

6/16/2020

National Oceanic and Atmospheric Administration Mail - RE: Green turtle critical habitat



Jennifer Schultz - NOAA Federal <jennifer.schultz@noaa.gov>

RE: Green turtle critical habitat

Bookless CIV Lance <lance.bookless1@usmc.mil>
To: Jennifer Schultz - NOAA Federal <jennifer.schultz@noaa.gov>

Wed, Oct 14, 2015 at 3:30 PM

Hi Jennifer-

Attached are the Fact Sheets from our current INRMP (2012-2016) for the Hawaiian monk seal and Green Sea turtle. We have initiated the update of the current version of our INRMP; one of the updates will be to more clearly identify the conservation measures we implement to protect and ensure the survival of the monk seal and sea turtles. Even though the Fact sheet for the Green sea turtle does not clearly identify our conservation measures, we utilize the same protocols and a variety of management activities to protect and aid in the conservation of the Green sea turtle as we do for the Hawaiian monk seal and Olive Ridley sea turtle.

Since 2009, we have documented 11 Green and Olive Ridley sea turtles coming ashore to rest or nest. Some not recorded have been observed in the water within our 500 yd line. The most recent successful nesting of a Green sea turtle occurred in June 2015 on our eastern shoreline (Ft Hase) that adjoins Kailua Bay. We notified both FWS (Joy Browning) and NOAA (George Balaz) about the nests. Joy came out and conducted a survey of the nesting location; unfortunately we were unable to witness the hatching. However, we know a hatching occurred as our Federal Conservation Enforcement Officer found a dead hatchling (given to NOAA for DNA testing) and rescued a live hatchling a couple days later in vicinity where we believe the nesting occurred. We did see evidence of past nesting activity along the shoreline area in the same general vicinity as the one that recently nested.

If you have any questions, please give me call.

Regards,
Lance Bookless
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6/16/2020

National Oceanic and Atmospheric Administration Mail - RE: Green turtle critical habitat

—Original Message—

From: Jennifer Schultz - NOAA Federal [mailto:jennifer.schultz@noaa.gov]
Sent: Wednesday, October 14, 2015 3:50 AM
To: Bookless CIV Lance
Cc: AnnMarie Lauritsen
Subject: Green turtle critical habitat

Hi Lance,

My name is Jenny Schultz, and I work for the National Marine Fisheries Service (NMFS). Together with US Fish and Wildlife Service, we are starting the critical habitat designation process for green sea turtles (we just proposed 11 DPSS for listing under the Endangered Species Act).

The Pacific Islands Regional Office of NMFS gave me your name as someone who may have spatial information on green turtles: for example, where they nest, forage, or migrate. Also, I was wondering if you may know of any Integrated Natural Resources Management Plans (INRMPs) that include green turtles. Under the Endangered Species Act, the Services do not designate critical habitat on DoD areas where we conclude that an INRMP provides a benefit to the species:

(B)(i) The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation (16 U.S.C. 1533(a)(3)(B)(i)).

Please let me know if you have any data or INRMPs that we should consider when identifying areas important to green turtles.

Thank you,

Jenny
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Endangered Species Division
Office of Protected Resources
NOAA Fisheries
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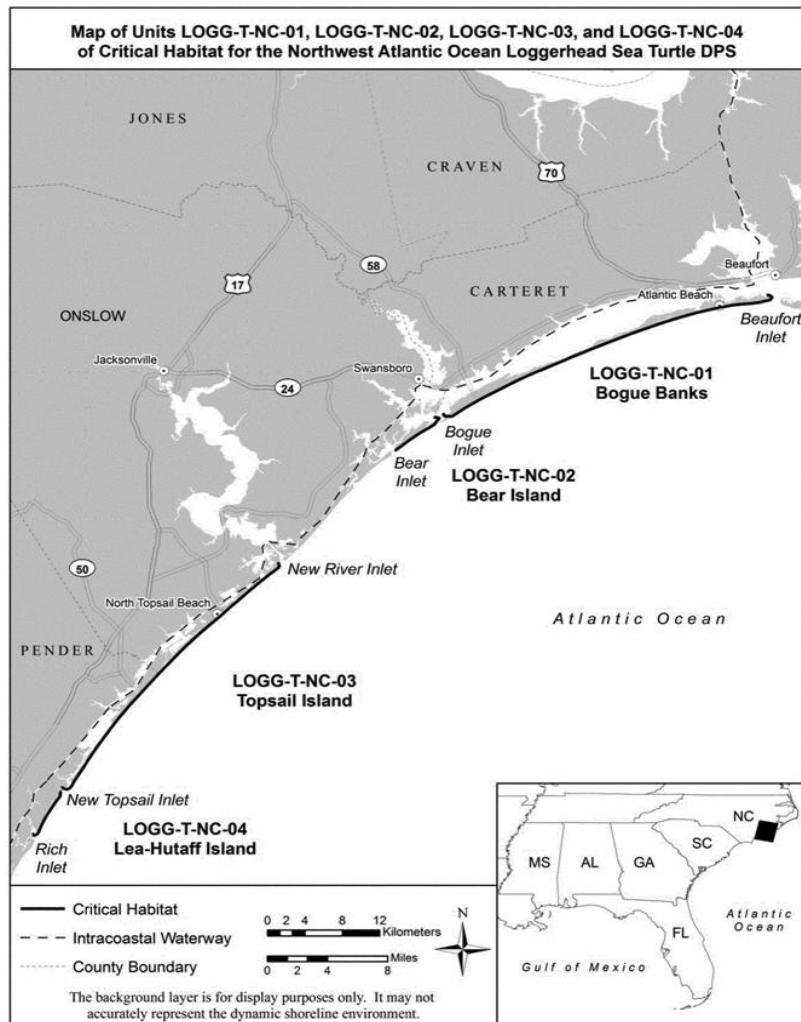
2 attachments

 **Pages from 2011 Final MCB Hawaii INRMP Appendices-2.pdf**
467K

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6K

Appendix 9: Sea Turtle Monitoring, Management and Protective Measures

The following document, with minor edits regarding referencing the 2007 Marine Corps Base Camp Lejeune Integrated Natural Resources Management Plan, sent to the USFWS on October 25, 2012, describes measures MCB Camp Lejeune will take to monitor, manage for, and protect sea turtle nests on Onslow Beach. These measures were determined by the USFWS to be sufficient to exempt Onslow Beach from critical habitat designation. This exemption is described in Federal Register document 74 FR 39755 – 39854 of July 10, 2014, “Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northwest Atlantic Ocean Distinct Population Segment of the Loggerhead Sea Turtle.” Browns Island was not considered in the original proposal to designate critical habitat, and is therefore not specifically mentioned in the exemption. However the installation was exempted as a whole, and the mapped critical habitat units do not include Onslow Beach or Browns Island. The map below is taken from 74 FR 39755-39854. MCB Camp Lejeune’s two barrier islands are located between New River Inlet and Bear Inlet.



PROTECTION, MONITORING, AND MANAGEMENT OF LOGGERHEAD SEA TURTLES ON ONSLOW BEACH, MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE, CAMP LEJEUNE

The purpose of this document is to outline protective measures, monitoring and management actions carried out to promote conservation and recovery of sea turtles on Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ). With the recent designation of the Northwest Atlantic Distinct Population Segment of the loggerhead turtle, and listing as threatened, there is a requirement to designate critical habitat. The National Defense Authorization Act of 2004 allows for military lands to be granted an exemption from the designation of critical habitat for endangered species, provided that there is an Integrated Natural Resources Management Plan (INRMP) in place that provides a sufficient benefit to threatened and endangered species. This document will lay out the measures that MCIEAST-MCB CAMLEJ believe are sufficient to exempt the base from critical habitat designation. As MCIEAST-MCB CAMLEJ begins the process of revising our INRMP, we plan to continue the existing measures for sea turtles described below in the new INRMP.

This document has been organized in a way that addresses specific issues brought up by U.S. Fish and Wildlife Service Sea Turtle Biologist, Anne Marie Lauritsen in e-mails and telephone conversations with MCIEAST-MCB CAMLEJ biologists, Craig Ten Brink. The information below is intended to be a summary of our monitoring and protective measures. For more detailed descriptions of particular aspects of the program, MCIEAST-MCB CAMLEJ can provide the pertinent documents. More detail on the sea turtle protocol can be found in the Handbook for Sea Turtle Volunteers in North Carolina (NRCS, 2006).

Daily Sea Turtle Nest Season Monitoring

Sea turtle nesting has been monitored on Onslow Beach since 1979. The approximately 7 miles of Onslow Beach are monitored on the ground, while approximately 4 miles of Browns Island is monitored by air (Figure 1).

- From mid May through August, Base personnel conduct morning surveys on Onslow Beach every day, including weekends and holidays.
- Surveys begin before sunrise.
- When a crawl is encountered, Base personnel determine whether the crawl is a false crawl, or a nest, and fill out an Individual Crawl Report provided by the North Carolina Sea Turtle Project (Appendix A). Data sheets are submitted online through the North Carolina Sea Turtle Project's page on Seaturtle.org.
- Locations of nests are GPSed, marked, and protected with cages to prevent predation, and increase visibility to people using the beach.

- When military training is to take place on the beach at night, Base personnel will conduct periodic surveys during the duration of the training activity. If a crawl is encountered the same data described above is collected.
- If a nesting female is encountered during night surveys, Base personnel will allow the turtle to nest. Once nesting is in progress (at least 1/3 of eggs deposited) Base personnel will record individual tagging and size data, and allow for immediate protection of sea turtle nests. If the turtle is not tagged, Base personnel will tag the turtle using approved procedures.
- If a nest is laid in the amphibious training beach, below the high tide line, or in an area likely to be frequently inundated or eroded, the nest is relocated to a safe area. Nests found in the amphibious landing beach are relocated north of the recreational beach. Nest relocations are carried out in accordance with existing guidelines adapted from the Handbook for Sea Turtle Volunteers in North Carolina (NRCS, 2006).
- All nests are relocated no later than 9:00 a.m. the morning after eggs are deposited.
- Nests are excavated, and hatchlings are handled in accordance with guidelines in the Handbook for Turtle Volunteers in North Carolina (NRCS, 2006).

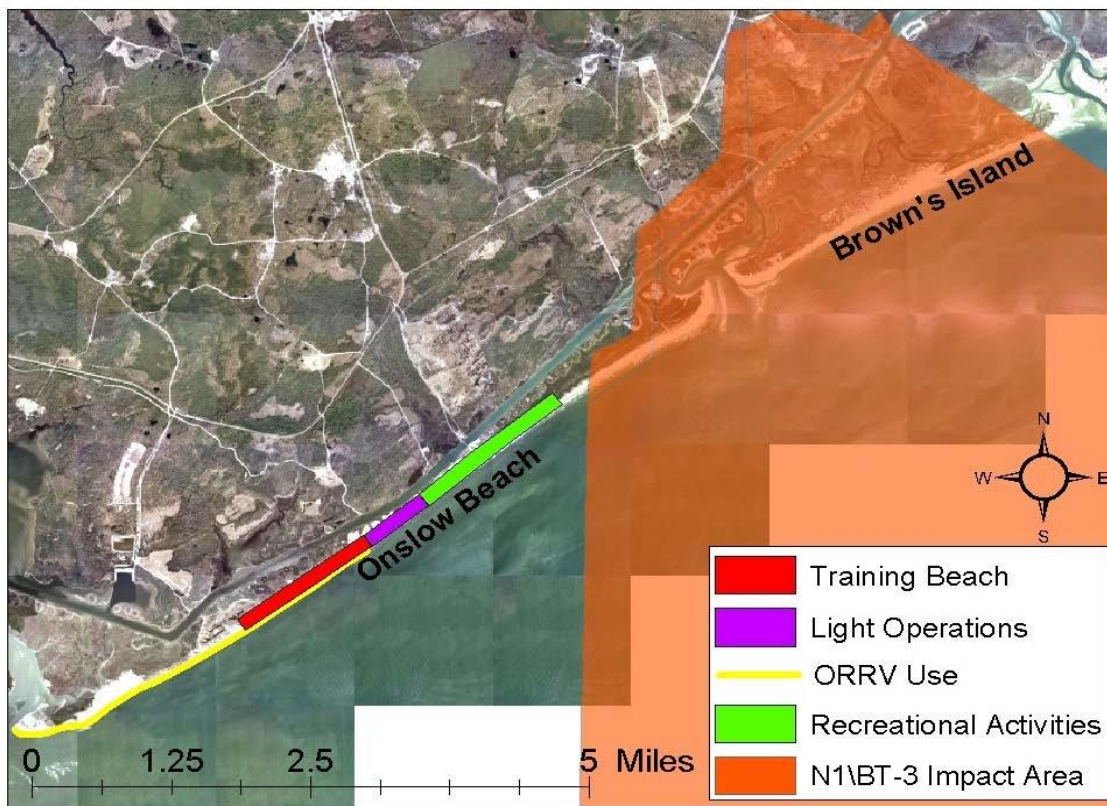


Figure 1. Map of Onslow Beach showing training recreational and special use areas.

Predator Control

Predation of turtle nests has periodically spiked, but in general has not been a major problem for Onslow Beach. In 2012, two nests out of 52 total nests (3.8%) were predated before they were located by Base personnel. A total of 57 eggs were lost; 12 from one nest, and 45 from another. No nests were predated after cages were installed.

In our 2007 INRMP, we stated in regards to shorebirds, that MCIEAST-MCB CAMLEJ has “actively removed predators from Onslow Beach, and will do so again as appropriate.” Since 2008, MCIEAST-MCB CAMLEJ has trapped every year but 2012 on Onslow Beach. Table 1 shows the predators removed from 2008-2011.

MCIEAST-MCB CAMLEJ maintains a contract with U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS) in order to control nuisance animals throughout the base. This contract is flexible, and allows wildlife managers to direct trapping efforts where it is needed most, including control of predators on Onslow Beach for the purpose of promoting conservation of sea turtles, shorebirds, and colonial nesting waterbirds.

In her email, Ms. Lauritsen suggested that we describe what would trigger predator control to minimize sea turtle predation, and suggested that we use Action 411 in the 2008 Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle as a guide. The goal of this action is to reduce the annual rate of mammalian predation to at or below 10% of sea turtle nests. Until now, mobilizing the trapping effort on Onslow Beach has not been triggered by an absolute number or percentage of nests, but MCIEAST-MCB CAMLEJ will begin using 10% as a trigger and will incorporate this into the revised INRMP.

Table 1. Predators trapped on Onslow Beach from 2008-2011

YEAR	OPOSSUM	RACCOON	BOBCAT	FERAL CAT	GRAY FOX
2008	21	1	0	3	2
2009	22	5	0	1	2
2010	32	8	4	0	0
2011	10	2	0	0	0

Education

Because Onslow Beach is a location for both military use and recreational use, MCIEAST-MCB CAMLEJ has developed educational materials targeted for Marines training in the field and patrons of the recreational beach.

Marine units using the Amphibious Landing portion of Onslow Beach must have a Range Safety Officer (RSO), who has gone through the Base's RSO course. Among other things, the RSO course includes sections on threatened and endangered species, and specifically sea turtles. Range Safety Officers are made aware of the potential presence of sea turtles during the nesting season, and the restrictions that are imposed on training. Training restrictions are based on conservation measures and terms and conditions of the 2002 Biological Opinion on the Effects of Current Use and Modification of Training Areas, Dune Stabilization, and Continued Recreational Use of Onslow Beach. These training restrictions have been incorporated into two MCIEAST-MCB CAMLEJ Orders, which all training units must comply with.

For recreational users of Onslow Beach, educational materials on sea turtles are provided in each of the beach rental units, and posters are hanging at each of the three "pavilions" on the beach. The pavilions house rest rooms, vending machines and covered picnic areas.

Predator proof trash receptacles

Predator-proof trash receptacles are not currently being used on Onslow Beach. However if use of this type of receptacle is necessary to meet the requirements of exemption from critical habitat designation, MCIEAST-MCB CAMLEJ will implement their use before next nesting season.

Lighting

MCIEAST-MCB CAMLEJ is committed to reducing and keeping lighting on Onslow Beach to acceptable levels for sea turtles. The 2002 Biological Opinion included a term and condition stating that "Exterior lights on all beach housing units will be converted to canister down lights or other system that reduce ambient light to acceptable levels. In addition, the 2002 Biological Assessment included the following conservation measure:

"Lighting on all new structures built on Onslow Beach will conform to guidelines contained in the Florida Marine Research Institute's Technical Reports on Understanding, Assessing and Resolving Light Pollution Problems on Sea Turtle Nesting Beaches (Witherington and Martin, 2000). Existing structures on Onslow Beach, as well as Risley Pier, will be evaluated for compliance with these standards within six months of receipt of a biological opinion."

Since receiving the 2002 Biological Opinion, MCIEAST-MCB CAMLEJ has converted all lighting on beach housing units to canister lights (Figure 2). In addition, all street lights on Onslow Beach have been converted to low-pressure sodium fixtures, which emit a wavelength that is less attractive to loggerheads. This action went beyond the requirements of the Biological Opinion. As discussed with Ms. Lauritsen, MCIEAST-MCB CAMLEJ will conduct a nighttime survey to determine if any of the street light bulbs are visible from the beach. If so, MCIEAST-MCB CAMLEJ will submit a plan for USFWS approval that addresses the remaining problem lights. Finally, the demolition of Risley Pier has undoubtedly improved the lighting situation for sea turtles on Onslow Beach.

For future facilities, projects are directed to the attention of the Threatened and Endangered Species Program Manager through the National Environmental Policy Act (NEPA) environmental review process. Any new facilities will be required to conform to the Witherington and Martin (2000) guidelines. The Threatened and Endangered Species Program Manager takes an active role working with project proponents to come up with a lighting system that meets the needs of the project, but is sea turtle friendly.



Figure 2. Onslow Beach housing unit showing canister lighting.

Recreational Driving

At the time of the 2002 Biological Opinion, MCIEAST-MCB CAMLEJ allowed off-road recreational driving on Onslow Beach from the former Risley Pier location southwest to the New River Inlet year round, with a prohibition on night driving during the sea turtle nesting season (May 15 - October 31).

In 2005 the base order addressing driving on Onslow Beach was revised to further restrict recreational driving on Onslow Beach. The revised base order restricts driving during the sea turtle nesting season to only training beach during daylight hours, when training is not scheduled. The rationale behind this decision was that sea turtle nests are already being relocated from the training beach, and therefore, recreational driving in this area would not threaten nests or hatchlings. The restriction to daylight hours ensures that Base personnel can find nests in the training beach before recreational users arrive on the beach. Figure 3 shows the different beach sections and when (if) recreational driving is allowed in each.

Conclusion

Based on the information above, we believe it is clear that Onslow Beach is, and will continue to be a high quality nesting beach for the loggerhead sea turtle. In addition to doing what is legally required, MCIEAST-MCB CAMLEJ has sought out ways to improve nesting habitat on Onslow Beach. Several of the measures described above, including conversion of street lights to low-pressure sodium, restriction of recreational driving to the training beach only during the sea turtle nesting season, and the predator trapping efforts go above and beyond the requirements of past

biological opinions, but were seen as good ways to improve stewardship in support of the military mission. In addition to these measures, MCIEAST-MCB CAMLEJ will conduct a nighttime survey of streetlights and submit a plan to the USFWS to address any lights where the bulb is visible from the beach.

It is essential to the military training mission of MCIEAST-MCB CAMLEJ that Onslow Beach is not designated as critical habitat for the loggerhead sea turtle. We believe that the measures described above, and which will be incorporated into the revision of our INRMP offer sufficient protection to the loggerhead to justify exempting Onslow Beach from critical habitat designation, and we seek USFWS concurrence on this matter.

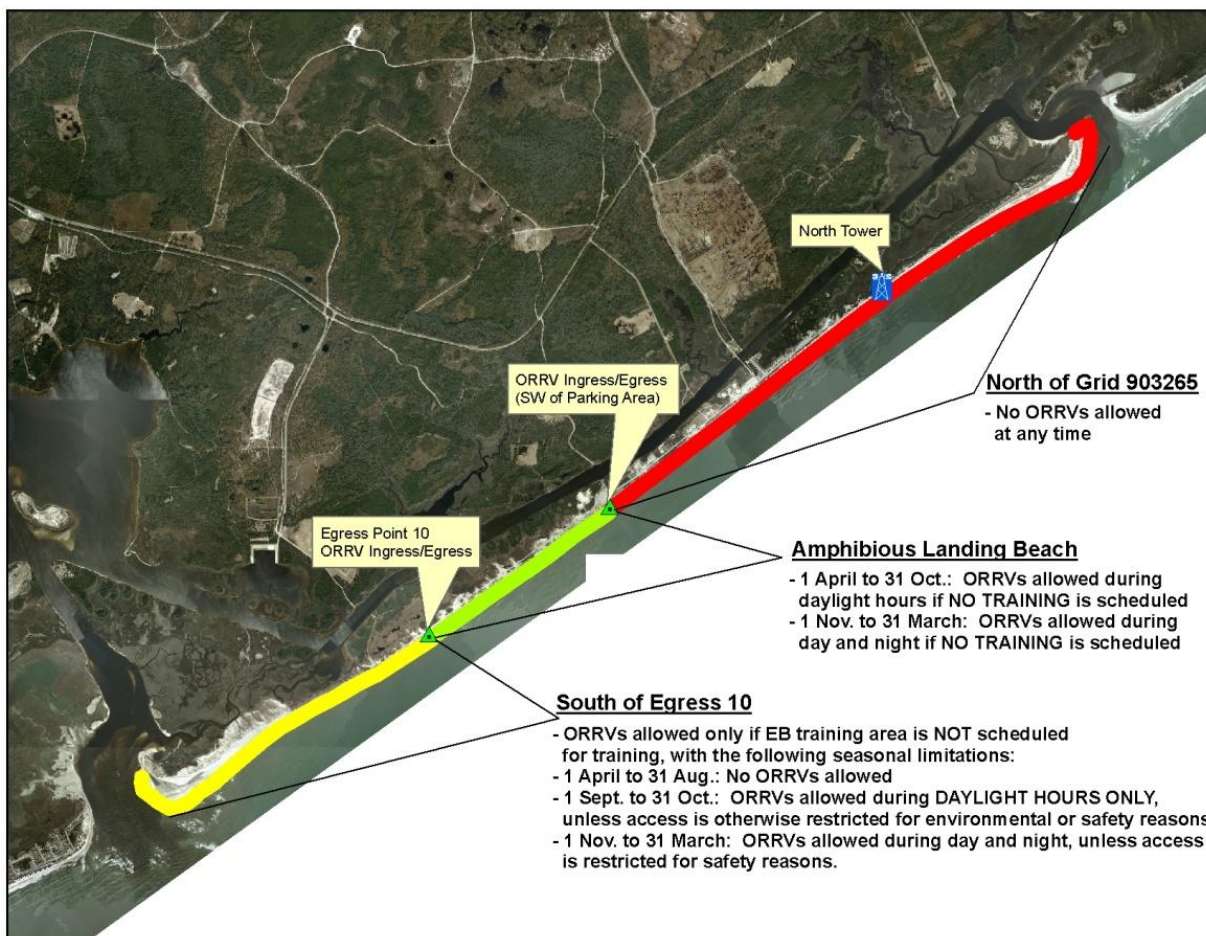


Figure 3. Schedule and locations for recreational driving on Onslow Beach.

References

North Carolina Wildlife Resources Commission (NCWRC). March, 2006. Handbook for Sea Turtle Volunteers in North Carolina. Coastal Faunal Diversity Program, Raleigh, North Carolina. Available at:
http://www.seaturtle.org/PDF/NCWRCNorthCarolinaWildlifeResourcesCommission_2006_HandbookforseaturtlevolunteersinNor.pdf.

Appendix 10. Mitigation and Monitoring for Marine Mammals and Sea Turtles

The USMC and NMFS' Permits and Conservation Division have proposed the following mitigation and monitoring measures designed to avoid take of marine mammals and sea turtles during its training activities. NMFS' ESA, Interagency Cooperation Division's concurrence with a may affect, not likely to adversely affect determination is contingent on the following measures being implemented:

- Compliance with MCB Camp Lejeune 's Integrated Natural Resources Management Plan
- N-1/BT-3 Impact Area Monitoring — Monitoring of the N-1/BT-3 Impact Area will be conducted by Protected Species Observers (PSOs) with binoculars stationed in two towers (Bear and North Onslow) positioned at the land based targets, as described in MCB Camp Lejeune's Standard Operating Procedures. These towers allow for monitoring of waters surrounding the target. When operations are conducted at night, PSOs will monitor the N-1/BT-3 impact area with the use of night-vision goggles. Should a marine mammal or sea turtle be sighted within a firing area, operations will be suspended until the animals have left the area or have not been resighted within 15 minutes.

Firing of any small arms up to 50 cal and 40 mm inert practice rounds, direct fire 155 mm HE and Stinger missiles will be delayed should a marine mammal be sighted within the N- 1/BT-3 impact area. Additionally, firing from small vessels to land would be delayed should a marine mammal be present in a 500 m wide area between the vessel and the land housing the targets.

- Aerial Sweep — Prior to commencing live fire exercises in the N-1/BT-3 impact area and H-Range, an air sweep will be conducted to ensure there are no marine mammals or sea turtles in the impact area. Flyovers will be flown at 227 m (750 ft) and consist of at least two survey lines 2 nautical miles apart and parallel to the coast, with the first line 1.6-3.2 km (1-2 miles) off the beach, and the second 4.8-6.4 km (3-4 miles) off the beach. If a marine mammal or sea turtle is spotted in the N-1/BT-3 impact area, the Environmental Management Division must be notified and firing cannot commence until the animal clears the impact area. All aircrew that conduct range sweeps shall receive training on identification of marine mammals and procedures for collecting and reporting data.

All marine mammal and sea turtle sightings associated with range sweeps shall be documented by noting date, time, number, species, location, and direction. Any action taken related to suspension of training activities will be noted. If no marine mammal or

other protected species (e.g., sea turtles) are sighted, a negative report shall be submitted with all of the above information except species data.

- ICWW and New River Monitoring — The USMC will include monitoring for marine mammals in the ICWW and New River during vessel surveys designed to detect non-military vessels or citizens within water restricted areas. The Marine Corps blocks north and south bound vessel traffic in the ICWW during training events. Vessels stationed at these closure points will also monitor for marine mammals and relay any sightings to the commanding officer in charge of implementing training delay mitigation measures.

In addition to vessel-based PSOs, PSOs would be present in two towers positioned at the land based targets, as described in MCB Camp Lejeune's Standard Operating Procedures. These towers allow for monitoring of waters surrounding the target. Should a marine mammal or sea turtle be sighted within a firing area, operations will be suspended until the animals have left the area or have not been resighted within 15 minutes.

- Special Measures to Protect Right Whales — From 1 November through 30 April, when North Atlantic right whales may be present along the North Carolina coast, Range Control will issue the following daily warning order to training personnel:

Endangered North Atlantic right whales migrate along the North Carolina coast enroute to and from New England areas. Primarily Spring through Fall, and Georgia/Florida calving areas used during winter. Right whales, including mother/calf pairs, can be found 1/4 mile or more off Onslow Beach from 1 November to 30 April. Range Control requires range sweeps during this period in conjunction with live firing exercises into the BT-3 impact area.

- Coordination and Reporting — MCB Camp Lejeune will coordinate with the local NMFS Stranding Coordinator in the event of any unusual marine mammal behavior and any stranding, beached live/dead, or floating marine mammals.

The PSOs will record and document the dates, times, locations, species, number, distance, and behavior of marine mammals sighted during monitoring activities, as well as mitigation measures implemented.

- Vessel Operations — To avoid take during vessel operations, all USMC vessels shall abide by the following NMFS' Southeast Regional Viewing Guidelines (<http://www.nmfs.noaa.gov/pr/education/southeast/guidelines.htm>):
 - While in transit, vessels will be alert at all times, use caution, and proceed at a "safe speed" so that the vessel can take proper and effective action to avoid a collision with any marine animal and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

- When whales have been sighted in the area, vessels will increase vigilance and take reasonable and practicable actions to avoid collisions and activities that might result in close interaction of Navy/Marine Corps assets and marine mammals. Actions include changing speed and/or direction and are dictated by environmental and other conditions (e.g., safety, weather).
- Vessels will maneuver to remain at least 460 m (1,500 ft) from any observed whale and avoid approaching whales head-on. This condition does not apply if a vessel's safety is threatened, such as when change of course will create an imminent and serious threat to a person, vessel, or aircraft, and to the extent vessels are restricted in their ability to maneuver. Where feasible and consistent with mission and safety, vessels will avoid closing to within 183 m (200 yd) of marine mammals other than whales.
- Floating weeds, algal mats, Sargassum rafts, clusters of seabirds, and jellyfish are good indicators of marine mammals; therefore, increased vigilance in watching for marine mammals will be taken when these are present.

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4.0 NATURAL RESOURCES MANAGEMENT PROGRAM ACTIONS

4.1 PROTECTED SPECIES MANAGEMENT

As a federal agency, the Marine Corps is required under the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.) to conserve (i.e., recover) listed species on its properties. Provisions in the 2004 National Defense Authorization Act allow military installations to be excluded from critical habitat designation given that the following are true: the INRMP provides (1) a benefit to the species; (2) certainty that the management plan will be implemented; and (3) certainty that the conservation effort will be effective.

Threatened and Endangered Species are those species listed by USFWS as threatened or endangered. The federal classification system for listed species is as follows:

- **Endangered (E):** Any species that is in danger of extinction throughout all or a portion of its range,
- **Threatened (T):** Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range,
- **Proposed (P):** Any species that has been proposed for listing as a threatened or endangered species,
- **Candidate (CS):** Species for which there is sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened, and
- **Threatened due to similarity of appearance [T(S/A)]:** A species that is threatened due to similarity of appearance with another listed species and is listed for its protection. Taxa listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation.

MCB CAMP LEJEUNE THREATENED AND ENDANGERED SPECIES PROGRAM

Compliance with the ESA is an important part of protecting MCB Camp Lejeune's primary mission of training and maintaining combat ready troops. Compliance with the ESA means that MCB Camp Lejeune must carry out programs that promote recovery of listed species, and must consult with the USFWS on actions that may affect listed species. In addition to ESA compliance, further measures may be necessary to allow for exemption from critical habitat designation. In order to meet these obligations, MCB Camp Lejeune implements recovery plan guidelines, as well as any terms and conditions of past and future biological opinions. MCB Camp Lejeune actively manages for recovery of known populations of threatened and endangered species and periodically and systematically surveys for new populations. The

endangered species program can be categorized into four functional areas; protection, management, monitoring, and consultation.

The most important tool to avoid unauthorized “take” is protection of threatened and endangered species and their habitats from impacts due to development or other actions that may affect the species. For most threatened and endangered species on Base, this protection comes in the form of restricted access to particular areas or restrictions on the type of activities that may occur within a given area. Areas where activity is restricted due to the presence of threatened or endangered species will be clearly delineated with signs, paint, or other obvious markings. Protective measures for each species are specified in their respective sections below.

Management for listed species may focus on habitat, populations, or both. In most cases, ecosystem management activities, such as the use of prescribed fire, will benefit listed species. However, in order to promote survival and recovery most effectively, MCB Camp Lejeune, working with the USFWS, has identified specific management needs for each federally listed species. Intensity of management for each species will vary depending on available science and on the ability of MCB Camp Lejeune to take actions. For example, in the case of RCW, there is ample scientific literature and evidence supporting the effectiveness of habitat alteration and the creation of artificial cavities as a way to promote population growth. For a species like seabeach amaranth, an unpredictable annual plant, protection of the plant and its habitat, rather than management, is the most effective tool to promote the recovery of the species.

In order to gauge the effectiveness of management activities and to assess any population trends, an effective monitoring program must be implemented for each species. Monitoring is an essential aspect of any adaptive management program. MCB Camp Lejeune has implemented monitoring protocols for each threatened or endangered species. As with management activities discussed above, the intensity of the monitoring will depend on the type and amount of information needed to carry out an effective program.

4.1.1 Threatened and Endangered Species at MCB Camp Lejeune

MCB Camp Lejeune is home to nine species that are federally listed as threatened or endangered, proposed for listing as threatened or endangered, or a candidate for federal listing. They include the following species:

- Red-cockaded woodpecker (*Picoides borealis*) (E),
- Green sea turtle (*Chelonia mydas*) (T),
- Loggerhead sea turtle (*Caretta caretta*) (T),
- Rough-leaved loosestrife (*Lysimachia asperulaefolia*) (E),
- Seabeach amaranth (*Amaranthus pumilus*) (T),

- Piping plover (*Charadrius melodus*) (T),
- Red knot (*Calidris canutus*) (T),
- Hirst's panic grass (*Dichanthelium hirstii*) (CS), and
- American alligator (*Alligator mississippiensis*) [T(S/A)]*.

*The American alligator T(S/A), which is found on MCB Camp Lejeune, is federally listed as threatened due to its similarity of appearance to the endangered American crocodile. The American alligator is considered recovered, and actions that may affect it do not trigger section 7 consultation with the USFWS.

The endangered eastern cougar (*Puma concolor cougar*) is believed to be extirpated from Onslow County. Pondberry (*Lindera melissifolia*), a federally listed endangered plant, was reportedly collected on MCB Camp Lejeune from a single location in GSRA and identified off-site. However, the presence of pondberry on MCB Camp Lejeune has never been confirmed, despite repeated surveys.

The bald eagle (*Haliaeetus leucocephalus*) has been removed from the endangered species list, but it remains protected under the Bald and Golden Eagle Protection Act (BGEPA). Protective measures and monitoring requirements for bald eagles, described in this chapter, are requirements of MCB Camp Lejeune's permit under this law.

Although the management activities covered in this INRMP occur on land, military training activities that take place in the water may affect other protected species. The following federally listed species may occur in the waters surrounding MCB Camp Lejeune:

- Leatherback sea turtle (*Dermochelys coriacea*) (E),
- Kemp's ridley sea turtle (*Lepidochelys kempii*) (E),
- Hawksbill sea turtle (*Eretmochelys imbricata*) (E),
- Atlantic sturgeon (*Acipenser oxyrinchus*) (E),
- Shortnose sturgeon (*Acipenser brevirostrum*) (E),
- Fin whale (*Balaenoptera physalus*) (E),
- Humpback whale (*Megaptera novaeangliae*) (E),
- Northern right whale (*Balaena glacialis*) (E),
- Sei whale (*Balaenoptera borealis*) (E),
- Sperm whale (*Physeter catodon*) (E), and
- West Indian manatee (*Trichechus manatus*) (E).

All marine mammals, including non-federally-listed species, are protected by the Marine Mammal Protection Act (MMPA). Marine mammals and the MMPA will be discussed in Section 4.1.6.

4.1.2 Critical Habitat

With the passing of the National Defense Authorization Act of 2004, military lands were granted an exemption from the designation of critical habitat for endangered species, provided that an INRMP provides a benefit to threatened and endangered species. In order to meet the standard for exemption, an INRMP must meet the criteria discussed earlier; that is:

- A benefit must be provided for threatened and endangered species,
- The installation must provide certainty that it will be implemented, and
- The plan must be effective and should be developed with cooperating agencies that include USFWS and state fish and wildlife agencies.

Of the threatened and endangered species listed above, the piping plover, green sea turtle, and loggerhead sea turtle have had critical habitat designated by USFWS. Of these, only the piping plover and loggerhead have had critical habitat designated in the continental United States.

In 2001, the USFWS designated several areas along the North Carolina Coast as critical wintering habitat for the piping plover, with the closest habitat occurring at New Topsail Inlet just south of the Base on the Atlantic Coast. There is no designated critical habitat on MCB Camp Lejeune.

Critical habitat for the loggerhead sea turtle was designated in 2014. The nesting beaches and nearshore waters surrounding MCB Camp Lejeune were exempted from critical habitat because of protective measures already in place and additional measures MCB Camp Lejeune agreed to include in this INRMP.

4.1.3 ESA Section 7 Consultation

MCB Camp Lejeune regularly consults with the USFWS to ensure that Marine Corps actions are not likely to jeopardize the continued existence of any endangered or threatened species and are in compliance with the ESA. Pursuant to Section 7 of the ESA, Federal agencies such as the Marine Corps must consult with USFWS if their action "may affect" a federally listed endangered or threatened species (50 CFR 402). Such consultations may be formal or informal. When necessary, MCB Camp Lejeune prepares a biological assessment of the effects of a proposed action on listed species. Section 9 of the ESA prohibits unauthorized "take" of a threatened or endangered species. A "take" includes the direct killing, harming, or harassing of a

species, or destruction of habitat that may be important for the species' survival or recovery. For projects resulting in take, an incidental take statement must be obtained from the USFWS.

For projects that may affect listed species, MCB Camp Lejeune Threatened and Endangered Species Program staff will support development of projects through participation in the planning and design process. Relative impacts of projects and alternatives will be evaluated, and potential avoidance and mitigation measures will be identified. When appropriate, USFWS or NMFS input will be solicited during the design process and through Section 7 consultations.

The Biological Assessment and Biological Opinion for this INRMP will function as the consultation of record for all listed species for the next 5 years or until such time as a new consultation supersedes the measures in this document. Terms and conditions and conservation measures may continue in this INRMP, but the intent of this INRMP is to include all necessary protection, monitoring, and management measures for listed species.

GSRA Incidental Take Agreement

This plan and its associated Biological Assessment establishes an agreement with the USFWS that the occurrence of any new threatened and endangered species appearing in GSRA that results from beneficial fire management and other natural resource management effects will not result in additional constraints on training or range development. This agreement reaffirms an agreement already in place for RCW (Figure 4-1), but also will cover all species currently listed under the ESA, as well as species such as the eastern diamondback rattlesnake (*Crotalus adamanteus*) and Carolina gopher frog (*Rana capito*) that may become federally listed in the future. This agreement essentially pre-approves incidental take to any new occurrence of a listed species in GSRA, above the baseline. The baseline for RCW is zero clusters. This agreement will apply to any incidental take resulting from all training activities and range development projects, as well as any supporting infrastructure and facility development projects. All consultation requirements associated with this agreement will be completed during the USFWS INRMP review and approval process. Subsequent to the INRMP consultation, any listed species that appear as a result of prescribed fire or other habitat management activities can be taken



Figure 4-1. Adult female RCW

without further USFWS approval or consultation. MCB Camp Lejeune will notify USFWS of any incidental take, potentially in annual INRMP update reports.

4.1.4 Threatened and Endangered Species Management

Outlined below are programs that address protection, management, and monitoring for all protected, threatened, and endangered species that regularly occur on MCB Camp Lejeune. It is MCB Camp Lejeune's belief that this INRMP provides a conservation benefit to each of these species and outlines a clear, measurable path to implementation. Further, MCB Camp Lejeune believes that the Threatened and Endangered Species programs described in this chapter meet the necessary requirements to exempt the Base from designated critical habitat for any of the listed species on Base.

4.1.4.1 Red-cockaded Woodpecker

For the 2013 nesting season, MCB Camp Lejeune reported 114 active RCW clusters. This represents an increase of 256 percent since 1986, when intensive population monitoring began, and a 44 percent increase during implementation of the current INRMP (Figure 4-2). Since signing of the last INRMP, MCB Camp Lejeune's RCW population has averaged 5.2 percent growth per year. Locations of active and inactive clusters are shown in Figure 4-3.

PREVIOUS RED-COCKADED WOODPECKER PLANS

1999 RCW Plan

In 1999, MCB Camp Lejeune coordinated with the USFWS to develop the Mission-Compatible, Long-Range RCW Management Plan (1999 RCW Plan). The plan was endorsed in December 1999 with implementation initiation in 2000. A Biological Opinion supporting plan implementation was signed November 30, 1999. The 1999 RCW Plan established a mission-compatible RCW goal of 173 active clusters, outlined management strategies, and accounted for incidental take. According to the 1999 plan, all restrictions on the military mission would be removed once the mission compatible goal of 173 clusters was met and maintained.

The 1999 RCW Management Plan set a local recovery goal of 173 active clusters on Mainside and Verona (Figure 4-4). This goal was based on available acreage, excluding GSRA, and accounted for incidental take in support of mission-essential construction and range development in the GSRA Mechanized Assault Course and the Cantonment-Housing Area.

In support of future facility development, up to six RCW clusters in the Cantonment-Housing Area on Mainside MCB Camp Lejeune were subject to incidental take under the 1999 Plan. The 1999 plan identified five potential RCW clusters subject to incidental take for the Mechanized

Assault Course, which was not built. Current efforts to develop a mechanized maneuver area are focused on GSRA, which does not contribute to the MCB Camp Lejeune RCW recovery goals.

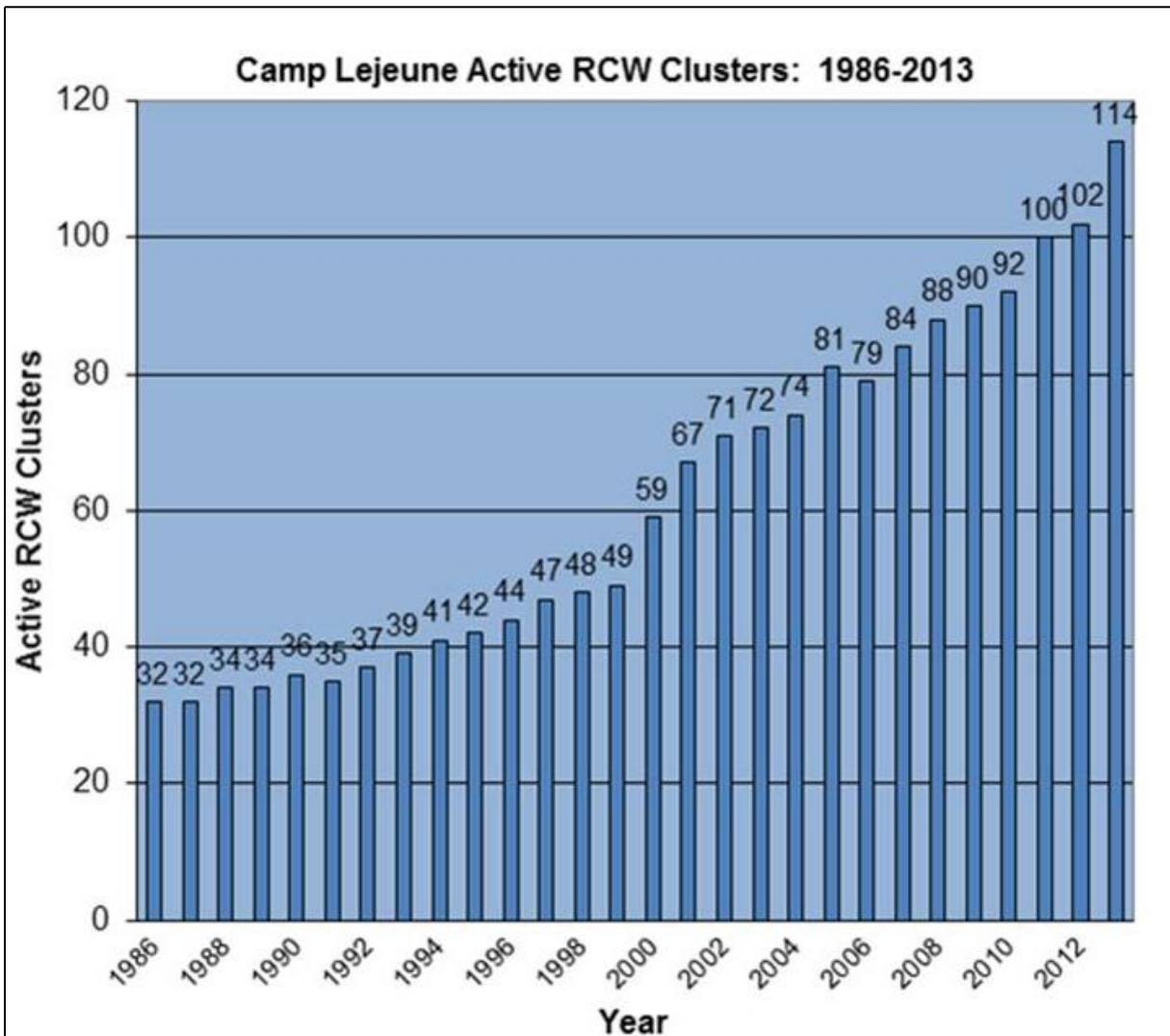


Figure 4-2. Number of active RCW clusters on MCB Camp Lejeune from 1986 to 2013

RCW Management – 2007 INRMP

In the 2007 plan, MCB Camp Lejeune introduced the concept of partition-level management, unmarked clusters only in High-Use Training Areas, and population milestones which, when met, will allow MCB Camp Lejeune to remove buffers from an increasing percentage of RCW clusters.

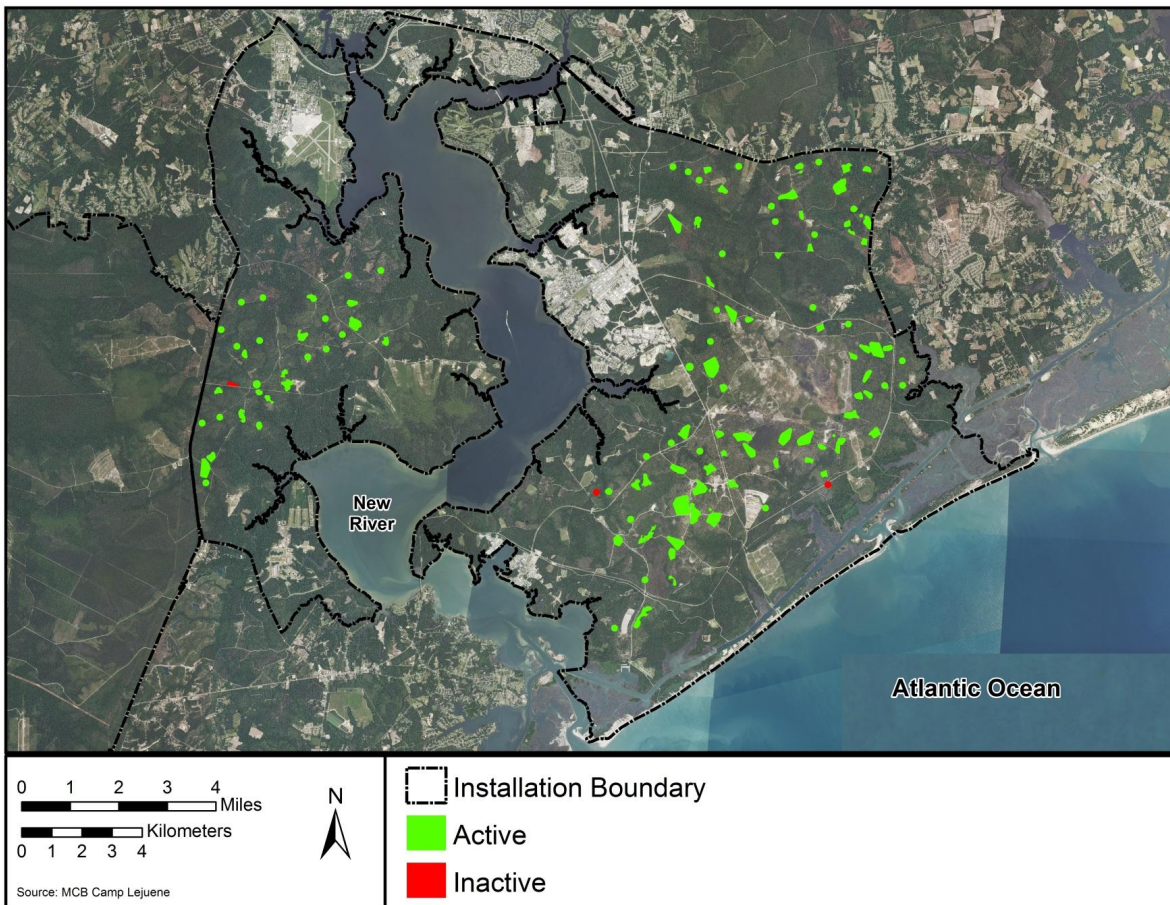


Figure 4-3. Active and inactive RCW clusters on MCB Camp Lejeune as of April, 2013

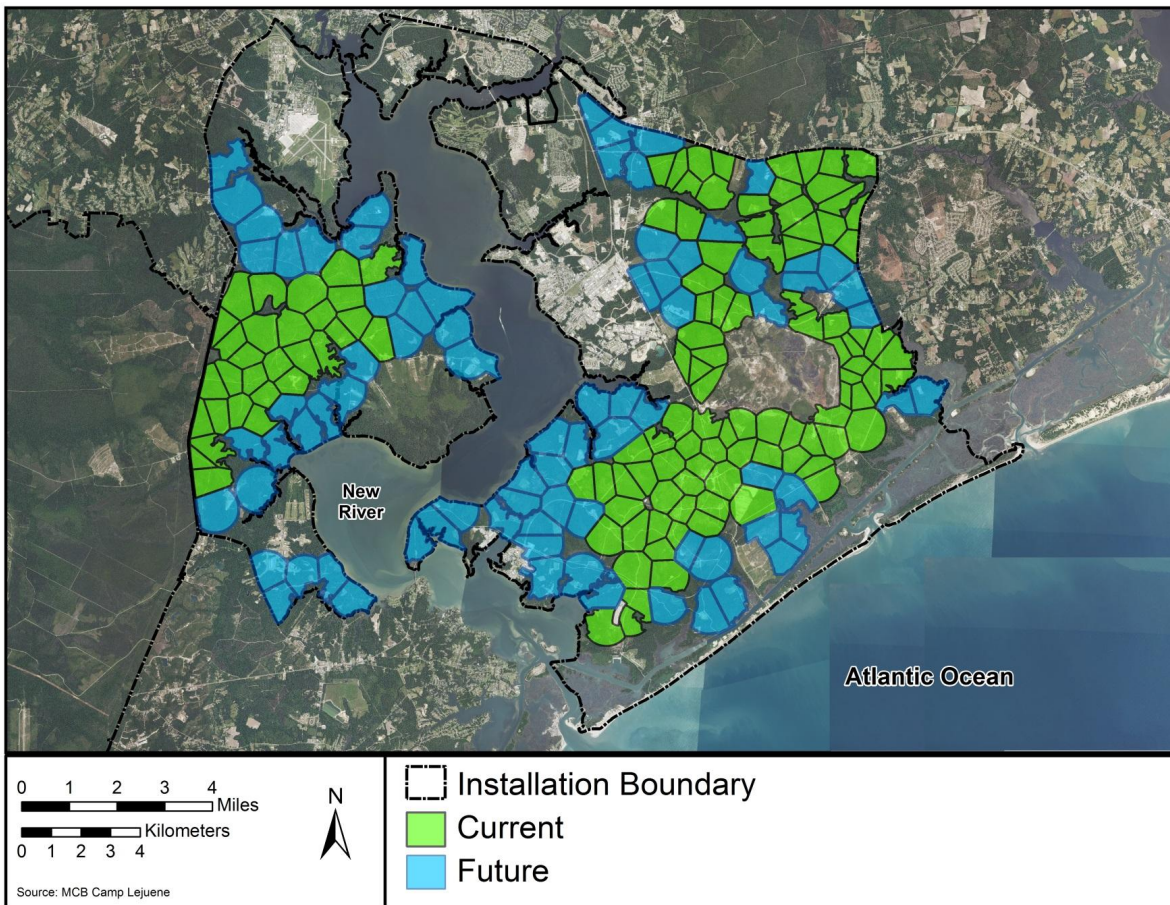


Figure 4-4. RCW management partitions

2014 RCW MANAGEMENT PLAN

For the current INMRP, MCB Camp Lejeune will continue to manage RCW habitat at the partition level. Partition level management will remain essentially unchanged from 2007. MCB Camp Lejeune will continue to manage for a minimum of 120 acres of good quality foraging habitat as defined in the 2003 RCW Recovery Plan (USFWS, 2003). For planning purposes, the objective of partitions is an average of 200 acres of suitable or potentially suitable habitat, as recommended in the 2003 RCW Recovery Plan. A goal in this INRMP will be to increase the frequency of burning across the Base, and move closer to an average of a 3-year return interval, with an increasing percentage of burning occurring in the growing season.

Although partition-level habitat management will remain essentially the same, this INRMP incorporates a number of RCW population and habitat management changes that are designed to alleviate constraints on military training capabilities. An overarching goal of this INRMP will be to facilitate off-road mechanized maneuver training. Management of RCW will play a critical role in the development of off-road mechanized maneuver training capabilities. In GSRA, MCB Camp Lejeune will suspend planting longleaf pine, and management aimed specifically at RCW habitat improvement will be put on hold pending completion of the planning/design process for the GSRA TVMC or at the end of the 5-year INRMP period, whichever comes first. Prescribed burning for ecosystem restoration and general habitat improvement will continue on GSRA during the interim planning period, and MCB Camp Lejeune will continue to implement timber stand improvement projects to increase productivity and reduce fuel levels.

In this INRMP, there are no designated or mapped “high-use training areas.” Instead, whether a cluster is to be marked will be determined through coordination between EMD and G3 at the time of installation based upon the expected impact on tactical maneuver by operating forces. Unmarked clusters will be more likely in highly used training areas. Additionally, we may decide not to install, shift, or postpone recruitment clusters in highly-used training areas. Finally, this plan will simplify the system of population milestones introduced in the 2007 INMRP for demarking clusters.

RCW Habitat Management

MCB Camp Lejeune will continue to evaluate and treat RCW foraging habitat at the partition level. The objective of partition-level management is to provide sufficient suitable habitat within each individual foraging partition and improve habitat quality with each successive treatment. Conversion of off-site pine to longleaf may create near and midterm exceptions to the continual improvement guidelines, but will result in net habitat improvement over the long term. A detailed explanation of Partition Level Management is provided in the revised MCB Camp Lejeune RCW Recovery Plan (Appendix 6).

Forest management is a main component of managing habitat for RCW. The Forestry section is responsible for prescribing silvicultural treatments to the MCB Camp Lejeune forest landscape, including all RCW partitions. The Threatened and Endangered Species section at MCB Camp Lejeune works closely with the MCB Camp Lejeune Forestry section to ensure that all proposed silvicultural prescriptions will benefit the RCW where appropriate, and that those prescriptions follow the guidelines of the 2003 RCW Recovery Plan. Silvicultural activities to benefit RCW may include thinning of mature pine timber to no less than 40 sq ft of basal area, removal of mature canopy hardwoods (canopy hardwoods are not to exceed 10 percent in good quality RCW habitat), retention of potential cavity trees, and 2-aged and uneven-aged management for pine. More details of the silvicultural techniques can be found in Appendix 8, Silvicultural Systems Utilized on MCB Camp Lejeune.

Forest management will continue to operate at the compartment level (See Section 4.2, Forest Management), treating each compartment on a 10-year cycle. However, compartments will also be evaluated at the partition level to ensure that treatments meet the partition level RCW habitat objectives. Partitions will generally be assessed and treated on the 10-year compartment schedule; however, partitions in urgent need of management, such as those expected to be occupied by RCWs in the short term, or those with a majority of old loblolly, will be addressed outside of the 10-year prescription cycle. Although partitions may overlap forest stand and compartment boundaries, most forest management treatments will be prescribed at the stand level. Forest management will be consistent with all recommendations in the 2003 RCW Recovery Plan with respect to size of clear-cuts and acceptable silvicultural techniques.

Forest management will continue to emphasize increasing the amount of good quality foraging habitat as described in the 2003 RCW Recovery Plan, while also converting from off-site species to longleaf pine. Foraging habitat guidelines from the 2003 RCW Recovery Plan 2nd Revision (USFWS, 2003) are reproduced in Appendix 6. Consistent with these guidelines, MCB Camp Lejeune will manage toward a minimum of 120 acres of “good quality” foraging habitat and will increase the acreage of habitat meeting some or all of the characteristics of good quality habitat through the application of prescribed fire, silvicultural treatments (including pine thinning and canopy hardwood removal), and hardwood/midstory management. Longleaf pine restoration may result in temporary degradation of habitat quality.

The role of fire in the longleaf pine/wiregrass ecosystem is varied and includes suppression of hardwood midstory, forest fuels reduction, and propagation of herbaceous plants through the stimulation of flower, seed and fruit production. Many species that occur in the longleaf pine/wiregrass ecosystem show adaptations to frequent, low intensity fires. The application of prescribed burning is a major component of RCW habitat management on MCB Camp Lejeune. See Section 4.2, Wildland Fire Management, for more detail on MCB Camp Lejeune’s prescribed burning program. Historically, most of the forests on MCB Camp Lejeune would have burned every 2 to 3 years, primarily in the growing season. This frequency and timing

provide the greatest benefit to RCW and other listed species, as well as help create and maintain an open training environment for Marines. Goals for RCW management in this INRMP are to burn as much of the Base forested areas as possible on a 3-year frequency, and to increase the proportion of fires that occur in the growing season.

Hardwood encroachment, whether in the midstory or in the canopy, is a leading cause of cluster abandonment by RCW. The primary means of hardwood suppression on MCB Camp Lejeune will continue to be the application of prescribed fire to the landscape during the growing season as much as possible. Mechanical removal of hardwoods may be utilized in partitions where fire may not have occurred in several years or in current clusters showing signs of hardwood encroachment. The Base Forestry section will accomplish this during timber thinning operations or separately by mechanical means. Discussions of these methods can be found in Chapter 4, Sections 4.2 and 4.3.

RCW Cluster Management and Protection

Management of RCW clusters involves ensuring sufficient usable cavities, controlling midstory, protecting cavity trees from prescribed fire and wildfire, and identifying (marking) cavity trees and buffer zones to protect clusters from certain aspects of military training.

MCB Camp Lejeune maintains a minimum of four suitable RCW cavities per group. Each RCW cavity tree is assigned a unique identification number. The global positioning system (GPS) location of the cavity tree is recorded, as is the tree species, physical characteristics, cavity condition, and cavity status. The cavity trees are protected from prescribed fire treatments by clearing vegetation in an approximate 12-foot radius from the base of the tree (Figure 4-5). To prevent cluster abandonment resulting from hardwood encroachment, the cluster is treated by prescribed burning on a 3-year rotation basis. Further, if hardwoods or pine trees threaten to block access to the cavity, the trees will be selectively removed. Also, if hardwood midstory becomes a problem throughout a cluster, the midstory will be removed, either manually or mechanically.



Figure 4-5. RCW cavity tree with vegetation-free buffer for prescribed fire treatments

Cluster protection involves marking clusters with painted buffers and imposing training restrictions within those buffers. As with the previous INRMP, some RCW clusters will not be marked and the proportion of marked clusters will decrease as the population grows. With this

INRMP, MCB Camp Lejeune will continue to paint buffers at 200 ft from the cavity trees, with a secondary invisible buffer of 50 ft around marked cavity trees. Appendix 6 contains a detailed description of the training activities allowed in marked RCW clusters.

Population Milestones and Monitoring

MCB Camp Lejeune will continue to implement a system by which training restrictions are removed from clusters as population milestones are met. Milestones will be in increments of 25 active clusters, and the percentage of unmarked clusters will increase as each milestone is met. The actual number of marked clusters will vary depending on population growth and occupation rate of recruitment clusters. The actual distribution of recruitment clusters, and numbers of marked and unmarked clusters, will depend on site-specific circumstances and actual growth rates in active clusters. Appendix 6 contains a more detailed forecast table.

Marked clusters will continue to have military training restrictions. However, once MCB Camp Lejeune reaches its recovery goal of 173 active clusters, it will have the option of removing all training restrictions from all clusters. At that point, MCB Camp Lejeune will be required to maintain a recovered population of at least 173 active clusters. Given this consideration, MCB Camp Lejeune may elect to retain some restrictions on some clusters until there is a comfortable buffer above the threshold of 173 active clusters.

MCB Camp Lejeune's RCW population has been intensively monitored since 1985. Population demographics, reproductive success, and home range data is collected and interpreted annually. Breeding season monitoring records clutch sizes and fledgling success, with every fledgling receiving identifying bands. Breeding status of adult birds is also documented annually, allowing accurate accounts of the number of helpers in the population. Results of this monitoring are reported to the USFWS annually. MCB Camp Lejeune will continue to monitor 100 percent of its RCW population in this manner. A detailed monitoring plan is included in Appendix 6.

Management in Support of Training Projects in RCW Habitat

Threatened and endangered species managers will participate in the range development process to help avoid and minimize impacts on RCW clusters and foraging habitat. Future projects and alternatives, including BCTMC (CAAAC Phase I), will be evaluated for relative impacts and potential mitigation measures.

Where possible, RCW management will focus on areas not designated for future projects, and/or management will be done in a way that minimizes potential conflicts. Where impacts to current or future habitat are unavoidable, RCW managers can mitigate impacts through strategic placement of artificial cavities and recruitment clusters.

In areas planned for future RCW clusters, RCW managers will place recruitment clusters in ways that minimize future conflicts. Areas without active clusters have ample flexibility in terms of

placement of the cavity trees and acreage of foraging partitions that allows for avoidance of conflicts with known training priorities. As much as possible, MCB Camp Lejeune RCW managers will seek to manage habitat in a way that avoids conflicts with known future projects.

Where impacts to existing clusters are unavoidable, artificial cavities can be used to replace lost cavities or to shift nesting activity away from areas of high-intensity training. MCB Camp Lejeune has achieved some success in minimizing the loss of clusters due to the G-10 Range Transformation by installing replacement clusters near clusters that were removed for new ranges. In an effort to assess impacts of mechanized training in RCW habitat, a habitat monitoring plan will accompany future training corridor projects like the BCTMC. MCB Camp Lejeune will proceed in its development of the BCTMC with the assumption that off-road tactical vehicle and tracked vehicle maneuver is not compatible with RCW management practices. The period of this INRMP will be used to monitor and evaluate RCW responses to off-road maneuver to validate or invalidate this assumption.

RCW Recovery and Sustainment Program (RASP)

The RASP was developed by MCB Camp Lejeune and USFWS as a strategy to establish new RCW subpopulations or add to existing subpopulations within the CNCPC while simultaneously alleviating constraints on the Marine Corps training mission. The RASP allows MCB Camp Lejeune to enter into agreements with agencies, non-governmental organizations, and private landowners to establish new RCW groups on off-base properties that contribute to the CNCPC. In return, MCB Camp Lejeune's on-base RCW recovery goal can be reduced, thereby alleviating constraints on mission-critical range and training area capabilities.

Although the RASP may eventually lead to a reduction in the number of active RCW clusters on MCB Camp Lejeune, the establishment of RCW groups on RASP properties may have a net beneficial effect on recovery of the overall CNCPC population by accomplishing one or more of the following; increasing connectivity between subpopulations, increasing the viability of certain subpopulations, or minimizing threats to population viability. Rigorous modeling analyses are used to evaluate the potential biological functionality of individual RASP properties as well as their potential to contribute to the ecological functionality of the overall CNCPC population. RASP property agreements must provide for the management and protection of the properties and their associated RCW groups in perpetuity.

RASP does not establish an RCW credit/debit process, nor does it authorize incidental take for projects on MCB Camp Lejeune. The Section 7 consultation process and any incidental take authorizations for projects that are expected to result in RCW take on MCB Camp Lejeune will be separate from the RASP process. However, RASP will allow MCB Camp Lejeune to expand the scope of Section 7 consultations to include the entire CNCPC population. Currently, Section 7 consultations for on-base projects consider the effects of take on the RCW population inside the base boundary. Under RASP, Section 7 consultations can consider the effects of take on the

overall CNCPC population, including RCW groups on RASP properties. It is expected that RASP properties and their associated RCW groups off-set any decreases in functionality associated with project-related RCW take on MCB Camp Lejeune. This off-setting effect would provide USFWS with greater flexibility in making jeopardy/non-jeopardy determinations and authorizing incidental take for proposed range projects on MCB Camp Lejeune.

Section 7 consultations will employ modeling analyses to essentially weigh the negative effects of on-base take against the positive effects of the RASP properties on the ecological functionality of the overall CNCPC population. As stated in the USFWS Biological Opinion for the RASP: “This balancing will be based on the ecological function of the CNCPC population as a whole and may or may not represent a direct 1:1 relationship between the number of RCW groups on the RASP properties and the RCW groups that would be affected by the proposed action.” Thus, the benefits provided by a specific RASP property will depend on its contribution to the ecological functionality of the CNCPC population, which in turn is influenced by a number of factors; including proximity to other CNCPC subpopulations, distribution within the landscape, and readiness (i.e., suitability as foraging and nesting habitat and time to maturity).

4.1.4.2 RCW Conservation Goals and Measures

GOAL/OBJECTIVE TES1: Manage RCW habitat to increase “good quality” habitat for each partition.

- **Action 4.1-01:** *MCB Camp Lejeune will manage for RCW habitat at the partition level, both within and outside of the normal silvicultural prescription cycle.*
- **Action 4.1-02:** *Restore longleaf pine within the guidelines of the 2003 RCW Recovery Plan for the RCW on Mainside. Longleaf pine restoration in the GSRA will be reevaluated upon completion of the TVMC range planning and development process.*
- **Action 4.1-03:** *Make progress toward burning all existing and potential RCW habitat on a 3-year rotation, and increasing growing season burning to greater than 50 percent.*

GOAL/OBJECTIVE TES2: Promote RCW population growth toward 173 active clusters through cluster management and protection and through population manipulation.

- **Action 4.1-04:** *Implement monitoring and protection plan for RCW.*
- **Action 4.1-05:** *Maintain minimum growth rate of 5 percent per year (avg. over 10 years).*

GOAL/OBJECTIVE TES3: Develop and maintain a complete and current data set to effectively manage RCW on MCB Camp Lejeune.

- **Action 4.1-06:** *Monitor 100 percent RCW population annually.*

- **Action 4.1-07:** *Survey annually for new cavities.*

GOAL/OBJECTIVE TES4: Manage MCB Camp Lejeune’s RCW population to increase mission flexibility for future training and range development needs.

- **Action 4.1-08:** *Apply RCW population model to forecast impacts to demographic stability from range and facility development.*
- **Action 4.1-09:** *Implement management strategy that allows for removal of training restriction as population milestones are met.*
- **Action 4.1-10:** *Maintain 200 ft cluster buffer.*
- **Action 4.1-11:** *Direct RCW management to allow for future mechanized maneuver corridors through RCW habitat.*
- **Action 4.1-12:** *Implement a study to monitor the effects of mechanized maneuver in the BCTMC corridor.*

4.1.4.3 Sea Turtles

The ESA protects all six species of sea turtles in the United States. Two species, the green sea turtle and the loggerhead sea turtle (Figure 4-6), are listed as threatened and nest at MCB Camp Lejeune on Onslow Beach. Three additional endangered species, the Atlantic hawksbill turtle, the Atlantic leatherback turtle, and the Kemp’s ridley turtle occur in the waters off the coast of MCB Camp Lejeune, but are not known to nest aboard the installation. Both leatherbacks and Kemp’s ridleys have nested in North Carolina, but not on MCB Camp Lejeune. Protective measures outlined here will apply to any species of turtle that nest on Onslow Beach. Sea turtle nesting has been monitored on Onslow Beach since 1979.

Approximately 11 miles of MCB Camp Lejeune Beach are monitored annually. From mid-May through August, Base personnel conduct daily morning surveys of Onslow Beach to look for sea turtle crawls. When crawls are found, numbers and locations of sea turtle nests and crawls are recorded. If training is to occur at night, Base personnel will conduct night surveys and, in addition to looking for crawls, record individual tagging and size data and allow for immediate protection of sea turtle nests. Brown’s Island, a duded impact area, is monitored at least twice per week during the nesting seasons by air. Sea turtle nests found in the designated military training portion of the beach are relocated. Nest relocations occur no later than 9:00 A.M. Nests laid below the mean high tide line are also eligible for nest relocation.

As the nests near the end of incubation, they are checked each morning for signs of hatching, hatchling emergence, or predation. After emergence, hatchling tracks are counted to estimate a measure of success before the completion of nest inventory.

The northern end of Onslow Beach and Brown's Island are designated as the N-1/BT-3 Impact Area (Figure 4-7). Currently, access to the north end of Onslow Beach is authorized with certain safety precautions. Vehicular traffic on wet sand is authorized after weekly sweeps for unexploded ordnance. Brown's Island is inaccessible, except by boat, and it is not regularly checked for unexploded ordnance. Therefore, no ground-based monitoring or nest management occurs there.

The shorebird and sea turtle nesting season occurs from April 1 to August 31, during which time recreational driving on Onslow Beach is restricted to training areas only. Recreational driving is permitted on the beach to the inlet outside of the nesting season. This restriction helps conserve sea turtles and other sensitive species and habitat on South Onslow Beach.

Onslow Beach is an index nesting site for the State of North Carolina, which makes the data collected here important to regional sea turtle management and recovery. MCB Camp Lejeune enters nesting data directly into the NCWRC database via the Seaturtle.org website. A detailed description of protective measures for sea turtles, which also exempt MCB Camp Lejeune from critical habitat for the loggerhead sea turtle, can be found in Appendix 9.



Figure 4-6. Loggerhead sea turtle hatchling

4.1.4.4 Sea Turtle Conservation Goals and Measures

GOAL/OBJECTIVE TES5: Continue current management and monitoring of sea turtles on Onslow Beach and Brown's Island.

- **Action 4.1-13:** *Protect sensitive habitat at South Onslow Beach.*
- **Action 4.1-14:** *Enter sea turtle data into NCWRC database via seaturtle.org.*
- **Action 4.1-15:** *Continue to implement protective measures for sea turtles in-water (see Appendix 10 for in-water training protocol for sea turtles and marine mammals).*

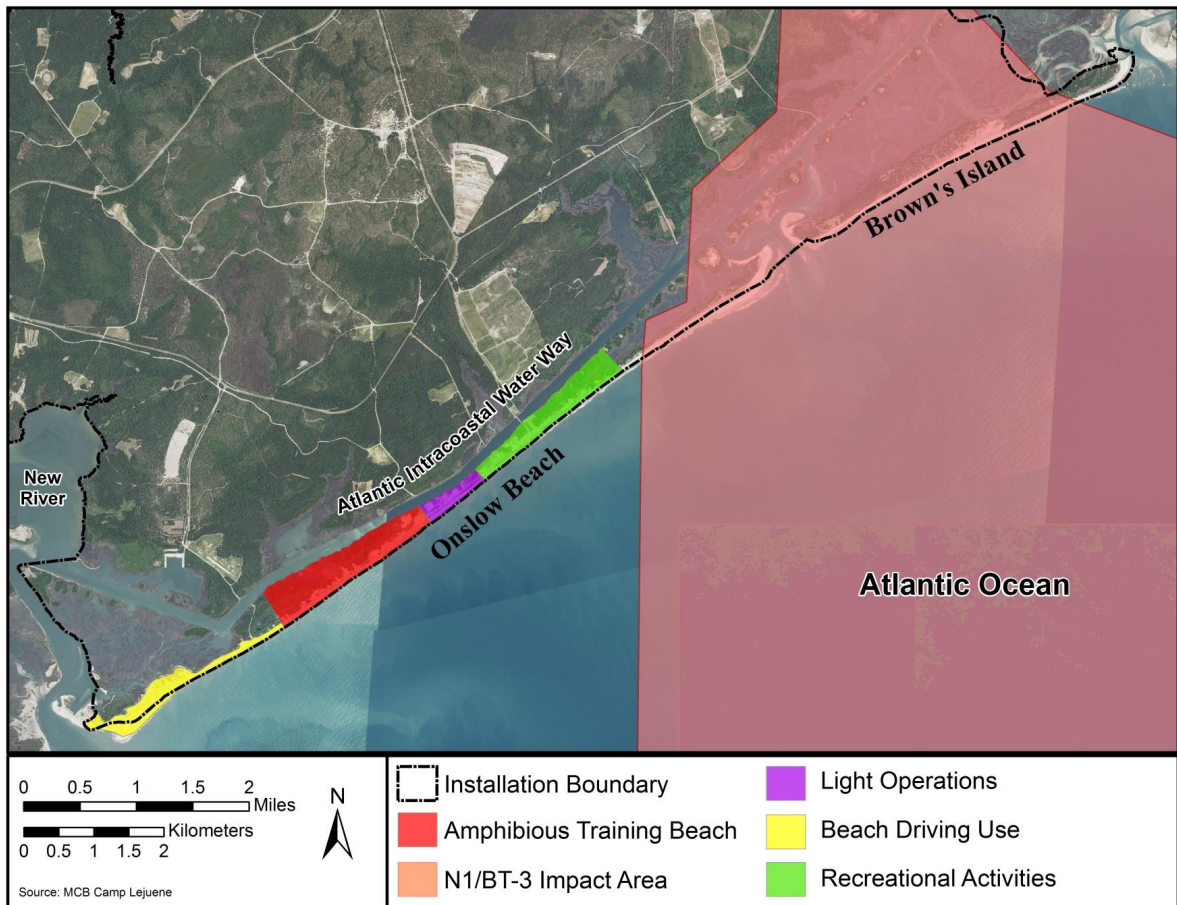


Figure 4-7. Onslow Beach and Brown's Island map showing designated training and recreational areas

- **Action 4.1-16:** *Implement MCB Camp Lejeune sea turtle protocol.*
- **Action 4.1-17:** *Continue to reduce sources of artificial lighting on Onslow Beach.*

4.1.4.5 Rough-leaved Loosestrife

Rough-leaved loosestrife (Figure 4-8) typically occurs at the ecotone between savanna or flatwoods and pocosins, where the water table is near the surface during winter and early spring.

Plants do best in habitat where shrubby vegetation is kept low by frequent natural or prescribed fires. Rough-leaved loosestrife is managed on MCB Camp Lejeune through the application of prescribed fire at a return treatment interval of 2 to 3 years. Fire management may be supplemented by mowing of shrubby vegetation with a brush mower in the winter, when rough-leaved loosestrife is dormant. Known sites occurring in a Duke Energy utilities power line right-of-way on Base are maintained through periodic mowing. Additionally, beneficial silvicultural measures, such as commercial thinning and harvest treatments that remove up to 25 percent of the canopy cover on rough-leaved loosestrife-occupied sites, may be employed to improve habitat conditions.



Figure 4-8. Rough-leaved loosestrife

Approximately 46 acres of habitat are currently occupied by rough-leaved loosestrife at MCB Camp Lejeune (Figure 4-9). Rough-leaved loosestrife sites on MCB Camp Lejeune are protected through the application of land restrictions for specific training, management, and construction activities. Rough-leaved loosestrife sites will be buffered and marked with signs identifying the area as a rough-leaved loosestrife site, and stating prohibited activities (no digging, no vehicles, and no bivouacs). The protective buffer for rough-leaved loosestrife extends 100 ft from the most peripheral individual plants. In total, the marked buffers protect approximately 75 acres of habitat. The following restrictions apply in rough-leaved loosestrife buffer zones:

- Vehicular traffic is prohibited with the exception of those responding to a fire emergency or associated with an authorized silvicultural treatment,
- Excavation and/or soil disturbance is prohibited,
- Bivouacking or extended occupation of the site is prohibited, and
- Alteration of hydrologic conditions is not authorized.