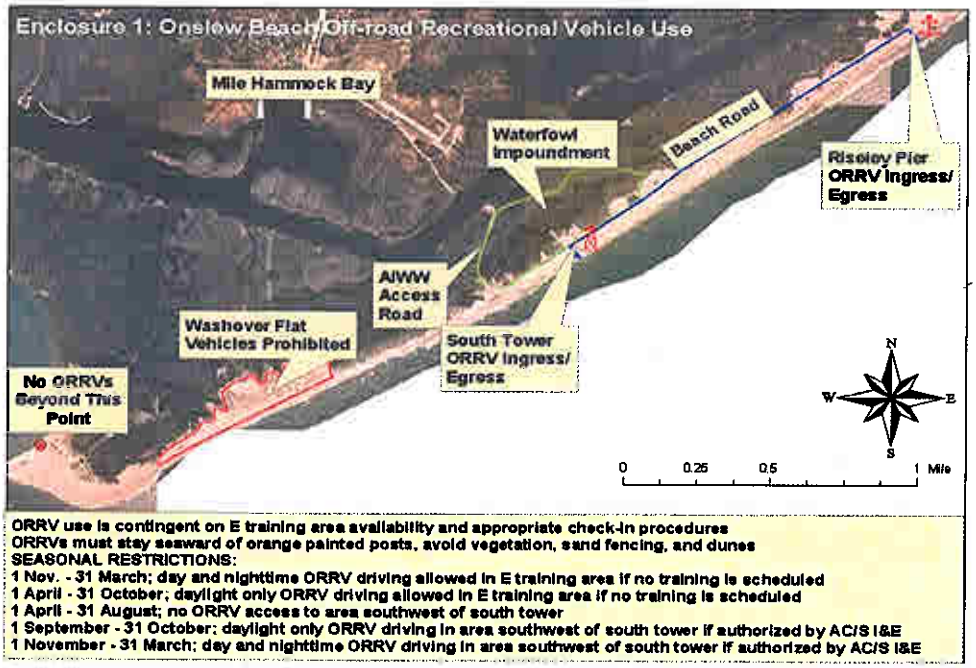




ORRV use on Onslow Beach is a particularly important environmental issue because of the fragile nature of the ecosystem and use of the beach by species of special concern.

The most recent revision to BO 11017.1 came in March 2005. BO 11017.1F includes greater restrictions on ORRV use of Onslow Beach during the nesting season for sea turtles and shore birds (Figure 3.8). Greater protection of these species is seen as essential to the Marine Corps' continued use of Onslow Beach. New restrictions include a prohibition on beach driving south of Onslow South Tower between 1 April and 31 August. During this period, beach driving will be allowed in the amphibious training beach when no training is scheduled. Drivers will be required to sign in and out of the area, and the Environmental Management Division will have the authority to set a maximum on the number of drivers on the beach at one time.

Figure 3.8 reflects new ORRV restrictions set forth in BO 11017.1F, finalized in March 2005.



3.2.2.2 Hunting

Various hunting opportunities are available in training area E. Hunters aboard the base must comply with all North Carolina state laws and regulations as well as Base Order 5090.11S, Hunting, Fishing, and Trapping Regulations. The Range Control Office posts areas available for hunting on a daily basis throughout the hunting season.

Deer season, bow only, is open 7 September through December. Table 3.3 illustrates hunter usage/availability data within the Echo training area for the 2002 hunting season. Training areas are available for hunting when no military training or other activities are scheduled. There were 114 potential hunting days during the season if the area was open continuously. The E training area was scheduled for military training 64 days and available for hunting 50 days. Hunters logged 19 days of actual use (38% usage). Quality Deer Management (QDM) has been implemented.

The selection of Quality Deer Management (QDM) areas on Camp Lejeune was based upon various factors such as recreational access, deer density, soil type, distribution of existing wildlife clearings, and past harvest data. Hunting Area 2 was selected due to the spatial arrangement of forest types, soils, and recreational use patterns. The habitats present within the area are characteristic of various forest management strategies that provide for comparative analyses between areas to assess how habitat management in combination with different harvest strategies affects deer population response.

The goal of QDM at Camp Lejeune is to provide the means, through habitat improvements and harvest regulation, for the resident deer herd to express its highest native biological potential. QDM at Camp Lejeune is not intended to be trophy management.

Waterfowl hunting is more sporadic, with several split seasons opening in September and closing in January. The most commonly hunted waterfowl include, green-winged teal, blue-winged teal, lesser scaup, gadwall, mallard, black, ringneck, and pintail ducks.

Table 3.3 2002 Hunter usage/availability of E training area (number of days)

	September	October	November	December	Totals
Training	14	24	15	10	64[1]
Available	8	7	14	21	50
Days Hunted	5	0	6	8	19[2]
*Deer	36%	-	45%	49%	43.3%
*Waterfowl	64%	-	55%	51%	56.7%

[1] Days when E training area was scheduled for military training.
[2] Days hunter usage was logged.

3.3 Environmental Conservation

3.3.1 Erosion Control

MCB Camp Lejeune works to identify and correct erosion and sedimentation problems aboard Camp Lejeune.

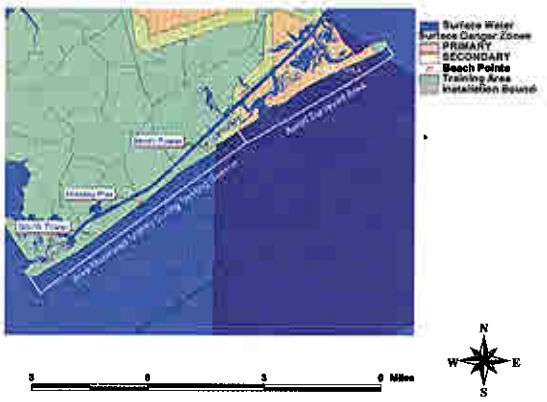
The Environmental Conservation Branch implements dune restoration and stabilization projects to promote continued sand accumulation along the beach and to discourage illegal dune crossings. Activities include sandfencing and planting beachgrass on the training area of the beach. Camp Lejeune has no plans to nourish Onslow Beach.

3.3.2 Sea Turtle Program

Environmental Conservation Branch has monitored sea turtle nesting on Onslow Beach since 1979. Figure 3.9 shows sea turtle monitoring areas on the beach.

Technicians and volunteers conduct nightly surveys from mid-May through August to document the location and number of sea turtle crawls, and record individual tagging and size data. All nests found in the training area of the beach are relocated within six hours of egg laying. Nests laid below the mean high tide line may also be relocated.

Figure 3.9 Approximately 11 miles of Onslow Beach are monitored for sea turtle nesting each year.



In addition to the nightly surveys described above, aerial surveys are conducted twice a week from mid-May through August to assess sea turtle nesting in the N-1/BT-3 Impact Area.

Onslow Beach is an index nesting site for the state of North Carolina. As such, all data collected is reported to the appropriate state and federal agencies.

3.3.3 Shorebird and Colonial Waterbird Program

Since 2000, the ECON branch has been monitoring the use of Onslow Beach by a variety of colonial waterbirds and shorebirds. During the non-breeding season (August-March), surveys of the entire beachfront are conducted bi-

weekly. From April through July, surveys are conducted weekly to document and monitor nesting effort. Piping plover have been recorded foraging on Onslow Beach, though no nesting has been documented.

Colonies of least terns regularly nests on the southern portion of the beach, specifically at New River Inlet, a large overwash area just north of the southern end of the island, and an open area near Onslow South Tower. Nesting Wilson's plovers are commonly found in the inlet and overwash areas.

By April 1 of each year, least tern and shorebird nesting areas are posted with posts and engineer tape (highly visible white cloth tape approximately 2" wide). Signs will be posted to prohibit vehicular access and to discourage disturbance by pedestrians and pets. Dogs on Onslow Beach must be leashed at all times. This and other rules are enforced by Conservation Law Enforcement Officers who patrol the beach on a regular basis.

3.3.4 Painted Bunting Study

The eastern population of painted buntings is considered a species at risk in the Southeastern United States. Painted buntings rely on early successional maritime scrub-shrub or scrub live oak habitat for breeding. Population declines are primarily attributed to degradation of these habitats throughout the southeast.

Camp Lejeune has been involved in a study to determine annual survival by age and sex since 1999. Feeding stations are maintained throughout the spring and summer and are regularly monitored to record the numbers and sexes of visiting birds. In July of each year of study participation, birds are captured and marked with unique color bands on each leg. Two feeding and capture stations are currently maintained.

3.3.5 Marine Mammals

Six federally-protected marine mammal species inhabit Onslow Bay seasonally: fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), northern right whale (*Balaena glacialis*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter catodon*). The northern right whale is the most frequently encountered.

In order to protect these mammals, aerial surveys are conducted before every live fire exercise in the N-1/B-3 Impact Area. If whales are spotted, the exercise is postponed until the animals have left the area.

In addition to training restrictions, Camp Lejeune participates in the marine mammal stranding network, a volunteer service that reports and documents strandings in coastal states. The program was established by a 1992 amendment to the Marine Mammal Protection Act and is administered by the National Marine Fisheries Service. Stranding events are infrequent with two or less occurring annually.

3.3.6 Training Related Conservation Efforts

For 25 years, MCB Camp Lejeune has implemented certain training considerations on Onslow Beach. For example, the following actions protect sea turtle nesting habitat while aiming to prevent harm to individuals.

- Minimizing nighttime landings or assaults and artificial nighttime lighting
- Traveling the beach below the mean high tide line
- Establishing beachmaster camps and bivouac sites behind the primary dune
- Using marked ingress/egress points
- Avoiding vegetation damage
- Turning off vehicle headlights when sitting idle
- Refrain from excavating tank traps or other large holes.

ECON works closely with the Range Control Division (RCD) as training units request the E Training Area during sea turtle nesting season. Requesting units describe their proposed training operation to ECON personnel who prescribe conservation measures or initiate Section 7 ESA consultation if the proposed action is outside of standing Biological Opinions. The RCD schedules the unit only after the appropriate level of coordination has taken place.

Chapter 4 The Future of Onslow Beach

4.1 Future Uses, Development and Conservation

In order to sustain military readiness and the supporting quality of life initiatives on Onslow Beach, infrastructure and facilities improvements are necessary. Deficiencies in training realism and recreational opportunities must be remedied in a manner that minimizes conflict between the uses while preserving a balance with the dynamic ecosystem of a barrier island.

4.1.1 Supporting Military Readiness

The major grievance of military trainers utilizing Onslow Beach is that surrounding the frequency of and complications due to administrative pauses. Three factors are responsible for these pauses:

- Recreational activities occurring in the training beach concurrent with military exercises
- Obstacles presented by recreational facilities, vehicular, and pedestrian traffic along the single roadway leading to the training beach
- Frequency requirement for the opening of the swing bridge crossing the Atlantic Intracoastal Waterway (AIWW) and closures associated with live fire training

Marine units accessing the primary training beach are forced to contend with a bottleneck of vehicular and pedestrian traffic moving from inland areas, crossing the (AIWW) and traveling southward to Riseley Pier. The primary training beach is described as the portion of the E training area from Riseley Pier southwest to Onslow South Tower.

The majority of tactical vehicles cross the AIWW via the swing bridge on Onslow Beach Road. The bridge opens to allow passage of boats every half hour based on boat traffic. These frequent openings result in traffic back-ups that can delay training operations and concentrate privately owned and tactical vehicles on a single roadway.

Once on the island, convoys of military vehicles weave through 1.5 miles of vehicular and pedestrian traffic associated with the recreational portion of Onslow Beach. The congestion associated with the recreational beach further slows training operations while creating dangerous conditions for pedestrians.

Riseley Pier is a focal point of recreational activities including fishing, surfing, sunbathing, beachcombing, and an access point for off-road recreational driving (ORRV). In addition to four-wheel drive privately owned vehicles transiting through or stopping in the training beach, the overflow of people from Riseley Pier falls into the training beach. This situation creates administrative pauses as the training

units mitigate safety hazards posed to the beach-goers and their Marines.

While conflicts with recreational utilization of Onslow Beach must be resolved to sustain the training mission, changes in mission requirements must also be addressed and accommodated. Reasonably foreseeable changes to the military mission on Onslow Beach include:

- Fleet acquisition of new equipment such as the Expeditionary Fighting Vehicle (EFV), the Assault Breacher Vehicle (ABV), the Landing Craft Utility 2000 (LCU 2000), and the Enhanced Landing Craft Air-Cushioned (E-LCAC)
- Increased joint service use of Onslow Beach, including Army, Coast Guard, and international units
- Increased utilization of the E-1 range for live fire exercises into the N-1/BT-3 Impact Area

Whereas the environmental effects of new equipment will be evaluated through the National Environmental Policy Act (NEPA) process, steps should be taken to ensure a smooth integration of the equipment into ongoing beach operations and uses.

Camp Lejeune Marines are generally familiar with the layout, obstacles, constraints, and activities found on Onslow Beach. As more visiting units utilize the beach for training, efforts must be made to familiarize them so that hazards can be mitigated and natural resources conserved.

Increased utilization of the E-1 range has the potential to change recreational usage patterns and natural resource management on the northern stretch of Onslow Beach. The provisioning of basic facilities to accommodate range use could offset potential impacts to natural resources while providing a secure base of operations for training units.

The culmination of these existing and projected conditions provides a basis for setting long-term goals supporting mission sustainability.

Training Mission Statement

To provide Beach Training Area and facilities for the long-term viability of safe and efficient conduct of platoon to brigade scale expeditionary and amphibious operations and training.

Mission Supporting Elements

There are four mission-supporting elements at Camp Lejeune:

1. Safe and effective current operations
2. Safe and effective future operations
3. Multiple scales of operation
4. Training Area sustainability

4.1.1.3 Supporting Goals and Objectives

1. Safe and effective current operations
   a) Minimize encroachment from recreational uses
   b) Designate mutually exclusive training and recreational areas
   c) Erect a fence/gate complex that physically restricts access to training area.
   d) Relocate or construct a new pier facility to draw recreational uses away from the training beach.

e) Provide alternative means for tactical vehicles to access the training beach, e.g. bridge or bridging, access road.
f) Implementation of Camp Lejeune Integrated Observation Network (CLION) to provide current tidal and climatic conditions to operating units.
g) Secure additional restricted airspace for Naval Gunfire and Stinger Missile exercises into and over the N1/BT3 Impact Area.

2. Safe and effective future operations
   a) Prevent encroachment from recreational uses
   b) Ensure that commercial recreational development on Onslow Beach or IAWW shoreline does not reduce accessibility to or utilization of training areas or resources.
   c) Ensure that commercial recreational activities do not interfere with training operations.
   d) Coordinate new operations and/or fielding of new equipment with appropriate regulatory agencies.

3. Multiple scales of operation
   a) Provide for expanded amphibious landing area when large-scale exercises warrant and conservation measures have been approved.
   b) Create additional amphibious splash points along the Atlantic Intracoastal Waterway (AIWW) to facilitate large inland movements.
   c) Re-evaluate and modify if necessary the procedures and guidance for closures of the AIWW.
   d) Explore potential amphibious landing areas outside of Camp Lejeune but within the local area.
4. Fielding new equipment
   a) Expeditionary Fighting Vehicle (EFV)
      i) Initiate NEPA process for establishment of a waterborne live fire range from near-shore to the N-1/BT-3 Impact Area.
      ii) Evaluate training area resources for testing phase of EFV.
      iii) Integrate potential construction of a recreational pier for utilization in EFV testing and fielding.
   b) Enhanced Landing Craft Air Cushion (LCAC)
      i) Evaluate training area resources for use by E-LCAC.
      ii) Initiate NEPA process for use of beach area by E-LCAC
   c) Landing Craft Utility (LCU) 2000
      i) Evaluate training area resources for use by LCU 2000.
      ii) Initiate NEPA process for use of beach area by LCU 2000.

5. Training Area sustainability
   a) Beach Erosion
      i) Maintain posting at ingress/egress points.
      ii) Disseminate and enforce Range Control SOP's as they relate to training on Onslow Beach.
      iii) Provide year-round SOP enforcement on Onslow Beach.
   b) Conservation

i) Coordinate atypical training exercises with ECON Branch.
ii) Enhance conservation value of the southern portion of Onslow Beach by placing applying a conservation area designation.

c) Encroachment
i) Monitor and adjust recreational impacts on training area.
ii) Maintain compliance with applicable environmental laws through coordination with the Environmental Management Division.

4.1.2 Supporting Quality of Life Recreational Opportunities

Currently, the primary users of MCCS facilities on Onslow Beach are active duty Marines under the age of thirty. Sunbathing, swimming, fishing, and surfing are common activities while staying at the lodging available on the beach. With 74 rental units available, utilization rates are high throughout the year. This indicates that demand for rental lodging exceeds supply.

Similarly, other components of recreation such as dining, retail conveniences and entertainment are in demand by the younger clientele. Thus, the existing facilities may not meet the expectations of MCCS customers.

Further, it is anticipated that the number of authorized users of Onslow Beach will increase as a result of:

- Base Realignments and Closures shifting military units to Camp Lejeune
- An increasing retired military population in eastern North Carolina
- An increasing number and size of joint training exercises

The deficiency in existing recreational offerings and the anticipation of a larger user group contribute to the MCCS Mission State for Onslow Beach Operations.

4.1.2.1 Recreation Mission Statement

To provide an aesthetically pleasing, relaxing, and pleasurable environment through recreational activities and services that facilitates family cohesion and individual morale.

4.1.2.2 Mission Supporting Elements

1. Aesthetically pleasing and relaxing setting
2. Enjoyable commercial recreational activities and opportunities
3. Convenient services and support
4. Lodging accommodations for singles to multi-member families.

4.1.2.3 Supporting Goals and Objectives

1. Aesthetics and setting
   a) Attractive and consistent signage to include directional and interpretive information.
   b) Native landscaping to improve appearance, provide shade, and stabilize soils.
   c) Vehicle noise minimization
      i) Provide bicycle rentals
      ii) Construct pedestrian/bicycle paths and trails

2. Commercial recreational activities and opportunities
   a) Community center- facility for nighttime entertainment, i.e. arcade, pool hall.
   b) Beach Gear rentals- beach chairs, tents, boogie boards, etc.
   c) Recreational fishing complex- (AIWW shoreline) fishing gear/non-motorized watercraft rentals, boardwalk, pavilion complex/ picnic area.
   d) Full-service restaurant

3. Services and support
   a) Beach complex- reservations, exchange, laundry facilities
   b) Restroom/Shower facility between SNCO and Enlisted pavilions
   c) Additional storage for beach management operations (beneath enlisted pavilion)

4. Accommodations
   a) Demolish beachfront structures and trailers as they degrade beyond reasonable repair.
   b) Construct new lodging in each area of the beach.
      i) Enlisted Beach- up to 50 new units
      ii) SNCO Beach- up to 15 new units
      iii) Officers Beach- up to 8 new 3 units for Senior Officers, up to 6 units for company/field grades.
   c) Create up to 22 new Recreational Vehicle camping sites

4.1.3 Natural Resource Conservation

The current use patterns on Onslow Beach allow for concurrent utilization by protected species, and other native wildlife. While a full one half of the island is impacted by human activities- including training, recreation, and off-road driving, the other half is essentially preserved in a natural state due the restrictive nature of the N-1/BT-3 Impact Area. However, these same restrictions preclude ECON personnel from monitoring or protecting the wildlife resources in the northern half of the island. It can be safely assumed that this portion of the island harbors breeding waterbirds and shorebirds, provides high quality habitat for nesting sea turtles, and the federally listed seabeach amaranth. Since these populations are not monitored or managed, their presence or condition cannot be considered as mitigation for or an offset to impacts resulting from the use of the southern portion of the island.

Thus, southern Onslow Beach should be managed to enhance wildlife values without constraining the primary military training mission. The major concerns regarding wildlife-human interactions are summarized below.

- Effects of artificial lighting on sea turtle nesting and hatching
- Lower sea turtle nesting densities along recreational beach
- Effects of off-road driving and human disturbance on colonial waterbirds and shorebirds
- Availability of suitable nesting habitat for waterbirds and shorebirds
- Conservation of protective qualities of the vegetated dune system

These factors contribute to the development of conservation goals and objectives for Onslow Beach.

4.1.3.1 Conservation Mission

To conserve and protect the natural resources on Onslow Beach in order to sustain the training mission while providing for appropriate recreational utilization of the resources.

4.1.3.2 Mission-Supporting Elements:

1. Mission-supporting conservation actions
2. Habitat enhancement for protected species
3. Maintenance of storm buffer qualities of the barrier island
4. Native species diversity and abundance
5. Consumptive recreation opportunities
6. Non-consumptive recreation opportunities
7. Mission compatible access to nature based recreation
8. Education Outreach - Awareness

4.1.3.3 Conservation Goals

1. Mission Supporting Conservation Actions
   a) Continue to implement existing protective measures through Base Orders and Range Control SOPs.
   b) Coordinate with training units when appropriate to protect sea turtles- provide reasonable measures and alternatives for mission accomplishment.
   c) Ensure appropriate level of enforcement for both training and recreational activities in the designated training area.

2. Protected species habitat enhancement
   a) Sea Turtles
      i) Enhance sea turtle nesting habitat
      ii) Remediate existing lighting problems and ensure all new lighting is consistent with sea turtle conservation
      iii) Protect and stabilize beach vegetation and dune system in areas between Onlsow North and South Towers.
   b) Colonial waterbird / shorebird nesting habitat
      i) Provide early successional beach habitats
      ii) Protect quality habitats from human disturbance where practical
      iii) Control predator abundance in important nesting areas

3. Protect and enhance storm buffer function of the barrier island
   a) Avoid impacts to wetlands
   b) Maintain stable dune system in recreational area

4. Native species diversity and abundance
   a) Control Invasive species in wetlands and prevent establishment in terrestrial systems.
   b) Maintain, enhance, and restore maritime scrub/shrub communities

5. Consumptive Recreation Opportunities

a) Maintain existing level of resource based recreational opportunities
b) Coordinate projected user information with appropriate commands.
c) Construct an interpretive nature trail on the island
d) Enhance spatial and temporal access patterns to the Onslow Beach Waterfowl Impoundment to improve user experience and participant safety.
    i) Create a system of duck blinds under the current zonal system that spatially separates individual hunting parties

6. Non-Consumptive Outdoor Recreation
    a) Enhance non-consumptive opportunities for enjoyment of wildlife and natural resources
        i) Create a system of interpretive wildlife viewing platforms and trails.
        ii) Develop a Watchable Wildlife Guide (Marine and Terrestrial) for Onslow Beach.

7. Mission Compatible Access to Outdoor Recreation
    a) Control access to the southern beach in the same manner as inland training areas.
        i) Access permitted only when training area is not scheduled
    b) Enact Seasonal ORRV prohibitions (mid-March through mid-Sept)

8. Increase conservation outreach activities on Onslow Beach
    a) Provide educational materials to beach goers and military trainers
    b) Develop interpretive signs pointing out significant areas or activities

4.2 Land Use Designations

In order to accomplish mission goals and objectives in the confines of the barrier island, areas of influence or land use designations were defined. The designations are intended to minimize conflicts between the different user groups and to provide a framework against which future projects will be measured for consistency.

Although some level of shared use will occur within and between the delineated areas, the intent is that the identified use takes priority in the decision making process. The four major designations are 1) Live FireTraining, 2) Recreation, 3) Training and 4) Special Use/Access. Figure 4.1 depicts proposed land use designations for Onslow Beach.

Figure 4.1 Proposed land use designations for Onslow Beach

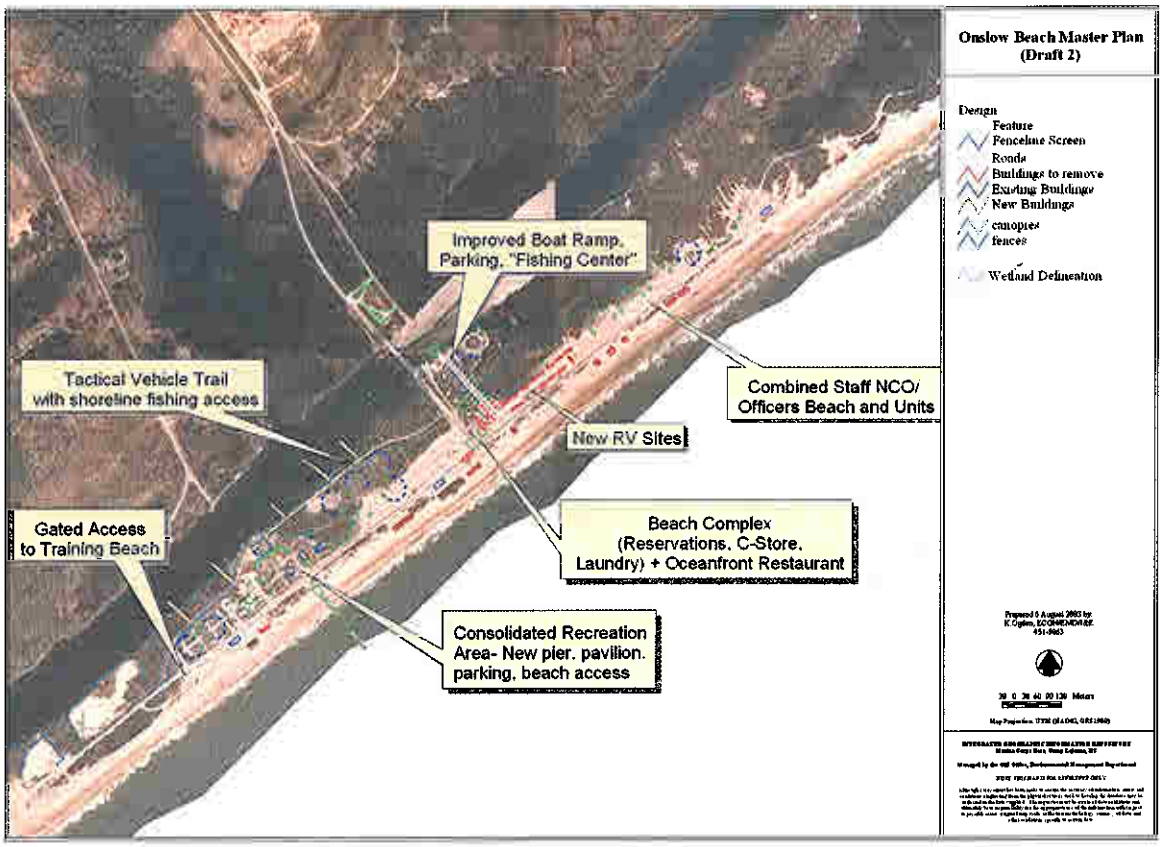
The Live Fire Training portion of the beach stretches from Brown's Island southeast to the Officer's Pavillion. It includes the impact areas of Brown's

Island and northern Onslow Beach as well as the E-1 Range. It is separated from the remainder of Onslow Beach by fencing; a locked gate and warning signs.

The area from the SOTG compound northeast to the Officers' Pavilion is the designated Recreational Beach (Figure 4.2). Existing and future facilities along with the majority of recreational activities will be confined to this stretch of beach. Recreational uses and facilities will stretch from behind the primary dune to the shorelines of the AIWW to maximize recreational opportunities in this area.

The Training portion will include the area between the Special Operations Training Group (SOTG) compound southwest to the splashpoint corridor leading to Landing Zone Bluebird. This portion of beach can be further delineated into the Amphibious Landing Beach (ALB) and the Light Operations Beach (LOB). The differentiation is due to current protocol for the relocation of turtle nests where amphibious landings including tracked vehicle movement threaten nests left in place. Therefore the area from Riseley Pier to Onslow South Tower remains the amphibious landing beach while lighter operations including wheeled tactical vehicles, small boats, or other similar training will take place from Riseley Pier north to the SOTG compound, and from Onslow South Tower to the New River Inlet

Figure 4.2 Proposed land use for the Recreation portion of Onslow Beach



The fourth land use type is for combined Special Use/Access. This designation applies to the area south of Onslow South Tower. This area will accommodate light training activities but the area will also be focal points for natural resource management. This area currently provides habitat and other conditions that are conducive to occupation by rare and endangered species along with an assortment of other native plants and animals.

4.2.1 Implementation Priorities

To segregate recreational activities from training activities and to minimize impacts to natural resources, certain project proposals contained within this plan are critical.

First, the abandonment of Rislely Pier and the construction of a new pier within the recreational portion of the beach will centralize activity while drawing recreational users away from the training beach. Both the Training and Operations Department and Marine Corps Community Services enthusiastically support the construction of a new pier.

Next, to visually delineate the recreational beach from the training beach, fencing and signs would be erected where the hard paved road meets the gravel trail in the vicinity of the SNCO pavilion. Further, a security gate would be constructed at the start of the

gravel trail. This gate will restrict access to the southern beach, military units, and seasonally authorized recreational users.

To prevent the intermingling of recreational pedestrian traffic and tactical wheeled and tracked vehicles on the main beach road, a gravel tank trail would be constructed from the base of the bridge running behind the rental units to the access gate described above. This trail would be open to tactical vehicles only, though crossover walkways may be constructed to provide access to AIWW fishing.

Aside from the new pier, fencing, and tank trail, phased implementation of the plan is based on user group priorities. MCCS has identified the modified gateway to Onslow Beach as a priority. This involves the realignment of the north side of Onslow Beach Road and the construction of an Onslow Beach Complex, restaurant, community center, and expanded parking areas. The construction of new rental units would follow this initial phase.

4.3 Environmental Conservation

Development of the barrier island as described poses potential impacts to wildlife including rare or protected species. To reduce the impact of the proposed development, several initiatives must be incorporated into site plans and construction.

4.3.1 Lighting

Artificial lighting on beaches disrupts behaviors of nesting and hatchling sea turtles. Nighttime lighting is identified as a threat to the listed species in Federal recovery plans and is addressed in Camp Lejeune's own Biological Opinion addressing sea turtles on Onslow Beach.

All new construction will incorporate fixtures that minimize ambient light by directing the light only to where it is needed or intended. This is accomplished by utilizing Ballard or ground lighting to the maximum extent practical. When other fixtures are used, visors or shades will direct light downward and away from the beach or the fixture itself will be located in a position to minimize ambient lighting. Light fixtures will be selected using the guidelines presented in the Technical Report- Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches (Witherington et. al., 2000). In the interim, before new construction begins, all external lighting will be modified to comply with the guidance found in this report.

4.3.2 Site Selection and Design

Appendix E shows a landscape architect's renderings of proposed development along Onslow Beach. As site-specific design plans are produced for recreational facilities, impacts to areas of natural vegetation should be avoided as much as possible. These islands of natural areas are important to maintaining the ecology of the system by providing food and cover for wildlife, soil stabilization, and water filtration functions. As depicted, the proposed development largely avoids vegetated areas and any deviation should be thoroughly examined.

Further, stormwater management issues must be taken into consideration when choosing structural design. It may be

necessary to minimize the area of impervious material to remain consistent with development guidelines for areas adjacent to Class A waters.

4.3.3 Stormwater Management and Native Landscaping

Because Onslow Beach is surrounded by high quality waters, stormwater management becomes a crucial component to any development activities. One way to address stormwater issues is to utilize native landscaping to create scenic and functional vegetative buffers to trap and slowly release water from storm events. The creation of vegetative buffers throughout the developed recreational beach must be incorporated into specific site plans and should be executed throughout the life of this master plan.

Native landscaping will also benefit native wildlife species that depend on vegetative cover for food, nesting, and shelter. Currently, the recreational beach is severely lacking the scrub shrub habitats that characterize the northern and southern beaches. To connect these habitats across the length of the island, plantings of live oak, cedar, and other native trees and shrubs should be conducted in the recreational beach. In addition to providing wildlife habitat, these features will introduce more shade and aesthetic qualities to the urban landscape.

For example, proposed development includes the construction of a tank trail through the recreational portion of the beach to facilitate troop movements to the training beach. The trail, placed adjacent to rental units, will likely become a source of noise and dust. As a component of road design, a vegetative buffer should be incorporated to visually screen the trail while reducing noise and dust problems. This vegetated corridor will help connect the northern and southern scrub shrub habits described above.

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Chapter 5 Integrated Sustainability

5.1 Introduction

With ongoing and potential future uses of Onslow Beach defined, the next step is to develop ways of ensuring the sustainability of such uses. Sustainability of Onslow Beach is influenced by natural and man caused factors. A category four hurricane sweeping over Onslow Beach could quickly remove much of the recreational opportunities on the island by destroying facilities or disrupting access. The same storm could create a new inlet through the training portion of the beach, complicating amphibious landings.

Man made disturbances can also degrade sustainability. For example, should an ORRV driver accidentally strike a nesting sea turtle, recreational and operational activities could become severely limited due to legal consequences of that action. Similarly, if a collision occurred between a military training unit and a sunbather or surfer, military units could be required, in the interest of human safety, to insert more administrative pauses into their operations. These upsets to sustainability are as troublesome as natural impacts.

Whereas Camp Lejeune has no control over the path or intensity of a strong hurricane, it can control the scope, frequency, intensity, and timing of certain human activities. Such controls can be used to minimize negative impacts to long-range sustainability and can be evaluated and modified as necessary.

5.2 Administrative Measures

Processes and procedures already in place in the organizational structure of Camp Lejeune can be utilized to prevent impacts to long-term sustainability of Onslow Beach.

5.2.1 National Environmental Policy Act (NEPA)

Project sponsors representing each of the stakeholders for Onslow Beach must initiate the NEPA process for virtually all actions proposed for the barrier island. Because of the multiple environmental laws that apply to the barrier island, some level of interdisciplinary or interagency coordination is usually required.

The NEPA review process has evolved into the primary means for interdepartmental and interdisciplinary review of proposed projects. It is through the Environmental Impact Working Group (EIWG) that conflicts of interest are identified in addition to environmental issues. To prevent future conflicts, it is necessary that all proposed actions or projects be measured against the goals and direction described herein.

To facilitate implementation of the proposals described in this plan, an Environmental Assessment (EA) should be conducted to evaluate the potential effects of beach development as proposed in this plan. This would simplify the process of evaluating proposals for consistency with the plan as potential effects from new proposals could be compared to those documented in the EA.

5.2.2 Regulatory Measures

Existing Base Orders (BO) enact protective measures for sensitive training areas as well as species listed under the Endangered Species Act. Base Orders that apply to Onslow Beach are listed in Section 1.3.2 of this OBMP.

One of these BO's requires revision to accomplish identified issues affecting sustainability. BO 11015.7C addresses activities occurring in the sea turtle nesting season (15 May-31 October). The order requires military units to minimize nighttime landings and associated lighting, restricts vehicular traffic to areas below the high tide line, and limits recreational uses to those not requiring nighttime lighting. The United States Fish and Wildlife Service has recently required that Camp Lejeune evaluate the existing levels of artificial nighttime lighting and correct problem areas. Therefore, the Base Order should reflect this requirement as it relates to existing structures, future construction, and temporary beach activities that require illumination.

The of BO 11017.1F establishes an ORRV permitting system, prohibits drivers from damaging beach vegetation, and defines restricted areas. Further, the maximum number of ORRVs permited to be on Onslow Beach is set by AC/S I&E based upon the recommendation of the Environmental Conservation (ECON) Branch Head. BO 11017.F also restricts ORRV use on Onslow Beach to those times when no training is occurring. Seasonal restrictions can be seen in Figure 3.8.

BO 11017.1F has gone far in restricting access to environmentally sensitive areas of Onslow Beach in relation to ORRV traffic. ECON personnel are constantly assessing locations of posts and signs to make sure beach vegetation, shorebird nesting areas, and threatened or endangered species sites are adequately protected.

5.3 Coordination

Communication between beach stakeholders is imperative for sustainability. Information about projects or events that could disrupt utilization by another user group must be conveyed interdepartmentally. Such communication would prevent crisis situations and improve safety conditions for beach users.

5. 4 Enforcement

The Conservation Law Enforcement Office (CLEO) has primary responsibility for the enforcement of standing base orders as well as State and Federal laws on Onslow Beach. CLEO falls under the Environmental Conservation Branch (ECON) of the Environmental Management Division, which is part of the Installations and Environment Department (I&E).

Due to staffing limitations and limited availability of four-wheel drive vehicles, CLEO personnel cannot maintain a constant presence on the beach. Their patrols of the beach are limited relative to the intensity of use. Consequently, it sometimes appears to users that they can adopt an "anything goes" attitude in their utilization of Onslow Beach. However, ECON frequently is present on the beach during other periods and reports apparent violations to CLEO.

In order to maintain the sustainability of Onslow Beach, patrols must be increased so that an enforcement presence is noticeable to beach-goers, especially at times of high ORRV use.

Chapter 6 Plan Implementation

6.1 Introduction

The implementation of this plan depends upon the coordinated action of three departments: I&E, T&O, and MCCS. Each department has identified which plan elements are a priority for their organizational mission. A listing of projects is depicted in Table 6.1. To create the desired effect of compatible land use, some of these projects should be executed concurrently or consecutively.

Table 6.1 Onslow Beach Master Plan Project List

Dept.	Project
T&O	Fence / Gate Complex
	Graveled Tactical Trail
	Riseley Pier Replacement
MCCS	Road Realignment
	Beach Complex / Restaurant
	Community Center
	Boat Landing / Fishing Center
	50 Rental Lodging Units
	Shower / Bathroom Facility
	Riseley Pier Replacement
I&E (EMD)	Wetland Mitigation
	Vegetated Buffers
	Interpretative Nature Trail / Signs
	Duck Blinds (waterfowl impoundment)
	Boat Landing and Crosswalks to AIWW
	Education Outreach Materials
	Predator Control (Shorebirds)

6.1.1 Organizational Priorities

6.1.1.1 Training and Operations

Military trainers can be provided near term relief from incompatible uses by first erecting a fence and gate complex at the main beach access at Riseley Pier. This would control access of authorized ORRVs into the training beach and deter unauthorized ORRVs from entering.

To further segregate training from recreational activities, the proposed gravel tank trail running from the bridge to the existing gravel trail should be constructed. Simultaneously, crosswalks over the trail should be installed to provide AIWW shoreline-fishing opportunities, offsetting the reduced availability of the beach strand and drawing fishermen away from Riseley Pier and the training area.

Finally, the construction of a pier facility to replace Riseley would shift the concentration of recreational use away from the training area further reducing conflicting uses. This would be an expensive and complicated project but will serve the organizational missions of both T&O and MCCS.

6.1.1.2 Marine Corps Community Services

Deteriorating facilities in desperate need of replacement include the Beach Reservations Office and Exchange. These two functions and others would be accommodated by the construction of a Beach Complex at the gateway to

Onslow Beach. The complex would also provide laundry facilities and a central parking area for beach day use. Adjacent to the complex, an oceanfront restaurant would be constructed. To complete enhancements to recreational facilities, the boat landing/fishing center and the community center would be constructed prior to the construction of 50 rental units.

6.1.1.3 Installations and Environment

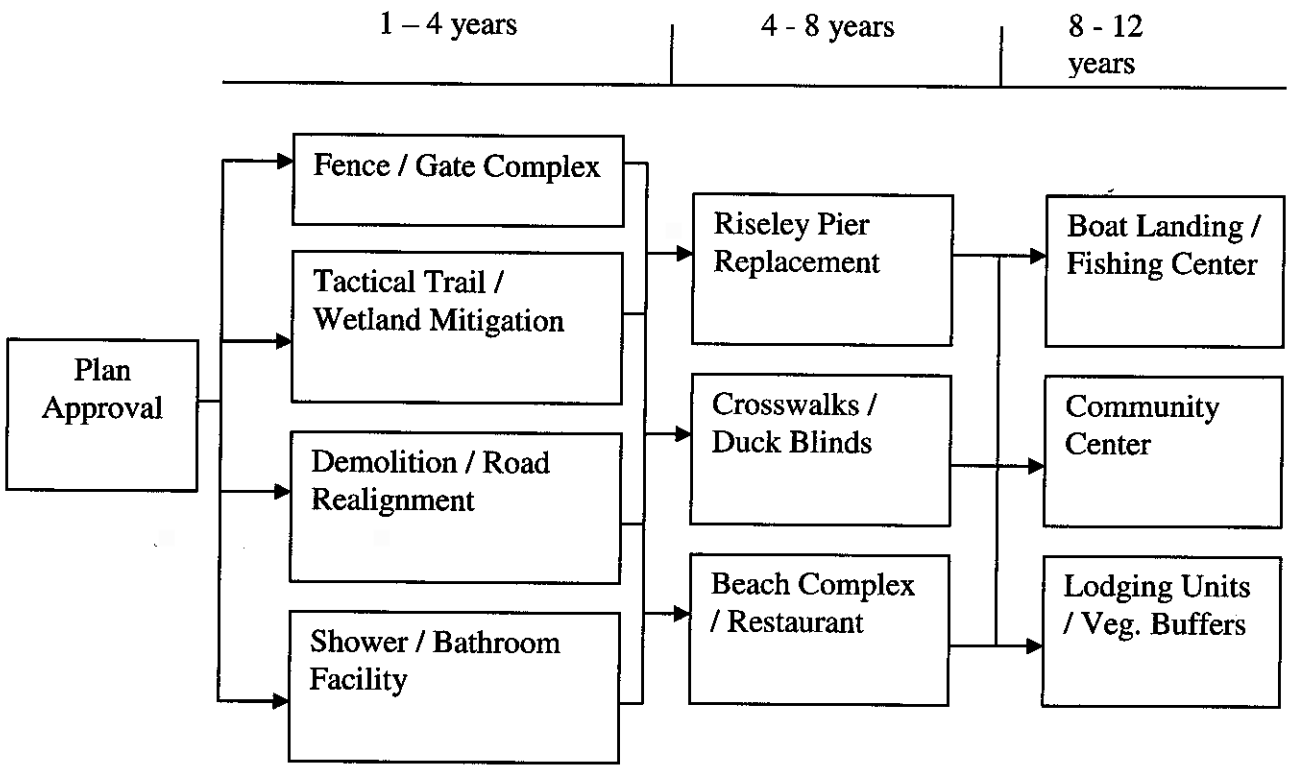
The Public Works (PWD) and Installation Development Divisions (IDD) would provide site-specific designs for most of the construction project proposed in the plan. It will be the responsibility of these divisions to ensure that building designs meet requirements for construction in hazard areas as well as to provide for minimal light pollution. Lighting problems can be avoided by selecting directed lighting and by strategic placement on structures. The Environmental Conservation Branch (ECON) would review site-specific designs to evaluate how proposed lighting will interact with nesting sea turtles. The PWD and IDD would also play a role in progressively retrofitting aboveground utility poles to belowground cables to enhance sustainability and to improve aesthetics.

The Environmental Management Division (EMD), specifically ECON would be involved in most or all aspects of plan implementation. Major projects that will have to be executed either prior to construction or concurrent with construction projects include:

- Evaluating need for Section 404, Clean Water Act permits and executing any required mitigation in support of the construction of the proposed graveled tactical trail and an improved boat landing
- Design and construction of vegetated buffers within the developed portion of the beach

Projects not specifically mentioned as having a requirement for concurrent or consecutive implementation may be executed as financial conditions allow. Figure 6.1 depicts a sequence of project implementation that would best accommodate compatible use of Onslow Beach in the near and long term. Two of the projects in particular, the replacement of Riseley Pier and the construction of a graveled tactical trail will require significant lead time for development as they pose potentially complex environmental considerations.

Figure 6.1 Proposed Implementation Schedule for Onslow Beach Master Plan Projects



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Appendix A Ocean Hazard Areas of Environmental Concern

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Ocean Hazard AECs {15A NCAC 7H .0306}

Definitions

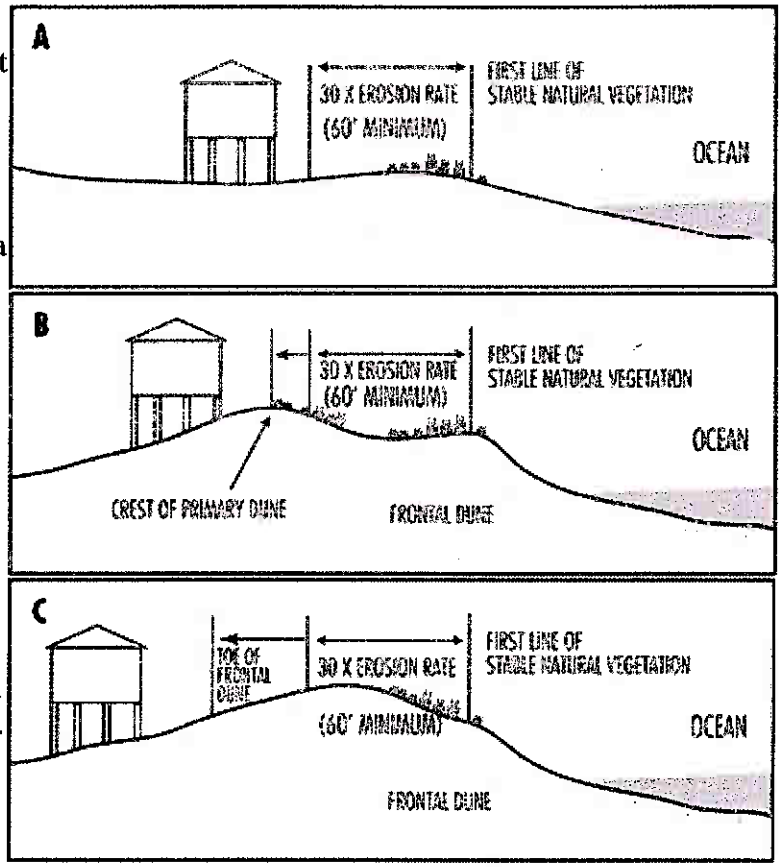
Primary Dune- is the first mound of sand (measured from the ocean) that is six feet taller than the mean flood level for the area. Frontal dunes are the first mounds of sand that have enough vegetation, height and continuity to offer protection. The crest of the primary dune and the landward toe of the frontal dune are determined on a case-by-case basis by the Division of Coastal Management.

The **first line of stable natural vegetation** is the first area on the oceanfront where natural dune-stabilizing plants are present. Such plants include sea oats and American beachgrass.

The following requirements apply to all development in the Ocean Hazard AEC {15A NCAC 7H .0306}:

- Your development must be located and designed to protect human lives and property from storms and erosion, to prevent permanent structures from encroaching on public beaches and reduce the public costs (such as disaster relief aid) that can result from poorly located development.
- Your development must incorporate all reasonable means and methods to avoid damage to the natural environment or public beach accessways. Reasonable means and methods include: limiting the scale of the project and the damage it causes; restoring a damaged site; or providing substitute resources to compensate for damage.
- No growth-inducing development paid for (in any part) by public funds will be permitted if it is likely to require more public funds for maintenance and continued use – unless the benefits of the project will outweigh the required public expenditures.
- Your project should be set as far back from the ocean as possible. At minimum, all building must be located behind the crest of the primary dune, the landward toe of the frontal dune or the erosion setback line - whichever is the farthest from the first line of stable natural vegetation (see Figure 3.1).

Figure 3.1



- Your project must not remove or relocate sands or vegetation from primary or frontal dunes.
- If you want to move a building that is in an ocean hazard area, you will need a CAMA permit. Buildings relocated with public funds must meet all AEC standards, including the setback requirement.
- Your project must comply with the local CAMA land use plan. A land use plan contains a community's goals, management policies and a map classifying land according to the types of development allowed.
- You must not place a mobile home within the high hazard flood area unless it is in a mobile home park that existed before June 1, 1979. Not only are mobile homes likely to be damaged by coastal storms, they are also likely to damage other buildings during storms.
- Your project must not cause major or irreversible damage to valuable archaeological or historic resources.
- The construction of publicly funded projects, such as sewers, water lines, roads, bridges and erosion control works, will be permitted only if they:
- greatly benefit the public, nation or state;
- don't promote additional development in ocean hazard AECs;
- won't damage natural buffers to erosion, wave wash and flooding;
- won't otherwise increase existing hazards.

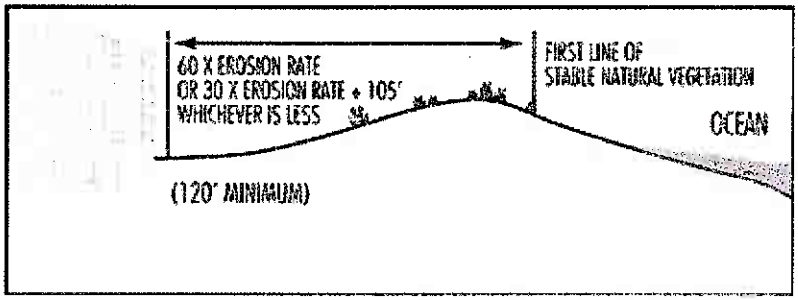
Setback Requirements for all development in the Ocean Hazard AEC

Note: The erosion setback line extends inland from the first line of stable natural vegetation.

- For small structures or single family homes, the line extends landward a distance of 30 times the average annual erosion rate at the site. In areas where erosion is less than 2 feet per year, the setback is 60 feet (see Figure 3.1A).

- Any structure of more than 5,000 square feet, such as a motel or condominium, must meet an additional setback requirement because of the unique physical, financial and legal problems posed by relocating these structures.
- For large structures, the erosion setback line extends inland from the first line of stable natural vegetation a distance of 60 times the average annual erosion rate at the site. The minimum setback is 120 feet (see Figure 3.2). *Note: In areas where the erosion rate is more than 3.5 feet a year, the setback line shall be set at a distance of 30 times the annual erosion rate plus 105 feet.*

Figure 3.2



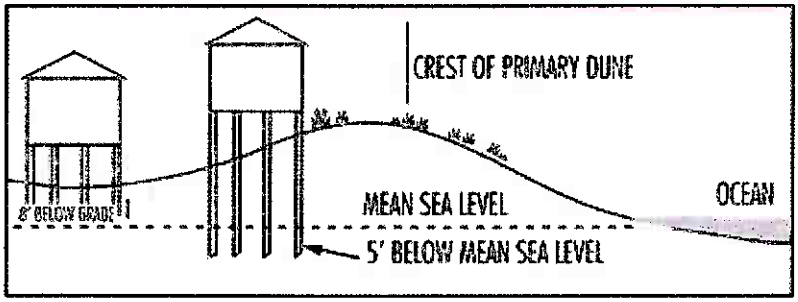
Coastal Management determines erosion rates for different segments of the state's ocean shoreline by analyzing a time-series of aerial photographs dating back to the 1930s. Erosion rates are updated about every five years and are adopted by the CRC.

- The following types of development may be permitted between the oceanfront setback line and the vegetation line if they don't remove or alter primary or frontal dunes or plants, if overwalks are used to protect dunes, and the projects meet all other AEC general rules:

    - campgrounds with no substantial permanent structures;
    - public fishing piers;
    - parking areas made from clay, packed sand or similar materials;
    - outdoor tennis courts;
    - beach access structures;
    - elevated decks with a footprint of less than 500 square feet;
    - uninhabitable storage sheds;
    - unenclosed, uninhabitable gazebos with a footprint of less than 200 square feet;
    - temporary amusement stands;
    - swimming pools.

- If the development is to be served by an onsite waste disposal system, a copy of a valid permit for this system from your county health department must be submitted with the CAMA permit application

Figure 3.3.


CREST OF PRIMARY DUNE
MEAN SEA LEVEL
OCEAN
5' BELOW MEAN SEA LEVEL

Appendix B Natural Communities on Onlsow Beach Island

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Definitions

Dune Grass- Sites occur in coastal areas immediately behind the beach. These communities occur in a highly dynamic and stressful environment. Blowing sand may bury plants and wind erosion may expose their roots. Even stabilized dunes are susceptible to forming blowouts if eroded or disturbed. The sand binding plants of the Dune Grass community trap blowing sand, causing the dune to build up higher and eventually stabilizing it. New dunes form on sand flats by deposition around plants.

Oceanward dunes are exposed to nearly continuous salt spray, which along with excessive drainage and shifting sand, exclude most species and maintain this community type. Sites which become more protected from salt spray by natural or artificial means eventually succeed to Maritime Shrub or Maritime Forest.

Maritime Dry Grassland- This natural community occurs in low stable dunes and overwash terraces behind or between low dunes, with occasional to frequent seawater overwash and sand burial. Most extensive examples are on low barrier islands with only low, open dunes. As with other barrier island communities, Maritime Dry Grasslands occur in a dynamic environment. Most of these sites, under natural conditions, are overwashed by salt water in severe storms. Overwash sand deposits may temporarily bury the vegetation, but the dominant species are well adapted to recover quickly from such natural disturbance. Most examples are also subject to some salt spray, which represents an ongoing stress that excludes many species.

With the artificial stabilization and enhancement of dune on many islands, many of these communities have been invaded by shrubs and are succeeding to Maritime Shrub or Maritime Forest. A similar succession may occur naturally if dune growth, movement, or beach accretion increases protection. Likewise, a Maritime Dry Grassland may develop if dunes are eroded and protection decreased in Maritime Shrub or Maritime Forest areas.

Maritime Shrub- Can be found in stabilized sand dunes, dune swales, and sand flats protected from salt water flooding and the most extreme salt spray. As with other barrier island communities, Maritime Shrub communities occur in a dynamic environment. They may be temporarily disturbed or permanently converted to other community types by sand dune migration, loss of protection from salt spray, or erosion in severe storms. Some examples are old and have long been stable. Others represent early stages of primary or secondary succession to Maritime Evergreen Forest. Salt spray represents an ongoing environmental stress which excludes most species and limits the stature of the vegetation. Increased protection from salt spray may result in succession to Maritime Evergreen Forest.

On many islands, artificial buildup of the dunes has increased protection from overwash on sand flats, allowing shrubs to invade these areas.

Maritime Evergreen forest- This natural community can be found amongst old stabilized dunes and flats, protected from salt water flooding and the most extreme salt spray. These communities occur in sheltered parts of the barrier islands, but they are still somewhat subject to the extremes of the maritime environment. Salt spray has long been recognized as an important on-going stress, sculpting the canopy and excluding most species (Wells 1939, Wells and Shunk 1937). The forests are also subject to periodic severe disturbance by the wind and heavy salt spray of hurricanes. Such disturbance may kill significant portions, but generally not all, of the forest canopy. Smaller storms may produce canopy gaps at a faster rare than is typical inland.

Other environmental factors that may be important in distinguishing the function of maritime communities from inland communities include excessive drainage in the sandy soils, constant supply of nutrients in salt spray, warmer winter temperatures, and longer growing seasons.

Sites that were logged or cleared in the past generally are strongly dominated by Pinus taeda, which apparently succeeds to oak dominance. It is not clear if storm disturbance produces similar succession. Dense thickets of shrubs and vines often develop in canopy openings, and may inhibit pine reproduction.

Geologic processes such as dune migration and erosion may directly destroy Maritime Evergreen Forests. The forests may also be indirectly converted to Maritime Shrub or Maritime Dry Grassland by the natural or artificial loss of the dunes that provide shelter from heavy salt spray.

These communities are capable of carrying fire, and apparently burned in the past, even before settlement (Bratton and Davison 1987). Undergrowth has apparently become much more dense since the cessation of burning and early grazing. Natural fire was probably significantly less frequent than in mainland forests.

Maritime Evergreen Forests are apparently very dependent on the integrity of the canopy for protection from the effects of salt spray. The canopy is often sculpted into a smooth, streamlined shape rising from Maritime Shrub gradually to a tall forest canopy. If a clearing is created, trees adjacent to it are exposed to greater salt deposition and wind, and often die.

Maritime Deciduous Forest- Occurs on most protected parts of old stabilized dunes and beach ridges on widest barrier islands. These communities are the most sheltered of any barrier island community from the stresses of the maritime environment. The high dune ridges and distance from the beach protect them from most salt spray and storm waves. They are, however, still subject to high winds and salt spray during storms, and may be more frequently disturbed than inland communities. Such disturbance may kill parts, but generally not all, of the canopy, producing a multi-aged population structure.

Sites vary in the amount of Pinus taeda present. This may be a result of past cutting or of natural disturbances.

Geologic processes such as dune migration and erosion may directly destroy Maritime Deciduous Forests. The forests may also be indirectly destroyed by the natural or artificial loss of the dunes that provided shelter from heavy salt spray.

The fire history of this community type is not well known. The rugged topography and interspersion of wetlands in the known examples may make fires unlikely to spread far. Some of the trees present, such as Fagus grandifolia, are rather intolerant of fire, but typically fire-dependent trees such as Pinus palustris may also be present.

Upper Beach- **Occurs on the oceanward shores of barrier islands. These are, of course, very dynamic communities, dependent on regular natural disturbance. If protected from disturbance they quickly succeed to perennial-dominated Dune Grass communities. Disturbance is of varying degree and frequency, ranging from daily blowing sands to occasional severe overwash and reworking of sand by hurricanes or other storms.**

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Appendix C Vegetation on Onslow Beach

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Table C-1. Principal plant species that occurred in mapped vegetation and land cover types by Versar, Inc. at Onslow Beach, Marine Corps Base Camp Lejeune, North Carolina, May 2003.

UPLAND DUNE COMMUNITY		
Common Name	**Scientific Name**	**Family**
Common Yucca	*Yucca filamentosa*	Agavaceae
Moundlily Yucca	*Yucca gloriosa*	Agavaceae
Winged Sumac	*Rhus copallina*	Anacardiaceae
Winged Sumac	*Rhus copallina*	Anacardiaceae
Poison Ivy	*Toxicodendron radicans ssp radicans*	Anacardiaceae
Sweet Fennel	*Foeniculum vulgare*	Apiaceae
Sweet Fennel	*Foeniculum vulgare*	Apiaceae
American Holly	*Ilex opaca*	Aquifoliaceae
Yaupon Holly	*Ilex vomitoria*	Aquifoliaceae
Hercules Club	*Aralia spinosa*	Araliaceae
Angular-fruited Milkvine	*Matelea gonocarpa*	Asclepiadaceae
Annual Ragweed	*Ambrosia artemisiifolia*	Asteraceae
Horseweed	*Conyza canadensis var canadensis*	Asteraceae
Tobaccoweed	*Elephantopus tomentosus*	Asteraceae
Late-flowering Thorough-wort	*Eupatorium serotinum*	Asteraceae
Canada Lettuce	*Lactuca canadensis*	Asteraceae
Hairy Lettuce	*Lactuca hirsuta*	Asteraceae
Spiny-leaf Sowthistle	*Sonchus asper*	Asteraceae
Annual Ragweed	*Ambrosia artemisiifolia*	Asteraceae
Sea Oxeye	*Borrichia frutescens*	Asteraceae
Horseweed	*Conyza canadensis var canadensis*	Asteraceae
Tobaccoweed	*Elephantopus tomentosus*	Asteraceae
Fireweed	*Erechtites hieraciifolia*	Asteraceae
Oak-leaf Fleabane	*Erigeron quercifolius*	Asteraceae
Small Dog-fennel Thoroughwort	*Eupatorium capillifolium*	Asteraceae
Late-flowering Thorough-wort	*Eupatorium serotinum*	Asteraceae
Fragrant Cudweed	*Gnaphalium obtusifolium*	Asteraceae
Five-leaf Sneezeweed	*Helenium amarum*	Asteraceae
Camphorweed Golden-aster	*Heterotheca subaxillaris*	Asteraceae
Hairy Hawkweed	*Hieracium gronovii*	Asteraceae
Canada Lettuce	*Lactuca canadensis*	Asteraceae
Woodland Lettuce	*Lactuca floridana*	Asteraceae
Grass-leaved Lettuce	*Lactuca graminifolia*	Asteraceae
Hairy Lettuce	*Lactuca hirsuta*	Asteraceae
Carolina False-dandelion	*Pyrrhopappus carolinianus*	Asteraceae
Sweet Goldenrod	*Solidago odora*	Asteraceae
Seaside Goldenrod	*Solidago sempervirens*	Asteraceae
Spiny-leaf Sowthistle	*Sonchus asper*	Asteraceae
Yellow Crownbeard	*Verbesina occidentalis*	Asteraceae
Sea Rocket	*Cakile edentula ssp edentula*	Brassicaceae
Flat-beaked Sea Rocket	*Cakile edentula ssp harperi*	Brassicaceae
Poor-man's Pepper-grass	*Lepidium virginicum*	Brassicaceae

Spanish Moss	*Tillandsia usneoides*	Bromeliaceae
Eastern Prickly-pear	*Opuntia humifusa*	Cactaceae
Coastal Prickly Pear	*Opuntia pusilla*	Cactaceae
Clasp-leaf Venus'-looking-glass	*Triodanis perfoliata*	Campanulaceae
Japanese Honeysuckle	*Lonicera japonica*	Caprifoliaceae
Trumpet Honeysuckle	*Lonicera sempervirens*	Caprifoliaceae
Spreading Sandwort	*Arenaria lanuginosa*	Caryophyllaceae
Baldwin's Nailwort	*Paronychia baldwinii ssp riparia*	Caryophyllaceae
White Goosefoot	*Chenopodium album*	Chenopodiaceae
Wormseed Goosefoot	*Chenopodium ambrosioides*	Chenopodiaceae
Slender Dayflower	*Commelina erecta*	Commelinaceae
Hedge Bindweed	*Calystegia sepium*	Convolvulaceae
Flowering Dogwood	*Cornus florida*	Cornaceae
Creeping Cucumber	*Melothria pendula*	Cucurbitaceae
Ground Juniper	*Juniperus communis*	Cupressaceae
Eastern Red Cedar	*Juniperus virginiana*	Cupressaceae
Bracken Fern	*Pteridium aquilinum*	Dennstaedtiaceae
Persimmon	*Diospyros virginiana*	Ebenaceae
Farkleberry	*Vaccinium arboreum*	Ericaceae
Squaw Huckleberry	*Vaccinium stamineum*	Ericaceae
Slender Copperleaf	*Acalypha gracilens*	Euphorbiaceae
Narrow-leaf Tick-trefoil	*Desmodium paniculatum*	Fabaceae
Perplexed Tick-trefoil	*Desmodium perplexum*	Fabaceae
Downy Milkpea	*Galactia volubilis*	Fabaceae
Carolina Indigo	*Indigofera caroliniana*	Fabaceae
Chinese Bushclover	*Lespedeza cuneata*	Fabaceae
White Sweet-clover	*Melilotus albus*	Fabaceae
Trailing Wild-bean	*Strophostyles helvula*	Fabaceae
Low Hop Clover	*Trifolium campestre*	Fabaceae
Spring Vetch	*Vicia sativa*	Fabaceae
Spanish Oak	*Quercus falcata*	Fagaceae
Laurel-leaf Oak	*Quercus laurifolia*	Fagaceae
Water Oak	*Quercus nigra*	Fagaceae
Live Oak	*Quercus virginiana*	Fagaceae
American Witch-hazel	*Hamamelis virginiana*	Hamamelidaceae
Sweet Gum	*Liquidambar styraciflua*	Hamamelidaceae
Horsemint	*Monarda punctata var villicaulis*	Lamiaceae
Forked Bluecurls	*Trichostema dichotomum*	Lamiaceae
Upland Red Bay	*Persea borbonia*	Lauraceae
Sassafras	*Sassafras albidum*	Lauraceae
Field Garlic	*Allium vineale*	Liliaceae
Yellow Jessamine	*Gelsemium sempervirens*	Loganiaceae
Koehne Ammannia	*Ammannia latifolia*	Lythraceae
Southern Bayberry	*Myrica cerifera*	Myricaceae
Evergreen Bayberry	*Myrica heterophylla*	Myricaceae
Northern Bayberry	*Myrica pensylvanica*	Myricaceae
Black Tupelo	*Nyssa sylvatica*	Nyssaceae
Wild Olive	*Osmanthus americanus*	Oleaceae

Southern Butterfly-weed	*Gaura angustifolia*	Onagraceae
Narrow-leaved Sundrops	*Oenothera fruticosa*	Onagraceae
Sea-beach Evening-primrose	*Oenothera humifusa*	Onagraceae
Common Pokeweed	*Phytolacca americana*	Phytolaccaceae
Loblolly Pine	*Pinus taeda*	Pinaceae
English Plantain	*Plantago lanceolata*	Plantaginaceae
American Beachgrass	*Ammophila breviligulata*	Poaceae
Broom-sedge	*Andropogon virginicus*	Poaceae
Dune Sandbur	*Cenchrus tribuloides*	Poaceae
Slender Spikegrass	*Chasmanthium laxum*	Poaceae
Bermuda-grass	*Cynodon dactylon*	Poaceae
Variable Witchgrass	*Dichanthelium commutatum*	Poaceae
Cypress Witchgrass	*Dichanthelium dichotomum*	Poaceae
Hairy Crabgrass	*Digitaria sanguinalis*	Poaceae
Shaggy Crabgrass	*Digitaria villosa*	Poaceae
Barnyard Grass	*Echinochloa crus-galli*	Poaceae
Smaller Sea-beach Pea	*Panicum amarum*	Poaceae
Slender 8-flowered Fescue	*Vulpia octoflora var octoflora*	Poaceae
Squirrel Six-weeks Grass	*Vulpia sciurea*	Poaceae
Coastal Virgin's-bower	*Clematis catesbyana*	Ranunculaceae
Virginia Virgin-bower	*Clematis virginiana*	Ranunculaceae
Supple-jack	*Berchemia scandens*	Rhamnaceae
Red Chokeberry	*Aronia arbutifolia*	Rosaceae
Carolina Laurel Cherry	*Prunus caroliniana*	Rosaceae
Wild Black Cherry	*Prunus serotina*	Rosaceae
Prickly Florida Blackberry	*Rubus argutus*	Rosaceae
Southern Dewberry	*Rubus trivialis*	Rosaceae
Rough Buttonweed	*Diodia teres*	Rubiaceae
Larger Button-weed	*Diodia virginiana*	Rubiaceae
Coast Bedstraw	*Galium hispidulum*	Rubiaceae
Blunt-leaf Bedstraw	*Galium obtusum*	Rubiaceae
Hairy Bedstraw	*Galium pilosum*	Rubiaceae
Partridge-berry	*Mitchella repens*	Rubiaceae
Hercules-club	*Zanthoxylum clava-herculis*	Rutaceae
Carolina Willow	*Salix caroliniana*	Salicaceae
Buckthorn Bumelia	*Sideroxylon lycioides*	Sapotaceae
Saltmarsh Gerardia	*Agalinis maritima*	Scrophulariaceae
Great Mullein	*Verbascum thapsus*	Scrophulariaceae
Earleaf Greenbrier	*Smilax auriculata*	Smilacaceae
Saw Greenbrier	*Smilax bona-nox*	Smilacaceae
Glaucous-leaved Greenbrier	*Smilax glauca*	Smilacaceae
Laurel-leaf Greenbrier	*Smilax laurifolia*	Smilacaceae
Common Greenbrier	*Smilax rotundifolia*	Smilacaceae
Graceful Nightshade	*Solanum pseudogracile*	Solanaceae
Narrow-leaved Cattail	*Typha angustifolia*	Typhaceae
Broad-leaf Cattail	*Typha latifolia*	Typhaceae
Sugarberry	*Celtis laevigata*	Ulmaceae
Sandpaper Vervain	*Verbena scabra*	Verbenaceae
Pepper-vine	*Ampelopsis arborea*	Vitaceae

Virginia Creeper	*Parthenocissus quinquefolia*	Vitaceae
Summer Grape	*Vitis aestivalis*	Vitaceae
Northern Fox Grape	*Vitis labrusca*	Vitaceae
Muscadine Grape	*Vitis rotundifolia*	Vitaceae
COASTAL SHRUB-SCRUB		
Red Maple	*Acer rubrum*	Aceraceae
Winged Sumac	*Rhus copallina*	Anacardiaceae
Winged Sumac	*Rhus copallina*	Anacardiaceae
Poison Ivy	*Toxicodendron radicans ssp radicans*	Anacardiaceae
Sweet Fennel	*Foeniculum vulgare*	Apiaceae
Sweet Fennel	*Foeniculum vulgare*	Apiaceae
Coastal-plain Penny-wort	*Hydrocotyle bonariensis*	Apiaceae
Many-flowered Pennywort	*Hydrocotyle umbellata*	Apiaceae
Whorled Pennywort	*Hydrocotyle verticillata*	Apiaceae
Eastern Lilaeopsis	*Lilaeopsis chinensis*	Apiaceae
Mock Bishop-weed	*Ptilimnium capillaceum*	Apiaceae
Short-styled Sanicle	*Sanicula canadensis*	Apiaceae
American Holly	*Ilex opaca*	Aquifoliaceae
Yaupon Holly	*Ilex vomitoria*	Aquifoliaceae
Hercules Club	*Aralia spinosa*	Araliaceae
Dwarf Palmetto	*Sabal minor*	Arecaceae
Gulf Coast Swallow-wort	*Cynanchum angustifolium*	Asclepiadaceae
Angular-fruited Milkvine	*Matelea gonocarpa*	Asclepiadaceae
Ebony Spleenwort	*Asplenium platyneuron*	Aspleniaceae
Annual Ragweed	*Ambrosia artemisiifolia*	Asteraceae
Horseweed	*Conyza canadensis var canadensis*	Asteraceae
Tobaccoweed	*Elephantopus tomentosus*	Asteraceae
Late-flowering Thorough-wort	*Eupatorium serotinum*	Asteraceae
Canada Lettuce	*Lactuca canadensis*	Asteraceae
Hairy Lettuce	*Lactuca hirsuta*	Asteraceae
Spiny-leaf Sowthistle	*Sonchus asper*	Asteraceae
Annual Ragweed	*Ambrosia artemisiifolia*	Asteraceae
Eastern Baccharis	*Baccharis halimifolia*	Asteraceae
Spanish-needles	*Bidens bipinnata*	Asteraceae
Sea Oxeye	*Borrichia frutescens*	Asteraceae
Horseweed	*Conyza canadensis var canadensis*	Asteraceae
Tobaccoweed	*Elephantopus tomentosus*	Asteraceae
Fireweed	*Erechtites hieraciifolia*	Asteraceae
Oak-leaf Fleabane	*Erigeron quercifolius*	Asteraceae
Small Dog-fennel Thoroughwort	*Eupatorium capillifolium*	Asteraceae
Late-flowering Thorough-wort	*Eupatorium serotinum*	Asteraceae
Fragrant Cudweed	*Gnaphalium obtusifolium*	Asteraceae
Five-leaf Sneezeweed	*Helenium amarum*	Asteraceae
Camphorweed Golden-aster	*Heterotheca subaxillaris*	Asteraceae
Hairy Hawkweed	*Hieracium gronovii*	Asteraceae
Canada Lettuce	*Lactuca canadensis*	Asteraceae

Woodland Lettuce	*Lactuca floridana*	Asteraceae
Grass-leaved Lettuce	*Lactuca graminifolia*	Asteraceae
Hairy Lettuce	*Lactuca hirsuta*	Asteraceae
Climbing Hempweed	*Mikania scandens*	Asteraceae
Carolina False-dandelion	*Pyrrhopappus carolinianus*	Asteraceae
Sweet Goldenrod	*Solidago odora*	Asteraceae
Seaside Goldenrod	*Solidago sempervirens*	Asteraceae
Spiny-leaf Sowthistle	*Sonchus asper*	Asteraceae
Yellow Crownbeard	*Verbesina occidentalis*	Asteraceae
American Hornbeam	*Carpinus caroliniana*	Betulaceae
Virginia Chainfern	*Woodwardia virginica*	Blechnaceae
Sea Rocket	*Cakile edentula ssp edentula*	Brassicaceae
Flat-beaked Sea Rocket	*Cakile edentula ssp harperi*	Brassicaceae
Poor-man's Pepper-grass	*Lepidium virginicum*	Brassicaceae
Spanish Moss	*Tillandsia usneoides*	Bromeliaceae
Eastern Prickly-pear	*Opuntia humifusa*	Cactaceae
Coastal Prickly Pear	*Opuntia pusilla*	Cactaceae
Clasp-leaf Venus'-looking-glass	*Triodanis perfoliata*	Campanulaceae
Japanese Honeysuckle	*Lonicera japonica*	Caprifoliaceae
Trumpet Honeysuckle	*Lonicera sempervirens*	Caprifoliaceae
Spreading Sandwort	*Arenaria lanuginosa*	Caryophyllaceae
Baldwin's Nailwort	*Paronychia baldwinii ssp riparia*	Caryophyllaceae
White Goosefoot	*Chenopodium album*	Chenopodiaceae
Wormseed Goosefoot	*Chenopodium ambrosioides*	Chenopodiaceae
St. Andrew's Cross	*Hypericum hypericoides*	Clusiaceae
Slender Dayflower	*Commelina erecta*	Commelinaceae
Hedge Bindweed	*Calystegia sepium*	Convolvulaceae
Flowering Dogwood	*Cornus florida*	Cornaceae
Creeping Cucumber	*Melothria pendula*	Cucurbitaceae
Ground Juniper	*Juniperus communis*	Cupressaceae
Eastern Red Cedar	*Juniperus virginiana*	Cupressaceae
Broadwing Sedge	*Carex alata*	Cyperaceae
Greenish-white Sedge	*Carex albolutescens*	Cyperaceae
Fescue Sedge	*Carex festucacea*	Cyperaceae
Jamaica Sawgrass	*Cladium jamaicense*	Cyperaceae
Rusty Flatsedge	*Cyperus odoratus*	Cyperaceae
Coast Flatsedge	*Cyperus polystachyos var texensis*	Cyperaceae
Retrorse Flatsedge	*Cyperus retrorsus*	Cyperaceae
Four-angled Flatsedge	*Cyperus tetragonus*	Cyperaceae
White Spikerush	*Eleocharis albida*	Cyperaceae
Olney Threesquare	*Schoenoplectus americanus (Scirpus americanus)*	Cyperaceae
Cottongrass Bulrush	*Scirpus cyperinus*	Cyperaceae
Saltmarsh Bulrush	*Schoenoplectus robustus*	Cyperaceae
Whip Nutrush	*Scleria triglomerata*	Cyperaceae
Swamp Cyrilla	*Cyrilla racemiflora*	Cyrillaceae
Bracken Fern	*Pteridium aquilinum*	Dennstaedtiaceae
Persimmon	*Diospyros virginiana*	Ebenaceae

Highbush Blueberry	*Vaccinium corymbosum*	Ericaceae
Squaw Huckleberry	*Vaccinium stamineum*	Ericaceae
Slender Copperleaf	*Acalypha gracilens*	Euphorbiaceae
Seaside Spurge	*Chamaesyce polygonifolia*	Euphorbiaceae
Risky Tread-softly	*Cnidoscolus stimulosus*	Euphorbiaceae
False Indigo-bush	*Amorpha fruticosa*	Fabaceae
Narrow-leaf Tick-trefoil	*Desmodium paniculatum*	Fabaceae
Perplexed Tick-trefoil	*Desmodium perplexum*	Fabaceae
Downy Milkpea	*Galactia volubilis*	Fabaceae
Carolina Indigo	*Indigofera caroliniana*	Fabaceae
Chinese Bushclover	*Lespedeza cuneata*	Fabaceae
White Sweet-clover	*Melilotus albus*	Fabaceae
Trailing Wild-bean	*Strophostyles helvula*	Fabaceae
Low Hop Clover	*Trifolium campestre*	Fabaceae
Spring Vetch	*Vicia sativa*	Fabaceae
Spanish Oak	*Quercus falcata*	Fagaceae
Laurel-leaf Oak	*Quercus laurifolia*	Fagaceae
Water Oak	*Quercus nigra*	Fagaceae
Live Oak	*Quercus virginiana*	Fagaceae
Carolina Crane's-bill	*Geranium carolinianum*	Geraniaceae
American Witch-hazel	*Hamamelis virginiana*	Hamamelidaceae
Sweet Gum	*Liquidambar styraciflua*	Hamamelidaceae
Leathery Rush	*Juncus coriaceus*	Juncaceae
Forked Rush	*Juncus dichotomus*	Juncaceae
Grassleaf Rush	*Juncus marginatus*	Juncaceae
Big-head Rush	*Juncus megacephalus*	Juncaceae
Horsemint	*Monarda punctata var villicaulis*	Lamiaceae
Forked Bluecurls	*Trichostema dichotomum*	Lamiaceae
Upland Red Bay	*Persea borbonia*	Lauraceae
Sassafras	*Sassafras albidum*	Lauraceae
Field Garlic	*Allium vineale*	Liliaceae
Yellow Jessamine	*Gelsemium sempervirens*	Loganiaceae
Koehne Ammannia	*Ammannia latifolia*	Lythraceae
Narrow Loosestrife	*Lythrum lineare*	Lythraceae
Sweetbay Magnolia	*Magnolia virginiana*	Magnoliaceae
Red-berried Moonseed	*Cocculus carolinus*	Menispermaceae
Southern Bayberry	*Myrica cerifera*	Myricaceae
Evergreen Bayberry	*Myrica heterophylla*	Myricaceae
Northern Bayberry	*Myrica pensylvanica*	Myricaceae
Black Tupelo	*Nyssa sylvatica*	Nyssaceae
Wild Olive	*Osmanthus americanus*	Oleaceae
Southern Butterfly-weed	*Gaura angustifolia*	Onagraceae
Seaside Seedbox	*Ludwigia maritima*	Onagraceae
Marsh Seedbox	*Ludwigia palustris*	Onagraceae
Narrow-leaved Sundrops	*Oenothera fruticosa*	Onagraceae
Sea-beach Evening-primrose	*Oenothera humifusa*	Onagraceae
Grassleaf Ladies'-tresses	*Spiranthes praecox*	Orchidaceae
Twisted Ladies'-tresses	*Spiranthes vernalis*	Orchidaceae
Royal Fern	*Osmunda regalis*	Osmundaceae

Yellow Passionflower	*Passiflora lutea*	Passifloraceae
Common Pokeweed	*Phytolacca americana*	Phytolaccaceae
Long-leaf Pine	*Pinus palustris*	Pinaceae
Loblolly Pine	*Pinus taeda*	Pinaceae
English Plantain	*Plantago lanceolata*	Plantaginaceae
Broom-sedge	*Andropogon virginicus*	Poaceae
Cypress Witchgrass	*Dichanthelium dichotomum*	Poaceae
Hemlock Witchgrass	*Dichanthelium sabulorum*	Poaceae
Barnyard Grass	*Echinochloa crus-galli*	Poaceae
India Goosegrass	*Eleusine indica*	Poaceae
Virginia Wild-rye	*Elymus virginicus*	Poaceae
Big-top Lovegrass	*Eragrostis hirsuta*	Poaceae
Purple Love-grass	*Eragrostis spectabilis*	Poaceae
Narrow Melic Grass	*Melica mutica*	Poaceae
Long-awn Hairgrass	*Muhlenbergia capillaris*	Poaceae
Smaller Sea-beach Pea	*Panicum amarum*	Poaceae
Warty Panicgrass	*Panicum verrucosum*	Poaceae
Old Switch Panic Grass	*Panicum virgatum*	Poaceae
Slender Paspalum	*Paspalum setaceum var ciliatifolium*	Poaceae
May Grass	*Phalaris caroliniana*	Poaceae
Giant Foxtail	*Setaria magna*	Poaceae
Prairie Wedgegrass	*Sphenopholis obtusata*	Poaceae
West Indian Dropseed	*Sporobolus indicus*	Poaceae
Purple Sandgrass	*Triplasis purpurea*	Poaceae
Water Pimpernel	*Samolus valerandi ssp parviflorus*	Primulaceae
Coastal Virgin's-bower	*Clematis catesbyana*	Ranunculaceae
Virginia Virgin-bower	*Clematis virginiana*	Ranunculaceae
Supple-jack	*Berchemia scandens*	Rhamnaceae
Carolina Laurel Cherry	*Prunus caroliniana*	Rosaceae
Wild Black Cherry	*Prunus serotina*	Rosaceae
Prickly Florida Blackberry	*Rubus argutus*	Rosaceae
Southern Dewberry	*Rubus trivialis*	Rosaceae
Rough Buttonweed	*Diodia teres*	Rubiaceae
Larger Button-weed	*Diodia virginiana*	Rubiaceae
Coast Bedstraw	*Galium hispidulum*	Rubiaceae
Blunt-leaf Bedstraw	*Galium obtusum*	Rubiaceae
Hairy Bedstraw	*Galium pilosum*	Rubiaceae
Partridge-berry	*Mitchella repens*	Rubiaceae
Hercules-club	*Zanthoxylum clava-herculis*	Rutaceae
Carolina Willow	*Salix caroliniana*	Salicaceae
Buckthorn Bumelia	*Sideroxylon lycioides*	Sapotaceae
Great Mullein	*Verbascum thapsus*	Scrophulariaceae
Earleaf Greenbrier	*Smilax auriculata*	Smilacaceae
Saw Greenbrier	*Smilax bona-nox*	Smilacaceae
Glaucous-leaved Greenbrier	*Smilax glauca*	Smilacaceae
Laurel-leaf Greenbrier	*Smilax laurifolia*	Smilacaceae
Common Greenbrier	*Smilax rotundifolia*	Smilacaceae
Graceful Nightshade	*Solanum pseudogracile*	Solanaceae
Narrow-leaved Cattail	*Typha angustifolia*	Typhaceae

Broad-leaf Cattail	*Typha latifolia*	Typhaceae
Sugarberry	*Celtis laevigata*	Ulmaceae
Florida Pellitory	*Parietaria floridana*	Urticaceae
Beaked Corn-salad	*Valerianella radiata*	Valerianaceae
French Mulberry	*Callicarpa americana*	Verbenaceae
Common Frog-fruit	*Phyla nodiflora*	Verbenaceae
Sandpaper Vervain	*Verbena scabra*	Verbenaceae
Pepper-vine	*Ampelopsis arborea*	Vitaceae
Virginia Creeper	*Parthenocissus quinquefolia*	Vitaceae
Summer Grape	*Vitis aestivalis*	Vitaceae
Northern Fox Grape	*Vitis labrusca*	Vitaceae
Muscadine Grape	*Vitis rotundifolia*	Vitaceae
TIDAL MARSH		
Shoreline Sea-purslane	*Sesuvium portulacastrum*	Aizoaceae
Waterhemp Pigweed	*Amaranthus cannabinus*	Amaranthaceae
Annual Saltmarsh Aster	*Aster subulatus*	Asteraceae
Perennial Salt-marsh Aster	*Aster tenuifolius*	Asteraceae
Eastern Baccharis	*Baccharis halimifolia*	Asteraceae
Spanish-needles	*Bidens bipinnata*	Asteraceae
Sea Oxeye	*Borrichia frutescens*	Asteraceae
Big-leaf Marsh-elder	*Iva frutescens*	Asteraceae
Sea-coast Marsh-elder	*Iva imbricata*	Asteraceae
Climbing Hempweed	*Mikania scandens*	Asteraceae
Stinking Camphorweed	*Pluchea foetida*	Asteraceae
Shrubby Camphor-weed	*Pluchea odorata*	Asteraceae
Seaside Goldenrod	*Solidago sempervirens*	Asteraceae
Halberd-leaf Saltbush	*Atriplex patula*	Chenopodiaceae
Virginia Glasswort	*Salicornia virginica*	Chenopodiaceae
Narrow-leaf Seepweed	*Suaeda linearis*	Chenopodiaceae
Saltmarsh Morning-glory	*Ipomoea sagittata*	Convolvulaceae
Olney Threesquare	*Schoenoplectus americanus (Scirpus americanus)*	Cyperaceae
Saltmarsh Bulrush	*Schoenoplectus robustus*	Cyperaceae
Roemer's Rush	*Juncus roemerianus*	Juncaceae
Seaside Seedbox	*Ludwigia maritima*	Onagraceae
Marsh Seedbox	*Ludwigia palustris*	Onagraceae
Sea-beach Evening-primrose	*Oenothera humifusa*	Onagraceae
Sea-lavender	*Limonium carolinianum*	Plumbaginaceae
Seashore Saltgrass	*Distichlis spicata*	Poaceae
Saltwater Cordgrass	*Spartina alterniflora*	Poaceae
Salt-meadow Cordgrass	*Spartina patens*	Poaceae
Narrow-leaved Cattail	*Typha angustifolia*	Typhaceae
FRESHWATER MARSH		
Red Maple	*Acer rubrum*	Aceraceae
Waterhemp Pigweed	*Amaranthus cannabinus*	Amaranthaceae
Poison Ivy	*Toxicodendron radicans ssp radicans*	Anacardiaceae
Coastal-plain Penny-wort	*Hydrocotyle bonariensis*	Apiaceae
Many-flowered Pennywort	*Hydrocotyle umbellata*	Apiaceae

Whorled Pennywort	*Hydrocotyle verticillata*	Apiaceae
Eastern Lilaeopsis	*Lilaeopsis chinensis*	Apiaceae
Mock Bishop-weed	*Ptilimnium capillaceum*	Apiaceae
Dwarf Palmetto	*Sabal minor*	Arecaceae
Eastern Baccharis	*Baccharis halimifolia*	Asteraceae
Spanish-needles	*Bidens bipinnata*	Asteraceae
Sea Oxeye	*Borrichia frutescens*	Asteraceae
Big-leaf Marsh-elder	*Iva frutescens*	Asteraceae
Sea-coast Marsh-elder	*Iva imbricata*	Asteraceae
Climbing Hempweed	*Mikania scandens*	Asteraceae
American Hornbeam	*Carpinus caroliniana*	Betulaceae
Virginia Chainfern	*Woodwardia virginica*	Blechnaceae
St. Andrew's Cross	*Hypericum hypericoides*	Clusiaceae
Broadwing Sedge	*Carex alata*	Cyperaceae
Greenish-white Sedge	*Carex albolutescens*	Cyperaceae
Fescue Sedge	*Carex festucacea*	Cyperaceae
Jamaica Sawgrass	*Cladium jamaicense*	Cyperaceae
Rusty Flatsedge	*Cyperus odoratus*	Cyperaceae
Coast Flatsedge	*Cyperus polystachyos var texensis*	Cyperaceae
Retrorse Flatsedge	*Cyperus retrorsus*	Cyperaceae
Four-angled Flatsedge	*Cyperus tetragonus*	Cyperaceae
White Spikerush	*Eleocharis albida*	Cyperaceae
Olney Threesquare	*Schoenoplectus americanus (Scirpus americanus)*	Cyperaceae
Cottongrass Bulrush	*Scirpus cyperinus*	Cyperaceae
Whip Nutrush	*Scleria triglomerata*	Cyperaceae
Swamp Cyrilla	*Cyrilla racemiflora*	Cyrillaceae
Persimmon	*Diospyros virginiana*	Ebenaceae
Highbush Blueberry	*Vaccinium corymbosum*	Ericaceae
Coast Rose-gentian	*Sabatia calycina*	Gentianaceae
Sea Pink	*Sabatia stellaris*	Gentianaceae
Sweet Gum	*Liquidambar styraciflua*	Hamamelidaceae
Leathery Rush	*Juncus coriaceus*	Juncaceae
Forked Rush	*Juncus dichotomus*	Juncaceae
Grassleaf Rush	*Juncus marginatus*	Juncaceae
Big-head Rush	*Juncus megacephalus*	Juncaceae
Red Bay	*Persea borbonia*	Lauraceae
Yellow Jessamine	*Gelsemium sempervirens*	Loganiaceae
Sweetbay Magnolia	*Magnolia virginiana*	Magnoliaceae
Southern Bayberry	*Myrica cerifera*	Myricaceae
Evergreen Bayberry	*Myrica heterophylla*	Myricaceae
Northern Bayberry	*Myrica pensylvanica*	Myricaceae
Black Tupelo	*Nyssa sylvatica*	Nyssaceae
Marsh Seedbox	*Ludwigia palustris*	Onagraceae
Grassleaf Ladies'-tresses	*Spiranthes praecox*	Orchidaceae
Twisted Ladies'-tresses	*Spiranthes vernalis*	Orchidaceae
Royal Fern	*Osmunda regalis*	Osmundaceae
Long-leaf Pine	*Pinus palustris*	Pinaceae
Loblolly Pine	*Pinus taeda*	Pinaceae

Broom-sedge	*Andropogon virginicus*	Poaceae
Cypress Witchgrass	*Dichanthelium dichotomum*	Poaceae
Barnyard Grass	*Echinochloa crus-galli*	Poaceae
Narrow Melic Grass	*Melica mutica*	Poaceae
Long-awn Hairgrass	*Muhlenbergia capillaris*	Poaceae
Smaller Sea-beach Pea	*Panicum amarum*	Poaceae
Warty Panicgrass	*Panicum verrucosum*	Poaceae
Old Switch Panic Grass	*Panicum virgatum*	Poaceae
Slender Paspalum	*Paspalum setaceum var ciliatifolium*	Poaceae
May Grass	*Phalaris caroliniana*	Poaceae
Water Pimpernel	*Samolus valerandi ssp parviflorus*	Primulaceae
Coastal Virgin's-bower	*Clematis catesbyana*	Ranunculaceae
Virginia Virgin-bower	*Clematis virginiana*	Ranunculaceae
Red Chokeberry	*Aronia arbutifolia*	Rosaceae
Larger Button-weed	*Diodia virginiana*	Rubiaceae
Coast Bedstraw	*Galium hispidulum*	Rubiaceae
Blunt-leaf Bedstraw	*Galium obtusum*	Rubiaceae
Hairy Bedstraw	*Galium pilosum*	Rubiaceae
Carolina Willow	*Salix caroliniana*	Salicaceae
Earleaf Greenbrier	*Smilax auriculata*	Smilacaceae
Saw Greenbrier	*Smilax bona-nox*	Smilacaceae
Glaucous-leaved Greenbrier	*Smilax glauca*	Smilacaceae
Laurel-leaf Greenbrier	*Smilax laurifolia*	Smilacaceae
Common Greenbrier	*Smilax rotundifolia*	Smilacaceae
Narrow-leaved Cattail	*Typha angustifolia*	Typhaceae
Broad-leaf Cattail	*Typha latifolia*	Typhaceae
DEVELOPED		
Common Yucca	*Yucca filamentosa*	Agavaceae
Moundlily Yucca	*Yucca gloriosa*	Agavaceae
Winged Sumac	*Rhus copallina*	Anacardiaceae
Poison Ivy	*Toxicodendron radicans ssp radicans*	Anacardiaceae
Sweet Fennel	*Foeniculum vulgare*	Apiaceae
Annual Ragweed	*Ambrosia artemisiifolia*	Asteraceae
Horseweed	*Conyza canadensis var canadensis*	Asteraceae
Spanish Moss	*Tillandsia usneoides*	Bromeliaceae
Eastern Prickly-pear	*Opuntia humifusa*	Cactaceae
Coastal Prickly Pear	*Opuntia pusilla*	Cactaceae
Clasp-leaf Venus'-looking-glass	*Triodanis perfoliata*	Campanulaceae
Japanese Honeysuckle	*Lonicera japonica*	Caprifoliaceae
Eastern Red Cedar	*Juniperus virginiana*	Cupressaceae
Chinese Bushclover	*Lespedeza cuneata*	Fabaceae
White Sweet-clover	*Melilotus albus*	Fabaceae
Spring Vetch	*Vicia sativa*	Fabaceae
Sweet Gum	*Liquidambar styraciflua*	Hamamelidaceae
Forked Bluecurls	*Trichostema dichotomum*	Lamiaceae
Field Garlic	*Allium vineale*	Liliaceae
Red Mulberry	*Morus rubra*	Moraceae
Southern Bayberry	*Myrica cerifera*	Myricaceae

Narrow-leaved Sundrops	*Oenothera fruticosa*	Onagraceae
American Beachgrass	*Ammophila breviligulata*	Poaceae
Broom-sedge	*Andropogon virginicus*	Poaceae
Dune Sandbur	*Cenchrus tribuloides*	Poaceae
Bermuda-grass	*Cynodon dactylon*	Poaceae
Hairy Crabgrass	*Digitaria sanguinalis*	Poaceae
Shaggy Crabgrass	*Digitaria villosa*	Poaceae
Barnyard Grass	*Echinochloa crus-galli*	Poaceae
Annual Bluegrass	*Poa annua*	Poaceae
Kentucky Bluegrass	*Poa pratensis*	Poaceae
Little Bluestem	*Schizachyrium scoparium*	Poaceae
Virginia Virgin-bower	*Clematis virginiana*	Ranunculaceae
Southern Dewberry	*Rubus trivialis*	Rosaceae
Muscadine Grape	*Vitis rotundifolia*	Vitaceae

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Appendix D Sea Turtle Monitoring Protocol

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Camp Lejeune's sea turtle monitoring program documents field work in four elements: 1) nest protection, 2) tagging of adult turtles, 3) nesting data collection, and 4) determination of hatching success. From mid-May through mid-August, approximately 7.0 mi of Onslow Beach are monitored nightly for sea turtle nesting activity generally spanning from 1 mi. north of the Onslow North Tower to the New River Inlet, (UTM 9358289 to 855823). Nesting activity within the northern portion of the beach, 0.7 miles of Onslow Beach and 3.6 miles of Brown's Island (UTM 935829 to 950833), are monitored by aerial surveys conducted twice a week throughout the nesting season.

Nightly Monitoring Procedures:

Addressing Unauthorized Activity

Technicians arrive on the beach by 2200 each night. Cover the headlights of the truck with the red filters before proceeding onto the beach strand. Access the beach from the SOTG access, the ORRV access, or the North Tower access road.

Once on the beach, the first pass should be run close to the high tide line to determine whether a crawl took place after completing the previous night's survey. The first run of the beach also includes identifying unauthorized ORRVs, temporary artificial lighting or other beach activities that may interfere with turtles. Concurrently, the beach is surveyed for crawls and nesting females. Escort any unauthorized ORRV, with headlights turned off, from the beach referring to the appropriate Base Order. Contact the Game Wardens if the driver is not compliant. Address other problematic activities in a similar manner. Approximately 1.5 hours should be allowed for between each North - South pass.

Encountering Nesting Activity

'Data collection is always secondary to successful nesting...'

When a nesting female is encountered, usually spotted by a "crawl" observed in the trucks path, immediately extinguish the headlights and park the truck at a safe distance from the turtle. Record the time the turtle was first spotted and the mileage north or south of Riseley Pier. Carefully approach the turtle, without lights, to determine whether a nesting attempt is in progress. If the turtle is excavating a nest cavity, there will be enough time for data collection. If she is closing the cavity, you will have to move quickly to gather data after marking the egg cavity. Take extreme care so as not startle her. Crawling turtles are not to be disturbed- our activities should not influence the nesting activity. Continue on the pass or wait quietly at some distance until the turtle is either engaged in egg-laying or returning to the surf.

If the turtle begins her return to the surf in an obvious false crawl, determine whether the individual is carrying tags and record any tagging information or identifying characteristics. If the turtle is not carrying tags, attempt to tag her but be prepared to abort the attempt if the activity is obviously stressing the turtle. Using calipers, measure the width of the track at its widest point and record GPS coordinates at the point farthest inland. Do not spend too much time on false crawls as you may miss an actual nest elsewhere on the beach. Keep in mind that the turtle will likely return for another nest attempt or crawl.

If the turtle is in the process of digging a body cavity, she will most likely attempt to nest. Once active egg-laying begins, to save time place a marker (3-4' iron re-bar) at least one foot behind the cavity to indicate the position of the nest once covered. An optimal period during which tags

can be affixed and measurements can be taken is when the turtle has deposited at least one third of her eggs.

Tagging procedures:

1. Prior to patrolling the beach, clean tags of any residue and place them in a sealed plastic bag.
   2) Apply a disinfectant (ie. Betadyne) to the tag and fore flipper prior to tagging.
2. The tag is attached to the trailing edge of the fore flipper between the first and second major scales or through the second major scale. Tags are attached snugly to the flipper so that it doesn't extend too far posterior or too close where it may become imbedded. Both of the front flippers are tagged.
3. Once the tag has been attached, check the tip to be sure it has properly cinched: it should overlap the hole by at least 3mm. If the overlap is insufficient, carefully fit the tag back into the applicator and apply greater pressure. If this is still unsatisfactory, remove and apply another tag. Improperly cinched tags may shed quickly.
4. Record tag numbers if the turtle was previously tagged (recapture) and note any evidence of tag scars.

After the turtle has been tagged or existing tag numbers have been recorded, use the calipers and a tape measure to take carapace measurements. Record the curved carapace length (CCL), the straight carapace length (SCL) the curved carapace width (CCW) and the straight carapace width (SCW). Collect GPS coordinates of the nest position and record the width of the crawl.

Protecting the Nest:

After the turtle has left the nest site mark and protect the nest with a wire cage. Use a five sided 48" x 24" cage with a mesh size of 2" x 4". After determining where the cavity is located place a stick or other marker over it to identify its location. Bury the wire cage 3-6" inches into the sand centered over the nest with the cavity marked with a stick. Use the shovel to dig a trench for the sides of the cage to be buried in and cover with sand to ensure predators will not be able to dig under the cage easily. The protective cage will exclude raccoons and most foxes. However, to deter persistent predators, an apron of extra mesh around the cage, or burying the cage deeper should deter them. When ghost crabs become a significant problem, traps can be used to trap them. The traps should be readily available, stored in the truck.

Number each nest and crawl consecutively starting with the first event of the season as #1 with either an "N" for a nest event or an "FC" for a false crawl preceding the number. Affix a metal tag onto the cage with the nest number, number of eggs if known, species, and date laid and place an Endangered Species sign onto the ocean facing side of the cage. Reflective tape should be affixed on cages in the training or ORRV portions of the beach and all cages should have colored flagging tied to the sides or corners to increase visibility.

Nest Relocation:

Nest relocation should be preformed only when the nest:

- ...is laid in the designated military training area from Riseley Pier southward to Onslow South Tower.
- ..is laid in a high traffic area (i.e. dune crossovers)of the recreational portion of the beach.
- ..is laid below the average high tide line where REGULAR inundation will result in embryonic mortality.
- ...is laid in an area known to be susceptible to erosion (i.e. just north of the washover flat).
- ...is laid under a sloughing escarpment and is subject to being buried too deeply.

How to move a nest:

Do not begin nest relocation until the female has left the site and is crawling back to the surf. Nest relocations must occur within 6 hours of laying or before 0900 of the morning following the nesting event.

Perform the relocation as soon as possible following abandonment of nest site.

Excavate the eggs by hand, NOT with a shovel. Wearing clean rubber gloves gently remove the eggs and place them into the egg cartons. Place egg cartons in Styrofoam box and set in the back of the truck. Note how many eggs were retrieved from the nest as well as noting any broken or abnormal eggs.

Relocate nests as close to the original nest sites as possible. For nests laid in the training portion of the beach, nests should be moved north of the Officers Pavilion. Avoid forming clusters of nests. Concentrating nests in a small area may attract predators and/or alter sex ratios. Nests should be relocated to areas above the high tide line that are relatively free from vegetation to prevent roots from interfering with incubation or emergence.

Excavate the new egg chamber with posthole diggers to the same depth and dimensions of the original nest. Carefully relocate the eggs to the new chamber and then cover them with moist sand excavated from the new nest chamber. Do not allow dry sand to fall into the cavity. Gently pat the surface and smooth the dry sand to a depth similar to what it was prior to excavating the cavity.

Protect and mark the nest location following the steps listed in the nest protection procedures.

Nest Excavation and Analysis:

When to Excavate Nests:

- A minimum of 72hrs. after mass emergence or an 80 day incubation period with no hatchling activity, which ever comes first. If the nest exhibits a trickle hatch then wait a minimum of 120 hrs. after first hatchling emergence or until the majority of all hatchlings have emerged.

- If the nest was subjected to tidal inundation, excessive rainfall, or cool ambient temperatures, wait a minimum of 120hrs. or after 90 days of incubation.

- If you encounter live, vigorous hatchlings before reaching eggshells or find a mix of more than 10 live hatchlings and viable unhatched eggs, quickly cover the egg chamber with moist sand and wait at least 72hrs. before excavating again. Opening and closing a nest can increase the chance of detection by predators; take care in replacing all nest contents and sand into the cavity.

How to excavate nest:

- Always wear latex gloves when excavating a nest.

- Carefully and gently dig in to the nest cavity with your hands. Be aware that live hatchlings may still be in the nest cavity.

- Carefully remove nest contents, separate into piles and record the number of:

  - Live Hatchlings (HA)
  - Dead Hatchlings (DH)
  - Unhatched Eggs (LH) hatchlings
  - Whole Eggshells (>50%) (ES)
  - Pipped eggs w/live hatchlings
  - Pipped eggs w/dead

  Notes: Disregard all eggshell pieces (<50%)
  Keep pipped eggs w/live hatchlings shaded.

Encountering Live Hatchlings

- Release all live fully developed hatchlings after dark in an area void of all artificial lights. Allow the hatchlings to crawl to the water to facilitate natal beach imprinting.

- Rebury pipped eggs with live hatchlings and hatchlings with prominent yolk sacs. Wait at least a week before excavating again and adjust totals (add number of whole eggshells to the **ES** total; dead hatchlings that emerged from the egg but did not leave nest to the **DH** total; and live hatchlings that emerged from the egg but did not leave the nest to the **LH** total).

Cold Weather Hatching Events

If an emergence takes place when temperatures are less than 50 degrees F, gather all hatchlings in a container, bring inside and call the Sea Turtle Project Coordinator.

Rut removal: When obstacles are in the path from the nest to the surf, efforts must be taken to remove that obstacle. Tire ruts from ORRVs and military tactical vehicles are included in the definition of an obstacle. Refer to the Volusia County Beach Habitat Conservation Plan (1996) for a detailed discussion of rut removal practices.

1.) **At 14 days prior to estimated hatching dates, nests will be surveyed for extent and depth of ruts located in the path from the nest to the surf.**
2.) No later than 10 days prior to estimated hatch dates, ruts will be removed and the sand will be smoothed at those nests where multiple ruts are deeper than once inch and longer than one meter.
    - If ruts are located seaward of the vegetation line, a section of chain-link fence or similar smoothing apparatus will be towed across the approximate path of emerging hatchlings, with a minimum width of 15 meters.
    - If rust are located on or near the vegetation line, the ruts will be hand-raked to avoid damage to beach vegtation.
3.) Any holes will be filled and debris removed around those nests due to hatch within a 10-day period.
4.) Daily visits will confirm that no obstacles will impede emerging hatchlings.

How To Report Sea Turtle Strandings:

1.) When on site collect the following information:
    - Date of stranding discovery

- Species
- Sex
- Tagging Information
- GPS coordinates of stranding location
- Carapace measurements and weight if possible
- Description of physical condition including injuries, wounds, or other marks that may indicate a cause of death
- Digital or Polaroid photo of the turtle
- Salvage the carcass or parts of the carcass per request of the Sea Turtle Project Coordinator.

2.) Within 24 hours, call the Sea Turtle Project Coordinator to report all strandings. Have all the above information on hand when phoning in a report.
3.) Fill out the Sea Turtle Stranding and Salvage Network Stranding Report.
4.) If it is a live stranding call the Sea Turtle Project Coordinator for handling instructions and consult the Handbook for Sea Turtles in North Carolina for immediate first aid.

INDIVIDUAL NEST RECORD

CRAWL DATE:_____(for all crawls discovered after midnight, enter the date the crawl was found. For all crawls found/reported before midnight, enter the next day's date.

CRAWL TYPE (circle one):FALSE CRAWL NEST SPECIES:

CRAWL NUMBER:
TREATMENT (circle one): 0 = No treatment 1 = Relocated 2 = Wired in place 3 = Relocated and wired

CRAWL LOCATION:

CRAWL WAS FOUND IN SEA TURTLE NEST MANAGEMENT ZONE

CRAWL LATITUDE_____LONGITUDE
WAYPOINT#

RELOCATED NEST LOCATION:

REL.SITE LATITUDE_____LONGITUDE
WAYPOINT#

REASON FOR MOVING NEST

NUMBER OF EGGS RELOCATED:_____ NEST DEPTH in./cm.

TRANSPONDER BALL BURIED WITH NEST? Y / N TIME NEST WAS MOVED

NEST DISTURBANCES

Enter "Y" if nest was washed by the tide, enter "N" if nest was not washed by the tide for each day of the incubation period.

Day 1 _____	Day 21_____	Day 41 _____	Day 61 _____ Day 81
Day 2 _____	Day 22_____	Day 42 _____	Day 62 _____ Day 82
Day 3 _____	Day 23 _____	Day 43 _____	Day 63 _____ Day 83
Day 4 _____	Day 24 _____	Day 44 _____	Day 64 _____ Day 84
Day 5 _____	Day 25 _____	Day 45 _____	Day 65 _____ Day 85
Day 6 _____	Day 26 _____	Day 46 _____	Day 66 _____ Day 86
Day 7 _____	Day 27 _____	Day 47 _____	Day 67 _____ Day 87
Day 8 _____	Day 28 _____	Day 48 _____	Day 68 _____ Day 88
Day 9 _____	Day 29 _____	Day 49 _____	Day 69 _____ Day 89
Day 10 _____	Day 30 _____	Day 50 _____	Day 70 _____ Day 90
Day 11 _____	Day 31 _____	Day 51 _____	Day 71
Day 12_____	Day 32 _____	Day 52 _____	Day 72
Day 13 _____	Day 33 _____	Day 53 _____	Day 73
Day 14 _____	Day 34 _____	Day 54 _____	Day 74
Day 15 _____	Day 35 _____	Day 55 _____	Day 75
Day 16 _____	Day 36 _____	Day 56 _____	Day 76
Day 17_____	Day 37 _____	Day 57 _____	Day 77
Day 18 _____	Day 38 _____	Day 58 _____	Day 78
Day 19 _____	Day 39 _____	Day 59 _____	Day 79
Day 20 _____	Day 40 _____	Day 60 _____	Day 80

TOTAL NUMBER OF DAYS NEST WAS WASHED OVER

Record of nest disturbances that resulted impartial or total loss of eggs or hatchlings, including loss of nest markers, during the incubation period.

Date	**Type of disturbance**	**Comments(include estimated # of lost eggs/hatchlings**

HATCHING/NEST INVENTORY DATA

Date of first hatchling emergence (if first emergence was seen after midnight, record that day's date. If first emergence was seen before midnight, record the next day's date)

Date of last hatchling emergence (if last emergence was seen after midnight, record that day's date, if last emergence was seen before midnight, record the next day's date)

Nest inventory date:_____ Excavated by:

Perform the following steps to assist with the determination of the nest's hatch success:

1. To obtain number of hatched eggs, separate whole eggshells (>50%) from pieces (<50%); only count whole eggshells (each whole eggshell represents one hatched egg):
   ES =

2. Add together the number of unhatched eggs and pipped eggs with the dead hatchlings to obtain
the total number of unhatched eggs:
   UH =

3. Count the # of dead hatchlings that emerged from eggs but did not leave the nest:
   DH =

4. Count the # of live hatchlings that emerged from eggs but did not leave the nest, irrespective of their condition.
   LH =

*If the nest contains live hatchlings that emerged from the egg shell, but did not leave the next cavity or pipped eggs with live hatchlings, see the volunteer handbook for further instructions.

SEE VOLUNTEER HANDBOOK FOR MORE DETAILED INSTRUCTIONS ON PERFORMING NEXT EXCAVATIONS.

RECORD ANY NEST DISTURBANCES SEEN WHILE PERFORMING THE NEST INVENTORY (e.g., root invasion, fire ant invasion, dead hatchlings that appeared to be trapped by compacted sand, etc.) IN THE NEST DISTURBANCE TABLE ABOVE. Additional comments (e.g., status of embryos among unhatched eggs, etc):

COOPERATIVE MARINE TURTLE TAGGING PROGRAM
TAGGING DATA FORM

SPECIES:_____ **DATE CAPTURED:** **DATE RELEASED:**

TAG NUMBERS (LIST ALL NUMBERS AND LETTER PREFIXES; CIRCLE TAG NUMBERS ALREADY ON THE TURTLE [="OLD TAGS"]:

LEFT FRONT:_____ **RIGHT FRONT:**_____ **LEFT REAR:**_____ **RIGHT REAR:**_____

PIT TAG #: _____ **LOCATION OF PIT TAG:**_____

PIT TAG MANUFACTURER:

WAS TURTLE CARRYING TAGS WHEN ENCOUNTERED?:

TAG RETURN ADDRESS:

ORGANIZATION TAGGING AND/OR RELEASING TURTLE (INCLUDE ADDRESS, AREA CODE/PHONE NUMBER, AND EMAIL):
Fish and Wildlife Branch, MCB Camp Lejeune, Jackson ville, NC 28542 (910) 451-2148

PROJECT TYPE (CIRCLE ONE):

[NESTING BEACH] [TANGLE NET] [TRAWL NET] [POUND NET] [HAND CATCH][STRANDING][OTHER, DESCRIBE]

IF NESTING BEACH: DID TURTLE NEST?

FACILITY WHERE TURTLE WAS BEING HELD:

DESCRIBE CAPTURE LOCATION. BE SPECIFIC, INCLUDE COUNTRY, STATE, COUNTY AND LAT/LONG IF AVAILABLE.

Onslow Beach , MCB, Camp Lejeune, Jacksonville, Onslow County, NC, USA

DESCRIBE RELEASE LOCATION. BE SPECIFIC, INCLUDE COUNTRY, STATE, COUNTY AND LAT/LONG IF AVAILABLE.

Onslow Beach , MCB, Camp Lejeune, Jacksonville, Onslow County, NC, USA

TURTLE

STRAIGHT CARAPCE LENGTH (SCL NOTCH-TIP): _____CM _____INCHES

STRAIGHT CARAPACE LENGTH (SCL MINIMUM):_____ CM _____INCHES

STRAIGHT CARAPACE WIDTH (SCW): _____ CM _____INCHES

CURVED CARAPACE LENGTH (CCL NOTCH-TIP): _____ CM _____INCHES

CURVED CARAPACE LENGTH (CCL MINIMUM): _____ CM _____INCHES

CURVED CARAPACE LENGTH (CCW): _____ CM _____INCHES

WEIGHT: _____ KG _____LB

TURTLE WAS SCANNED FOR AND/OR INSPECTED FOR: (CIRCLE ALL THAT APPLY):

[TAG SCARS] [MAGNETIC WIRES] [LIVING TAGS] [PIT TAGS-GIVE FREQUENCY & SCANNER MANUFACTURER]

IF FOUND, GIVE LOCATION OF:

TAG SCARS: MAGNETIC WIRES: LIVING TAGS

ADDITIONAL REMARKS OR DATA ON BACK OF YES NO

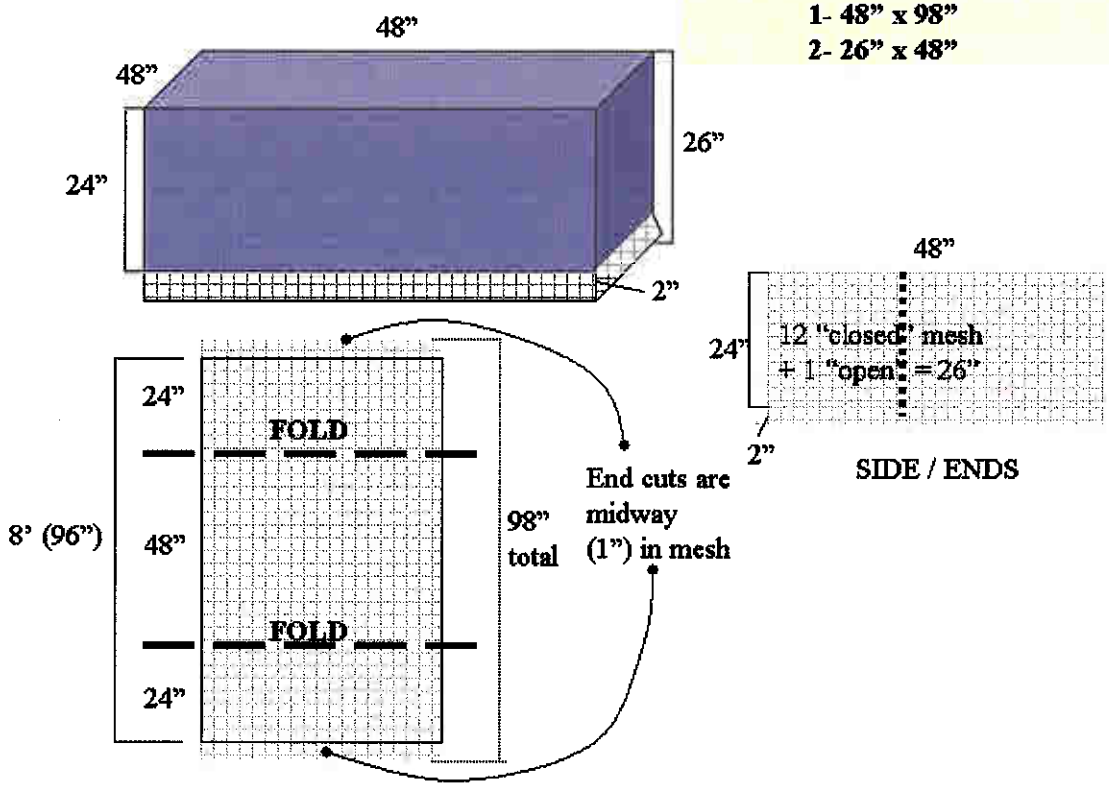
MAIL COMPLETED FORM TO:

ARCHIE CARR CENTER FOR SEA TURTLE RESEARCH, DEPARTMENT OF ZOOLOGY, PO BOX 118525
UNIVERSITY OF FLORIDA, GAINSVILLE, FL 32611

Protective Cages for Sea Turtle Nests:
Marine Corps Base, Camp Lejeune, NC

- One 100' x 4' roll of 12.5 gauge wire with 2" x 4" mesh should produce 8 cages.
- 2" x 4" mesh should lay with 4" side horizontally
- Eight 48" x 98" pieces should be cut first, followed by sixteen 48" x 26" pieces.
    - 96" lengths should have 1" of open mesh on each end.
    - 24" lengths (sides) should have 2" open mesh on bottom.

Each cage is made with 3 pieces:
1- 48" x 98"
2- 26" x 48"



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Appendix E Landscape Architect Renderings of Proposed Development on Onslow Beach

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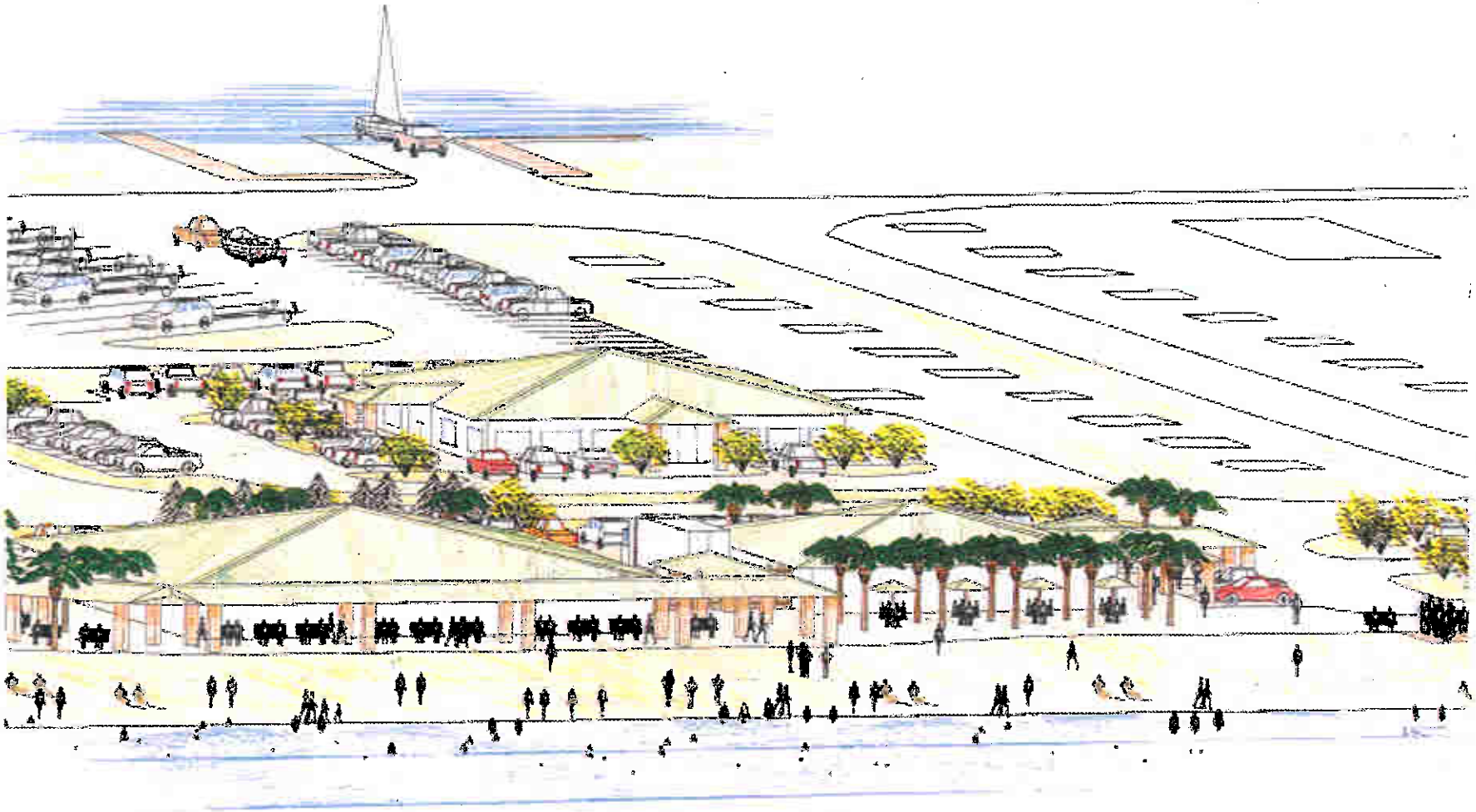
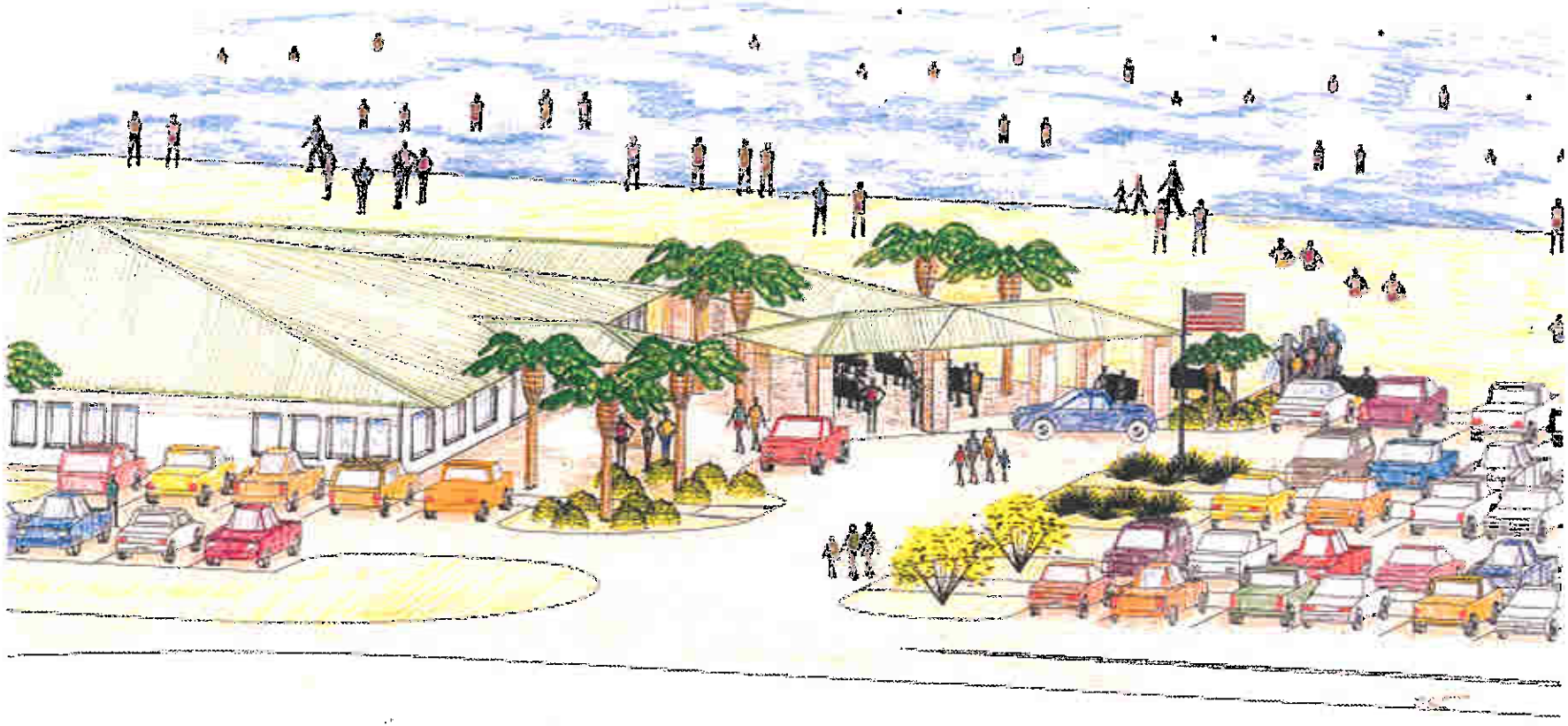
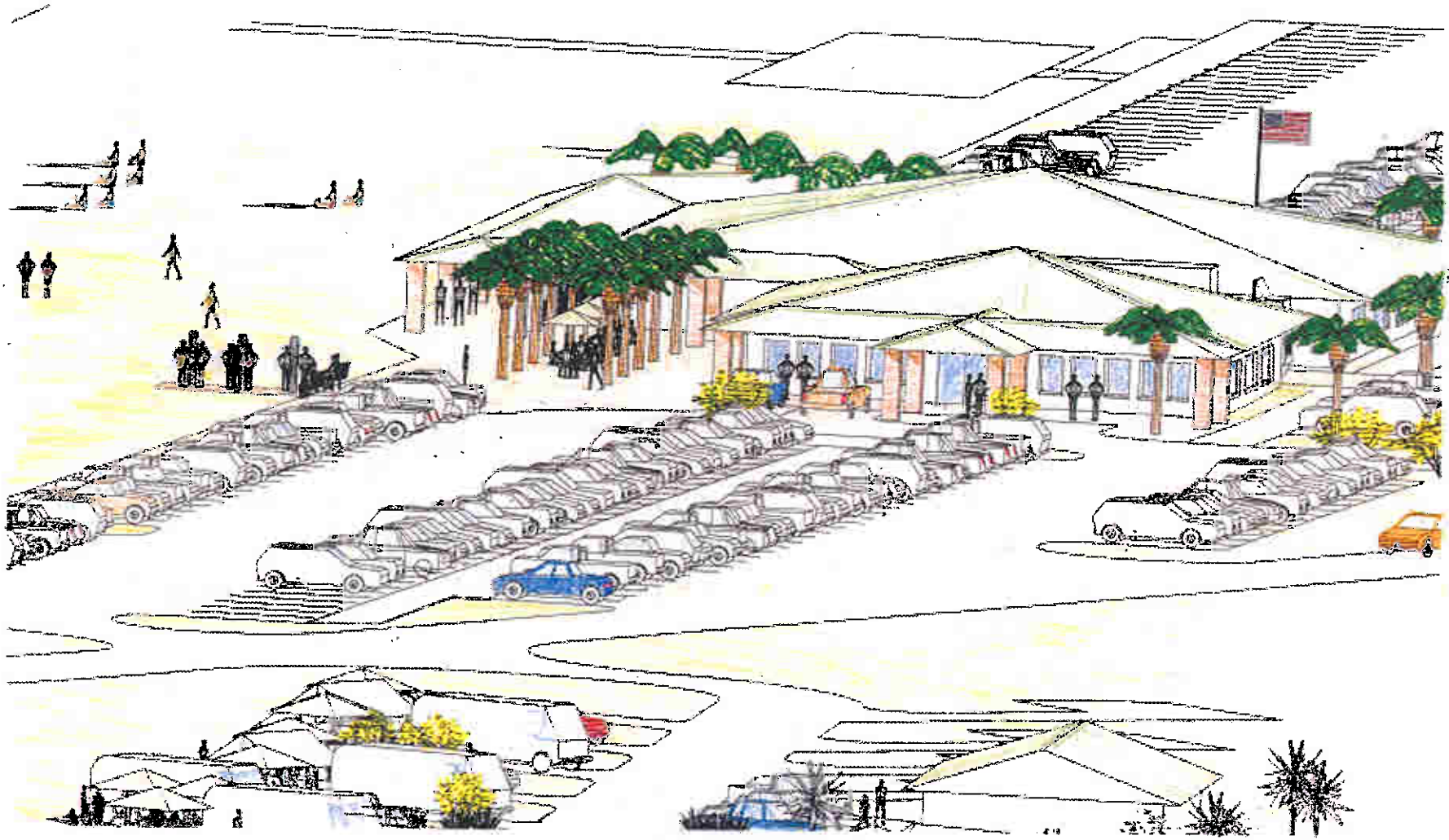


BEACH COMPLEX, RESTAURANT, COMMUNITY CENTER,
BOAT LAUNCH (VIEW FROM SE)



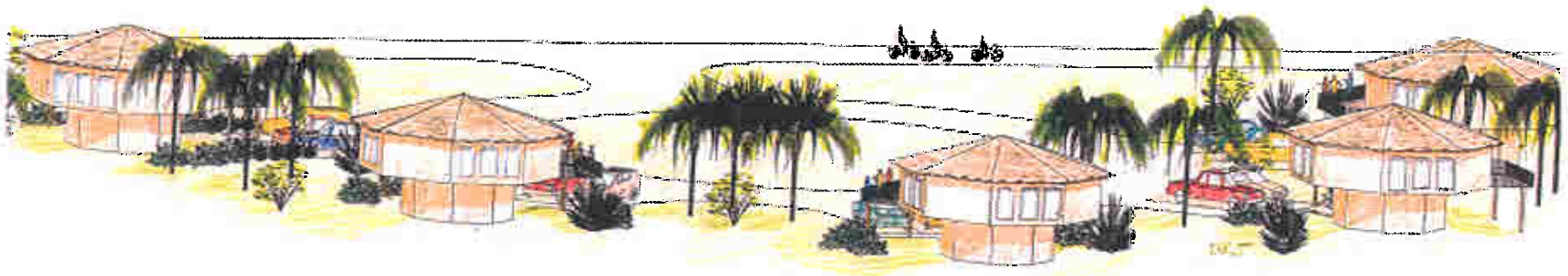
BEACH COMPLEX - MAIN ENTRANCE
(VIEW FROM NW)



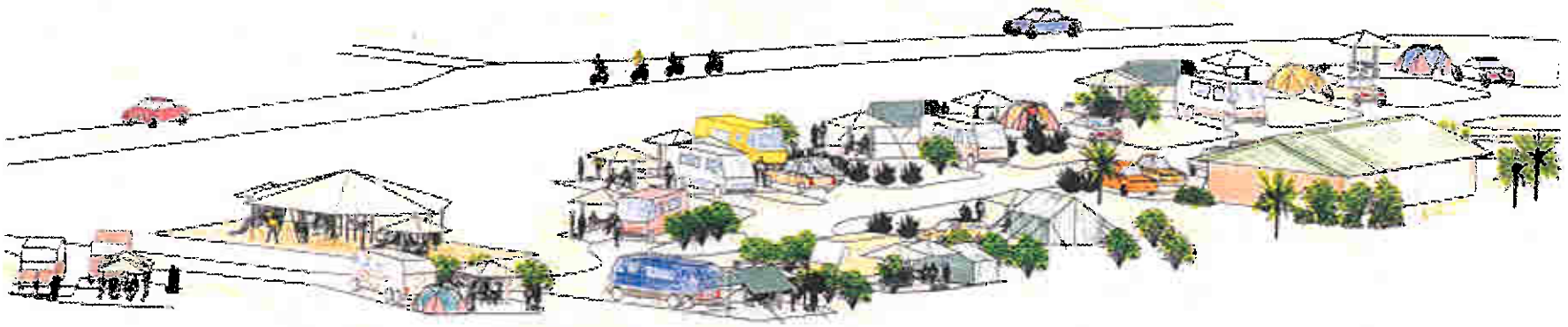
RESTAURANT, BEACH COMPLEX [VIEW FROM NE]

FISHING PIER, PUTT-PUTT GOLF, SHOWER HOUSE, PICNIC SHELTER

SHOWER HOUSE, PICNIC SHELTER, PUTT-PUTT GOLF, HORSE SHOE
BASKET BALL

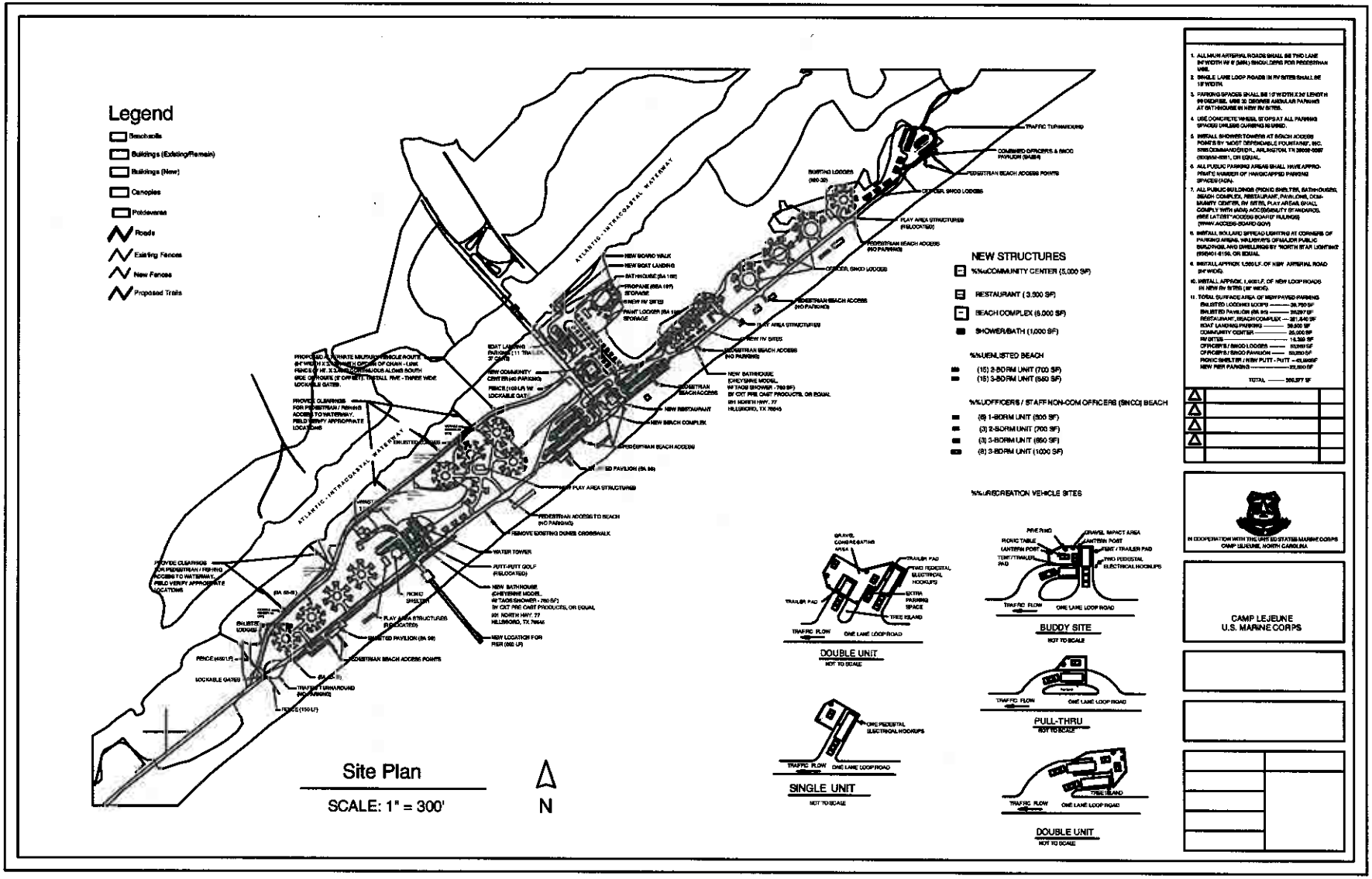


OFFICER/NCO LODGES



RV CAMPING AREA, COVERED PLAY AREA, SHOWER HOUSE

DOUBLE RV CAMPING SPUR


Legend
Beachcrofts
Buildings (Existing/Remain)
Buildings (New)
Canopies
Pole/overse
Roads
Existing Fences
New Fences
Proposed Trails
ATLANTIC - INTRACOASTAL WATERWAY
NEW BOARD WALK
NEW BOAT LANDING
BATHHOUSE (BA 1100)
PROPANE (#BA 197) STORAGE
SHOWER RV SITES
PAINT LOCKER (BA 1100) STORAGE
BOAT LANDING PARKING (11 TRAILER SPACES)
NEW COMMUNITY CENTER (40 PARKING)
FENCE (100 LF) W LOCKABLE GATE
NEW RESTAURANT
NEW BEACH COMPLEX
PEDESTRIAN BEACH ACCESS
ENLISTED PAVILION (BA 99)
PLAY AREA STRUCTURES
PEDESTRIAN ACCESS TO BEACH (NO PARKING)
REMOVE EXISTING DUNES CROSSWALK
WATER TOWER
PUTT-PUTT GOLF (RELOCATED)
NEW BATHHOUSE (CHEYENNE MODEL W/ TACKS SHOWER) - 760 SF)
BY CKT PRE CAST PRODUCTS, OR EQUAL
601 NORTH HWY. 77
HILLSBORO, TX 76645
NEW LOCATION FOR PIER (682 LF)
PICNIC SHELTER
PLAY AREA STRUCTURES (RELOCATED)
ENLISTED PAVILION (BA 99)
PEDESTRIAN BEACH ACCESS POINTS
FENCE (4400 LF)
LOCKABLE GATES
TRAFFIC TURNAROUND (NO PARKING)
FENCE (150 LF)
ENLISTED LODGING
OFFICER, SNCO LODGES
COMBINED OFFICERS & SNCO PAVILION (BA#99)
PROPOSED PRIVATE MILITARY SINGLE ROUTE (64" WIDTH X 2" THICK) (2 FEET OF CHAIN - LINK FENCE (6' HT. X 3.5' WIDE) CONTINUOUS ALONG SOUTH SIDE OF ROUTE (5' OFF SET) INSTALL RVE - THREE WIDE LOCKABLE GATES.
PROVIDE CLEARINGS FOR PEDESTRIAN / REPIRO ACCESS TO WATERWAY; FIELD VERIFY APPROPRIATE LOCATIONS
PROVIDE CLEARINGS FOR PEDESTRIAN / REPIRO ACCESS TO WATERWAY; FIELD VERIFY APPROPRIATE LOCATIONS
Site Plan
SCALE: 1" = 300'
N
NEW STRUCTURES
%%uCOMMUNITY CENTER (5,000 SF)
RESTAURANT (3,500 SF)
BEACH COMPLEX (6,000 SF)
SHOWER/BATH (1,000 SF)
%%UENLISTED BEACH
(16) 2-BDRM UNIT (700 SF)
(16) 3-BDRM UNIT (560 SF)
%%UOFFICERS / STAFF NON-COM OFFICERS (SNCO) BEACH
(6) 1-BDRM UNIT (500 SF)
(3) 2-BDRM UNIT (700 SF)
(3) 3-BDRM UNIT (950 SF)
(6) 3-BDRM UNIT (1000 SF)
%%URECREATION VEHICLE SITES
GRAVEL CONGREGATING AREA
TRAILER PAD
TWO PEDESTAL ELECTRICAL HOOKUPS
EXTRA PARKING SPACE
TREE ISLAND
TRAFFIC FLOW
ONE LANE LOOP ROAD
DOUBLE UNIT
NOT TO SCALE
ONE PEDESTAL ELECTRICAL HOOKUPS
SINGLE UNIT
NOT TO SCALE
FIRE RING
PICNIC TABLE
LANTERN POST
TENT / TRAILER PAD
GRAVEL IMPACT AREA
BUDDY SITE
NOT TO SCALE
PULL-THRU
NOT TO SCALE
DOUBLE UNIT
NOT TO SCALE
1. ALL MAIN ARTERIAL ROADS SHALL BE TWO LANE (24' WIDTH W 6' (MIN.) SHOULDERS FOR PEDESTRIAN USE.
2. SINGLE LANE LOOP ROADS IN RV SITES SHALL BE 18' WIDTH.
3. PARKING SPACES SHALL BE 10' WIDTH X 24' LENGTH IN DIAGONAL USE 30' DRIVING AISLE (ALL PARKING AT BATHHOUSE IN NEW RV SITES.
4. USE CONCRETE WHEEL STOPS AT ALL PARKING SPACES UNLESS CURBING IS USED.
5. INSTALL SHOWER TOWERS AT BEACH ACCESS POINTS BY "MOST DEPENDABLE FOUNTAINS", INC. 5785 COMMANDER DR., ARLINGTON, TN 38002-5097 (901)(844-1581), OR EQUAL.
6. ALL PUBLIC PARKING AREAS SHALL HAVE APPROPRIATE NUMBER OF HANDICAPPED PARKING SPACES (ADA).
7. ALL PUBLIC BUILDINGS (PICNIC SHELTER, BATHHOUSES, BEACH COMPLEX, RESTAURANT, PAVILIONS, COMMUNITY CENTER, RV SITES, PLAY AREAS, ETC.), COMPLY WITH (ADA) ACCESSIBILITY REQUIRED, (SEE LATEST "ACCESS BOARD" RULINGS) (WWW.ACCESS-BOARD.GOV)
8. INSTALL BOLLARD SPREAD LIGHTING AT CORNERS OF PARKING AREAS, WALKWAYS, OR MAJOR PUBLIC BUILDINGS, AND DWELLINGS BY "NORTH STAR LIGHTING" (RANCH 6156), OR EQUAL.
9. INSTALL APPROX 1,500 LF. OF NEW ARTERIAL ROAD (24' WIDE).
10. INSTALL APPROX 1,400 LF. OF NEW LOOP ROADS IN NEW RV SITES (18' WIDE).
11. TOTAL SURFACE AREA OF NEW PAVED PARKING
ENLISTED LODGING LOOPS — 26,750 SF
ENLISTED PAVILION (BA 99) — 35,297 SF
RESTAURANT, BEACH COMPLEX — 27,340 SF
BOAT LANDING PARKING — 38,500 SF
COMMUNITY CENTER — 25,000 SF
RV SITES — 14,350 SF
OFFICERS / SNCO LODGES — 10,000 SF
OFFICERS / SNCO PAVILION — 10,250 SF
PICNIC SHELTER / NEW PUTT - PUTT — 45,000 SF
NEW PIER PARKING — 23,500 SF
TOTAL — 300,377 SF
IN COOPERATION WITH THE UNITED STATES MARINE CORPS CAMP LEJEUNE, NORTH CAROLINA
CAMP LEJEUNE
U.S. MARINE CORPS

Appendix C

Agency Correspondence

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

December 19, 2005

Scott A. Brewer
Environmental Management
Marine Corps Base Camp Lejeune
PSC Box 20004
Camp Lejeune, NC 28542-0004

RE: Final Programmatic Environmental Assessment (PEA) for Onslow Beach Master Plan, Marine Corps Order P5090.2A, Camp Lejuene, Onslow County, CH 05-2418

Dear Mr. Brewer:

Thank you for your letter of November 22, 2005. We have reviewed the information related to this project and offer the following comments.

Archaeological site 31ON1246 is apparently the site, referenced in the PEA, which experienced some periods of erosion from storms. TRC Garrow conducted data recovery excavations at this site in 2004 and 2005. Given the results of the excavations and the adverse impacts of Hurricane Ophelia, it was determined that the site is not eligible for inclusion on the NRHP. Based on the documentation presented by your staff and conversations with Mr. Richardson, we concur with the PEA that there will be no effect on significant cultural resources.

We strongly recommend that the draft report related to the data recovery excavations at 31ON1246 be submitted to us as soon as possible for review and comment. We will not be able to comment on or provide clearance for any future undertakings proposed for the specific area encompassed by this work until we have reviewed the report.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

Peter Sandbeck

cc: Rick Richardson, Camp Lejeune

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-4763/733-8653
RESTORATION	515 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6547/715-4801
SURVEY & PLANNING	515 N. Blount Street, Raleigh, NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6545/715-4801