Biological Evaluation

for the

Proposed United States Army Military Training Activities on the Savannah River Site

Department of the Army – Fort Gordon Range Control – Directorate of Plans, Training, Mobilization, and Security

Location:

Aiken, Allendale, and Barnwell Counties, SC., Savannah River Site

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Submitted by Fort Gordon Range Control Training Facility Coordinator (DPTMS)

Prepared By: _____
Donald S. McLean, Training Facility Coordinator Fort Gordon Georgia **Date:**

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Attachments

- US Army Corps of Engineers Final Report Assessment of Training Noise Impacts on the Red-cockaded Woodpecker
- US Army Corps of Engineers Assessment of Effects of Maneuver Training Activities on Red-cockaded Woodpecker Populations on Fort Stewart, Ga.
- Aerial Photo of Fort Stewart TES Locations
- 2007 Army RCW Management Plan
- Short nosed sturgeon Bathymetry

SUMMARY

In accordance with the Memorandum of Understanding (MOU) September, 2007 and the Interagency Agreement (IAG), 2009, between the U.S. Department of the Army Fort Gordon and U.S. Department of Energy-Savannah River (DOE-SR); the Army proposes to use DOE-SR managed land for non-live fire training activities to supplement Army wide shortages of available training lands. The Savannah River Site (SRS) covers 198,000 square acres; of which only select locations of roughly 120,000 square acres could be used for military training. Within these 120,000 acres, various locations will be restricted to military training activities because of environmentally protected areas, concern to federally protected species and their habitat, and other restrictions imposed on the Army by DOE-SR and agreed to by Fort Gordon Range Control (FGRC). The scope of the training activity will dictate which portions of the 120,000 acres of available land will only be used.

In accordance with the National Environmental Policy Act (NEPA) Analysis Guidance Manual 2007, the action agency is not required to prepare a biological assessment for actions that are not major activities, but if a listed species or critical habitat is likely to be affected, the agency must provide an evaluation of likely effects of the action. Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies to consult with the appropriate regulator; U.S. Fish and Wildlife Service (USFWS) or the National Oceanic Atmospheric Agency – Fisheries [NOAA Fisheries]) if a proposed action authorized, funded, or carried out by them may affect a listed species or critical habitat. This Biological Evaluation (BE) is required because of the five species of federally listed endangered species:

- Smooth purple coneflower (*Echinacea laevigata*) - endangered
- Pondberry (*Lindera melissifolia*) - endangered
- Shortnosed sturgeon (*Acipenser brevirostrum*) - endangered
- Wood stork (*Mycteria Americana*) - endangered
- Red-cockaded woodpecker (RCW) (*Picoides borealis*) – endangered

This Biological Evaluation will also address the following species:

- American Alligator (*Alligator mississippiensis*) - threatened by Similarity of Appearance
- Bald Eagle (*Haliaeetus leucocephalus*) Bald and Golden Eagle Protection Act; Migratory Bird Treaty; Sensitive Species

This proposed activity does not recommend any actions that would qualify for the re-initiation of a formal consultation for any of the aforementioned federally protected species. In addition, this biological evaluation concludes that the proposed training activities by the Army or other military units in general, ***may affect, but not likely adversely affect, individual species***.

This Biological Evaluation, in accordance with the Joint Standard Operating Procedure (JSOP), SRS Land and Facilities, applies to all Army units, the Army Reserve, the Army National Guard, FGRC, Department of the Army Civilians (DACs), sponsors and contractors associated with and or attached to the Army for the purpose of training on DOE-SR. Other military organizations include the Navy, Air Force, Marine Corps, and U.S. Armed Forces jointing operating on DOE-SR for the purpose of military training.

The term Army will be used throughout this BE applies to all aforementioned Armed Services.

Introduction

This BE shall evaluate the potential effects of the proposed action on listed and proposed species and designated and proposed critical habitat and determine whether any such species or habitat are likely to be adversely affected by the action and is used in determining whether formal consultation or a conference is necessary.

In accordance with the Army Environmental Command, Final NEPA Analysis Guidance Manual, Section 7(a)(2) of the ESA 1973 requires federal agencies to consult with the appropriate regulator (USFWS or NOAA Fisheries) if a proposed action authorized, funded, or carried out by them may affect a listed species or critical habitat.

Pursuant to Section 7(a) (4) of the ESA, Federal agencies must consult with USFWS or NOAA-Fisheries on proposed actions that are likely to jeopardize the continued existence proposed species or result in the destruction or adverse modification of proposed critical habitat.

During consultation, a biological assessment or other evaluation document must be developed that assesses the proposed action's effects on listed species. If the action agency determines that the proposed action will not likely adversely affect the listed species or critical habitat and USFWS or NOAA-Fisheries concurs, then consultation concludes and no formal consultation is required.

If the action agency determines that a proposed action will likely adversely affect a listed species or critical habitat, then formal consultation is initiated. Formal consultation results in a Biological Opinion by USFWS or NOAA-Fisheries that concludes whether the proposed action is likely to jeopardize the continued existence of the species and/or will result in destruction or adverse modification of critical habitat. For "non-jeopardy" opinions, an incidental take statement (if applicable) will be issued if take is anticipated. The incidental take statement will include the number of authorized take and non-discretionary reasonable and prudent measures that the installation must undertake to minimize the incidental take.

If a "jeopardy" opinion is issued, potential impacts are indicated, reasonable and prudent alternatives are recommended that would avoid the likelihood of jeopardizing the listed species or the destruction or adverse modification of designated critical habitat, and measures to minimize the effect are listed.

If "jeopardy" or "adverse modification" cannot be avoided, an exemption from the ESA may be requested by the action agency, though no federal agency has ever requested an exemption from the ESA.

Project Description

The U.S. Department of the Army Fort Gordon and DOE-SR propose to use DOE-SR land for non-live fire training activities. This proposed action would entail low impact training events that may affect, but are not likely to affect, listed species. Training activities could include the following:

- Army Aviation (Fixed and Rotary Wing)
- Light Maneuver Forces (Rubber boat water craft, wheeled vehicles, and foot traffic)
- Service Support Units (Supply, Maintenance, Transportation, Health services, Light Engineers, Military Intelligence, Chemical, and Signal)

Purpose and Need for Proposed Action

It must be made clear that as part of the proposed action, DOE-SR would not have to adjust land use management to support the proposed Army training activities. For the most part, Army activities are secondary and will not interfere with DOE-SR missions, operations, and activities at SRS. This specifically refers to U.S. Department of Agriculture (USDA)-SR activities. Army training events will be coordinated and approved by DOE-SR. The Army has a record of being stewards in environmental protection.

Army training scenarios to meet emerging threats require the use of parcels of contiguous and noncontiguous land for maneuver training. These scenarios will require training across broad landscapes with units positioned at noncontiguous, non-linear parcels of land.

Land resources currently available to the Army in the southeastern United States are not capable of supporting these non-contiguous training scenarios. The Army has a need to access additional lands suitable for training within proximity to existing Army installations in the southeastern United States.

In 2006, the Army was short approximately 2 million acres of maneuver training land to meet the training requirements for the units stationed in the Continental United States (CONUS). This overall land shortfall has been exacerbated by:

- Army Transformation
- The 2005 Base Realignment and Closure (BRAC)
- The Army's Global Defense Posture Realignment (GDPR)
- The Contemporary Operating Environment (COE)
- The Department of the Army Grow the Army initiative.

Consequently, by 2011 the Army will have a shortfall of approximately 5 million acres of maneuver training land in the CONUS needed to train Army forces (reference). Based on this, the Army has developed a strategy to help overcome this maneuver training land shortfall, which includes: focused management of existing lands to maximize the use of all maneuver training lands; buffering through partnerships to establish Army Compatible User Buffers around Army installations to protect the current installation training capabilities from urban encroachment; and use of other federal lands for training Army forces. It is not reasonable for the Army to expect to be able to purchase sufficient acreage to make up for this training land shortfall.

Within the southeastern United States, the Army has 3 major installations where Army tactical units are stationed and train. These are Fort Bragg, North Carolina and Forts Benning and Stewart in Georgia. In addition, Fort Rucker, Alabama hosts the basic aviation training for all Army aviators. Combined, these 4 installations are short 955,912 acres of land to support current training requirements. Individually, the installations are short the following number of aces:

- Fort Bragg, North Carolina - 479,182 acres
- Fort Stewart, Georgia - 274,525 acres
- Fort Benning, Georgia – 186,693 acres
- Fort Rucker, Alabama - 15,512 acres

Enhanced Army National Guard and Reserve requirements demand additional training land to support Homeland Security missions, such as, National Guard and Reserve Civil Support Teams, Home Land Response Force, Chemical Biological Radiological (CBR) Response Force Package (RFP).

The proposed action would support the Army plans and initiatives, defense and national security requirements, and Army force modernization initiatives. The proposed action would sustain Army and DOD mission requirements, potential future missions, while recognizing Army stewardship responsibilities within the southeastern United States.

The proposed action would provide the Army with greater flexibility in developing training missions and strategies in response to rapidly changing world conditions. It would allow the Army to provide a training environment that is better suited for current military needs.

This BE concludes that the proposed action ***may affect, but not likely adversely affect.***

- Smooth purple coneflower (*Echinacea laevigata*) - endangered
- Pondberry (*Lindera melissifolia*) - endangered
- Short-nosed sturgeon (*Acipenser brevirostrum*) - endangered
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Construction of Airborne Drop Zones and Forward Operating Bases (FOBs)

Currently, the Army proposes to develop 1 FOBs, and a Drop Zone (DZ).

Forward Operating Base (FOB)

In a tactical setting, FOBs are used by the Army as secure and safe locations for soldiers to sleep, eat, and maintain equipment. FOBs are located close to the enemy allowing soldiers rapid response to threat scenarios. FOBs are relatively easy to construct. During initial phases of FOB development, a FOB on SRS would have minimal life support systems (such as fixed kitchens, fuel points, and living quarters) in place for training units to support their training event. These support platforms would be brought with Army units for the duration of the training event. Training units will deploy to SRS as if they were deploying to a foreign nation. This trains units to be self sufficient during overseas deployments.

One of the FOBs, located on Gun Site 51, is located in the Supplemental RCW Management Area. This FOB would be situated on the remnants of old concrete building foundations of Gun Site 51. Gun site 51 is not actually a gun site, simply the name of what once was the site of an anti-aircraft facility used to protect the facility during many years ago. All that exists at Gun Site 51 are concrete building foundations. Gun Site 51 is relatively clear of trees and would not require clearance of large pines that might be suitable as RCW habitat. Small, hardwoods may have to be removed from around the old foundations for placement of FOB perimeter barriers; i.e., HESCO barriers. HESCO barriers are prefabricated, metal-mesh screen and fabric boxes. They are unfolded and filled with soil, which then allows the boxes to maintain their shape. The HESCO barriers are placed side by side to form a thick wall that is virtually impenetrable to large caliber bullets and anti-tank rockets. These barriers are easily emplaced or moved without much excavation of earth. The existing concrete foundations also provide a location where a FOB could be built without removal of RCW habitat. Gun Site 51 is the best location on SRS to build a FOB because it is free of contamination previously identified at other Gun Site locations on SRS and provides a “ready-made” base for tents, HESCO barriers, and various pieces of mobile Army equipment. Gun site 51, is located between Highway 125 (HWY 125) and roughly 0.5 miles west of L-Lake. A second FOB of similar design would be located in the vicinity of the industrial footprint of 484 D Power House. Construction on the D-Area FOB would not begin until after decommissioning efforts (of the power house?) have ended, on or about FY 2016.

Aircraft Drop Zones (DZs)

DZs are used by the Army to insert airborne forces by parachute from fixed and rotary wing aircraft. A DZ could also be used to exercise various cargo delivery systems, and as a Helicopter Landing Zone (HLZ). Minimum altitude for cargo and airborne operations is 1500 feet Above Ground Level (AGL). For DZ

construction, the Army initially proposed 6 locations for DZ construction. Construction would involve timber harvest, leveling of soil, and planting of grass to construct a DZ to standard. The USFWS has stated through USDA-SR that any DZ development on SRS should be discouraged because each DZ foot print was situated in RCW management and supplemental locations.

The USFS-SR provided an alternate location outside of the RCW management and supplemental locations for proposed DZ use. This DZ is situated near Water Gap Road, in Timber Compartment 44 of the Industrial Core Management Area. The proposed Water Gap road DZ location is acceptable to the Army as the location for a DZ. See page 15.

General

Army Environmental Protection and Responsibilities for Training on SRS

The U.S. Army Fort Gordon, which will oversee management of all Army training activities on SRS, is fully committed to protect Savannah River Site natural habitats, wetlands, and federally protected species of animals and fauna.

FGRC-SRS and the Army unit training on SRS is ultimately responsible for ensuring all tactical training is conducted so as not to destroy, pollute, or contaminate DOE-SR natural habitats and environments. FGRC-SRS will provide Range and Training Land Assessment (RTLA) through Integrated Training Area Management (ITAM) during all phases of the training activities. The driving documents for the protection of SRS environments are the JSOP, the Environmental Assessment (EA), and this BE.

Historical Data, Studies, Agreements, and Initiatives

Specific agreements between the DOE, DOE-SR, and Department of the Army, Fort Gordon were developed to ensure environmental compliance of federal, state, and local laws in protecting the environment.

In September of 2007, a MOU between the U.S. Department of the Army and DOE was signed for the use of SRS lands for military training activities.

In September of 2009, an IAG was signed between DOE-SR and Fort Gordon which established specific guidelines through the NEPA process in development of an EA of SRS lands for military training.

In October of 2009, in accordance with the IAG, funds were provided to SRS by ITAM Fort Gordon, for the development of an Environmental Assessment (EA) for specific Army training activities on SRS. Currently, the FGRC- Training Facility Coordinator (TFC) has been working closely with the SRS NEPA Coordinator in the development of the EA. By having the SRS NEPA coordinator develop the EA, an unbiased opinion of proposed training activities was developed.

The FGRC-TFC has provided SRS NEAP coordinator a list of proposed Army training activities. These activities will have certain restrictions. One of the key elements of the EA states that no tracked Army vehicles (tanks) or lethal ammunitions (fragmenting, projectiles, high explosive, etc.) will be allowed on SRS for Army training activities.

The FGRC-TFC has been working closely with the USFS-SR Wildlife Biology Supervisor, to develop procedures that restrict certain military activities from DOE-SR federally protected specie locations and USFS-SR activities. These procedures can be found in the draft copy of the JSOP and EA. The documents are available up request.

In August of 2010, the URS Corporation conducted a photo monitoring evaluation of SRS. URS photographed select locations of SRS to establish a baseline of the current condition of proposed SRS training locations. The evaluation considered vegetation, terrain, foot trafficability, line of site (distance),

and accessibility. After SRS has been substantially used by the Army, URS will reevaluate SRS to determine what types of maneuver damage has occurred, if any. URS can then advise ITAM resources on best management practices (BMPs) to protect the environment.

Community Outreach

As part of the Army's commitment to preserving the natural environment of SRS, the Army has presented its proposed training activity to the public, local industries, municipalities, and economic groups. The EA will be submitted for public review and comment.

Savannah River Citizens Advisory Board
Barnwell County Administrators
Barnwell County Regional Airport
Savannah River Community Reuse Organization
South Carolina DNR
Nuclear Solutions (Barnwell)
Southeast Management Association
Plant Vogtle
Barnwell County
Savannah River Emergency Services
Government Training Institute, Barnwell
Georgia DNR

Savannah River Nuclear Solutions (SRNS) Interface Management Team (IMT) Meeting

SRNS chairs a monthly meeting, which all site tenant organizations attend to discuss ongoing projects, safety, and events. This venue has been used to discuss proposed Army training activities and concerns presented by the IMT to the Army representative.

Annual Training Plan

The FGRC-TFC will provide an annual training plan that outlines all training events for that fiscal year. The annual plan will allow advance planning and coordination between the Army, USFS-SR, and SRNS to prevent and reduce interference with ongoing USDA and USFS activities.

90 Day Notifications

In most cases, the FGRC-TFC, will notify the USFS-SR at least 90 days in advance of a proposed training event. This will allow the USFS-SR sufficient time to address concerns in proposed training lands on SRS.

60 Day Scheduling and Training Coordination Meeting

The 60 day scheduling and training coordination meeting is designed to facilitate and outline the training requirements for the Army. DOE-SR organizations, in particular, the USDA-USFS-SR will be invited to each 60 day meeting. The FGRC-TFC will provide a draft of the proposed training exercise(s) to all tenant organizations in attendance. This will allow tenant organizations to address concerns and at the same time better define Army training locations.

30 Day Unit Coordination Packet Submission to DOE-SR and the FGRC - TFC

A unit coordination packet of the proposed training event will be completed by the Army Unit and returned to the TFC such that the TFC may provide a finalized "Roll Up" of the proposed training exercise to the DOE-SR no later than 30 working days prior to the first day of training. The proposal should not be substantially changed from the 60 day proposal and will reflect any adjustments made after the final resolution of the 60 day review comments.

Specific data which may be of interest to the USFS-SR is:

- Equipment List.
- Training Ammunition List.
- Access and Egress points.
- DOE-SRS Aviation Overflight Approval Request.
- Approved, unmarked 1:50,000 SRS Site Map(s).
- Exact training locations and facilities proposed for training.

Because of ongoing operations in South West Asia, Army units may request training opportunities within the 90, 60, 30 day planning period. Approvals of these short notice events are dependent upon consideration and approval by DOE-SR.

The USFS–SRS and Savannah River Ecology Lab (SREL)

The USFS-SR and SREL conduct various forest management, ecological, and environmental studies throughout SRS. Most of these studies have been ongoing since SRS was first created in the early 1950s. Therefore, years of environmental study and ongoing environmental research is critical to the protection of SRS wildlife, habitats, and federally protected species throughout the southeastern United States. The Army's desire is for these activities to continue in order to preserve the natural environment on SRS. Therefore, the Army is committed to as much interaction as possible to protect SRS natural habitat.

GIS Operations

The Fort Gordon ITAM Geographic Information System (GIS) Analyst has been working closely with USFS-SR GIS personnel to receive environmental data that was used to develop the EA and JSOP procedures. Some of the data received includes:

- RCW management Area
- Sensitive Plant Ranges
- Eagle Territorial Management Zones
- Archeological Sites
- Lakes, Wetlands, and Carolina Bays
- Contaminated areas
- DOE-Set Aside Areas
- No walk and access areas
- Cemeteries
- Waste Management Units

GIS data has been an extremely valuable tool in the development of a USFS – SRS Military Activity Map and Environmental Control Map, which define specific locations that are off limits to Army training activities. Maps will also be used to tailor each specific Army training activities such that they will not adversely affect SRS federally protected species. The Environmental Control Map will be updated as required.

Restricted Army Activities

Currently, the JSOP and EA prohibit the use of lethal ammunition or tracked vehicles, which are the most common activities that typically have the greatest impact to the natural environment.

Authorized Army Activities (Evaluation of Effects)

In general, Army training activities are limited to light infantry maneuver (foot traffic), wheeled vehicles, Army aviation, and training ammunition. Wheeled vehicles will be restricted to roads, improved graveled

roads which traverse throughout the site, or roads which are capable of handling military vehicles. These roads will be identified during the 60 /30 coordination meeting. Trails will only be used for foot traffic and not military vehicles. Roads and trails frequently used by the army will be alternated to reduce erosion of surface dirt and material.

Training ammunition will be used to simulate combat events. Examples of training ammunition are blanks, pyrotechnics, and simulated explosive devices. These training munitions do not fragment and when used in a safe environment will not directly impact natural resources. All expended training ammunition and residue will be policed by the Army prior to leaving SRS. Restrictions on certain training ammunitions have been implemented near certain federally protected specie locations. A good example is the RCW Management Area, referenced in this BE. Training activities may include the following:

- Light Infantry / SOCOM (Special Operations Command) Forces
- Air Assault Operations
- Reconnaissance / Surveillance
- Casualty Evacuation
- Airborne Operations
- Aerial Cargo Delivery
- Convoy Operations
- Combined air, land, and water operations (Infil and Exfil)
- Opposition Forces (OPFOR) (Insurgents)
- Urban / Military Operations on Urban Terrain (MOUT) Operations
- Fire Support (Towed)
- Rotary Wing Attack Aircraft Operations
- Special Operations Forces
- Force Protection – Weapons of Mass Destruction WMD), Chemical Biological (CBR), Nuclear Biological Chemical (NBC), in a training capacity, no active test agents or simulants will be used)
- FOB Operations
- Forward Air Refueling Point (FARP) Operations
- Refuel Operations (ROM)
- Unit Maintenance Collection Points (UMCP)
- Tactical Operations Centers (TOCs/CPs)
- Improvised Explosive Device (IED) / Vehicle Born IED / Homicide Bomber
- Breaching Operations (surface only, simulated explosives)
- Digging Operations in designated locations

Training Area Pre-Inspections

The FGRC-TFC will conduct a pre-inspection of all proposed training areas and facilities prior to Army units arriving on DOE-SR. The FGRC-TFC will notify the USFS-SR of any damage to forested areas and terrain found during the pre-inspection, not caused by the Army. During the pre-inspection, the FRGC-TFC will attempt to identify possible presence of federally protected specie that may have occupied locations inside Army training locations and not previously found on SRS.

Daily Training Area Inspections

FGRC-SRS personnel will inspect all Army training areas and facilities to identify maneuver damage caused by the military unit. At least than 3 days prior to units leaving DOE-SR, units will begin to repair maneuver damage such as rutting and trash removal.

Refueling Operations

Refueling operations are authorized on SRS. See Chapter 5, JSOP, for specific refueling procedures. Refueling is prohibited within 200 feet of protected species sites and wetlands.

Fuel Spills

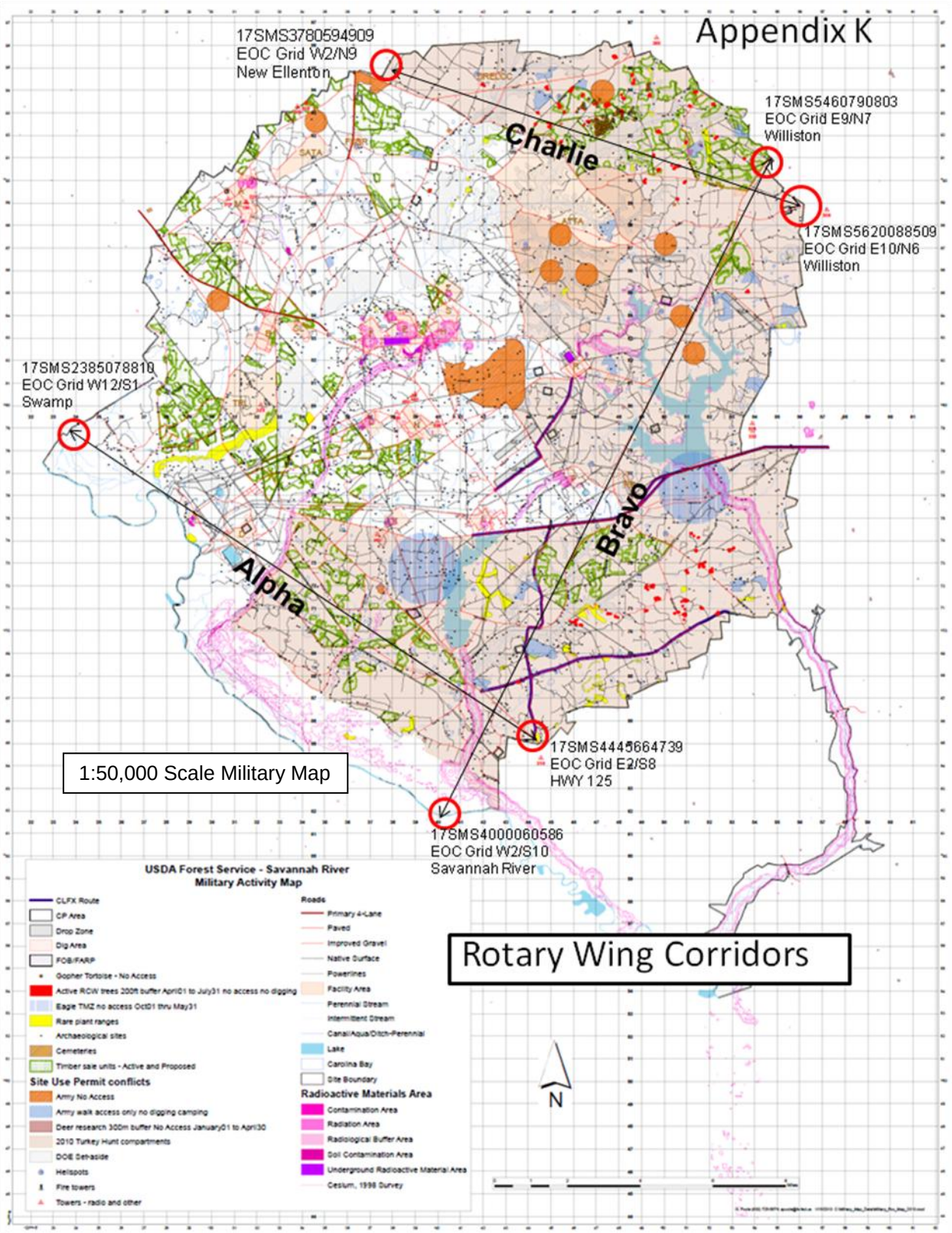
Units will immediately report all fuel spills on roads and training areas to FGRC-SRS. FGRC-SRS will notify SRSOC immediately of all spills regardless of size and if assistance is required for hazardous material recovery. Units should have dry fuel spill kits or dry sweep on hand to remove fuel spills from hard surfaced roads. Fuel spills in training areas or unimproved roads will be dug up, triple bagged, and removed from SRS by the unit.

Trash

Trash will be collected by the unit and disposed of using dumpsters or taken to Three Rivers Landfill.

Black Water

Units will use Port-a-lets for the disposal of human waste.


Appendix K
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HWY 125
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EOC Grid W2/S10
Savannah River
Charlie
Bravo
Alpha
1:50,000 Scale Military Map
Rotary Wing Corridors
USDA Forest Service - Savannah River
Military Activity Map
CLFX Route
CP Area
Drop Zone
Dig Area
FOB/FARP
Gopher Tortoise - No Access
Active RCW trees 200ft buffer April01 to July31 no access no digging
Eagle TMZ no access Oct01 thru May31
Rare plant ranges
Archaeological sites
Cemeteries
Timber sale units - Active and Proposed
Site Use Permit conflicts
Army No Access
Army walk access only no digging camping
Deer research 300m buffer No Access January01 to April30
2010 Turkey Hunt compartments
DOE Setaside
Hellspots
Fire towers
Towers - radio and other
Roads
Primary 4-Lane
Paved
Improved Gravel
Native Surface
Powerlines
Facility Area
Perennial Stream
Intermittent Stream
Canal/Aqua/Ditch-Perennial
Lake
Carolina Bay
Site Boundary
Radioactive Materials Area
Contamination Area
Radiation Area
Radiological Buffer Area
Soil Contamination Area
Underground Radioactive Material Area
Cesium, 1998 Survey
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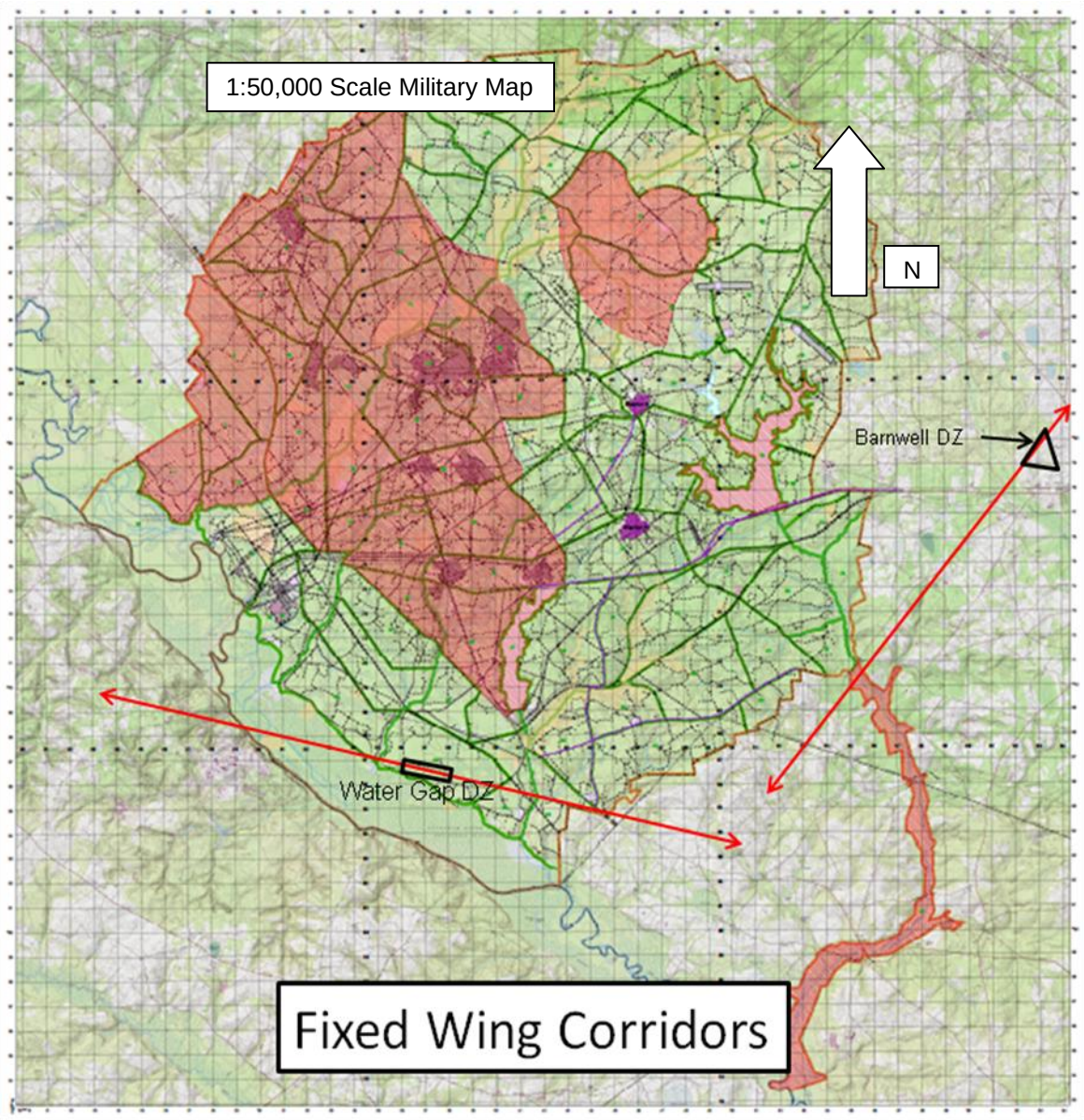
1:50,000 Scale Military Map
N
Barnwell DZ
Water Gap DZ
Fixed Wing Corridors

The Red-cockaded Woodpecker

Basic Ecology and Population Dynamics

Red-cockaded woodpeckers are a cooperatively breeding species, living in family groups that typically consist of a breeding pair with or without one or two male helpers. Females may become helpers, but do so at a much lower rate than males. The ecological basis of cooperative breeding in this species is unusually high variation in habitat quality, due to the presence or absence of a critical resource, the cavities that red-cockaded woodpeckers excavate in live pines. Cavity excavation may take years to complete (RCW Recovery Plan 1979).

Red-cockaded woodpeckers exploit the ability of live pines to produce large amounts of resin by causing the cavity tree to exude resin through wounds, known as resin wells that the birds keep open. This resin creates an effective barrier against climbing snakes. Longleaf pine is a preferred tree species for cavity excavation because it produces more resin for a longer period of time than other southern pines. Group living has a profound influence on RCW population dynamics. In noncooperatively breeding birds, breeders that die are replaced primarily by the young of the previous year. Thus, variation in reproduction and mortality can have strong, immediate impacts on the size of the breeding population. However, in RCWs and other cooperative breeders, a large pool of helpers is available to replace breeders. As a result, the size of the breeding population is not strongly affected by how many young are produced each year, or even on how many breeders may die. Therefore, the number of potential breeding groups (PBG) rather than number of individuals is used as the measure of population size. A PBG comprises an adult female and adult male that occupy the same cluster, with or without helpers, regardless of whether they attempt to nest or successfully fledge young (RCW Recovery Plan).

Habitat Requirements and Limiting Factors

Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat (clusters). Large old pines are required as cavity trees because the cavities are excavated completely within inactive heartwood, so that the cavity interior remains free from resin that can entrap the birds. Also, old pines are preferred as cavity trees, because of the higher incidence of heartwood decay that greatly facilitates cavity excavation. Cavity trees are in open stands with little or no hardwood midstory and few or no hardwoods. Hardwood encroachment resulting from fire suppression is a well-known cause of cluster abandonment. Red-cockaded woodpeckers also require abundant foraging habitat. Suitable foraging habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods (RCW Recovery Plan).

Research shows that RCWs in native ground cover are more productive. Limiting factors are those that directly affect the number of PBGs because this is the primary determinant of population size and trend. Several factors currently impact the persistence of PBGs. Foremost among these are the factors that limit suitable nesting habitat, namely fire suppression and lack of suitable cavity trees. Fire suppression has resulted in loss of PBGs throughout the range of the RCW, because the birds cannot tolerate the hardwood encroachment that results from lack of fire. This limitation is addressed through the use of frequent prescribed burning, with most burns conducted during the growing season because growing season fires are more effective at killing hardwoods. Lack of cavity trees and potential cavity trees limits the number of PBGs in most populations. This limitation is addressed in the RCW Recovery Plan Executive Summary. In the short term, cavity management tools such as artificial cavities and restrictor plates will stabilize and increase RCW populations. Over the long-term, managing for abundant large old trees will ensure that there are sufficient suitable cavity trees. Another factor directly limiting the number of PBGs is habitat fragmentation and consequent isolation of groups, which results in disrupted dispersal of helpers and failure to replace breeders. This limitation is best addressed through the appropriate placement of clusters of artificial cavities, and implementation of silvicultural practices that minimize fragmentation such as single or small group tree selection. There are several other threats to the existence and recovery of the species that do not limit most population, but which will become more

important as the current limitations are addressed. Chief among these are (1) degradation of foraging habitat through fire suppression and loss of mature trees, and (2) loss of valuable genetic resources because of small size and isolation of populations (genetic drift and inbreeding). As limiting factors such as lack of cavities are relieved, the continued growth and natural stability of RCW populations will depend on abundant, good quality foraging habitat and careful conservation of genetic resources (RCW Recovery Plan).

Population and Species Viability

Four types of threats to species and population viability have been identified: genetic stochasticity (consisting of both inbreeding and genetic drift), demographic stochasticity, environmental stochasticity, and catastrophes. We now have some knowledge of population sizes of RCWs necessary to withstand these extinction threats, primarily from research performed with a spatially explicit, individually based simulation model of population dynamics developed specifically for this species (RCW Recovery Plan).

Red-cockaded woodpeckers exhibit inbreeding depression and inbreeding avoidance behaviors. Effects of demographic stochasticity on population viability vary with the spatial arrangement of groups. Populations as small as 25 PBGs can be surprisingly resistant to random demographic events, if those groups are highly aggregated in space. Populations as large as 100 potential breeding groups can be impacted by demographic stochasticity, if groups are not aggregated and dispersal of helpers is disrupted. Demographic stochasticity is not expected to affect populations larger than 100 PBGs. Similarly, effects of environmental stochasticity vary with the spatial arrangement of groups (RCW Recovery Plan).

Loss of genetic variation through the process of genetic drift is an inevitable consequence of finite population size. New genetic variation arises through the process of mutation. In large populations, mutation can offset loss through drift and genetic variation is maintained. Just how large a population must be to maintain variation is a difficult question. Currently, researchers recognize that in general, only populations with actual sizes in the thousands, rather than hundreds, can maintain long-term viability and evolutionary potential in the absence of immigration. However, if populations are connected by immigration rates on the order of 1 to 10 migrants per generation (0.5 to 2.5 migrants per year); the genetic variation maintained by these populations is equal to that of 1 population as large as the sum of the connected populations. Thus, sufficient connectivity among populations can maintain genetic variation and long-term viability for the species (RCW Recovery Plan).

Reasons for Listing

The RCW was listed as endangered in 1970 (35 Federal Register 16047) and received federal protection with the passage of the ESA in 1973. Once a common bird distributed continuously across the southeastern United States, by the time of listing the species had declined to fewer than 10,000 individuals in widely scattered, isolated, and declining populations. This precipitous decline was caused by loss of habitat. Fire maintained old growth pine savannahs and woodlands that once dominated the southeastern United States and on which the woodpeckers depend, no longer exist except in a few small patches. Longleaf pine (*Pinus palustris*) ecosystems, of primary importance to RCWs, are now among the most endangered ecosystems on earth. Mature shortleaf (*P. echinata*), loblolly (*P. taeda*), and slash pine (*P. elliottii*) ecosystems, important to RCWs outside the range of longleaf, also have suffered severe declines. Loss of the original pine ecosystems was primarily due to intense logging for lumber and agriculture. Logging was especially intense at the turn of the century. Two additional factors resulting in the loss of original pine systems in the 1800s and earlier were exploitation for pine resins and grazing by free-ranging hogs (RCW Recovery Plan).

Later, in the 1900's, fire suppression and detrimental silvicultural practices had major impacts on primary ecosystem remnants, second-growth forests, and consequently on the status of RCWs. Longleaf pine suffered a widespread failure to reproduce following initial cutting, at first because of hogs and later because of fire suppression (RCW Recovery Plan).

RCW on Military Military Installations

Current Status and Trends
At present there are 15 military installations harboring red-cockaded woodpeckers (see map insert and Table 7), ranging from 1 active cluster on Charleston Naval Weapons Station to 301 active clusters on Eglin Air Force Base and 350 active clusters on Fort Bragg. (RCW Recovery Plan)
The Fort Bragg Natural Resources Team (NRT) won a Secretary of the Army Sustainability Award in 2008, which was presented by the USFWS RCW Recovery Program Awards for outstanding accomplishments contributing to the successful recovery of the federally-listed RCW (FY 2009 Secretary of Defense Environmental Awards).

Fort Stewart, one of the closest military installations to SRS, is located in Hinesville, Georgia, and is home to the 3rd Infantry Division. Fort Stewart supports 4 brigades of M1A1 tanks, Bradley fighting vehicles and an assortment of fixed and rotary wing aircraft as well as other heavy wheeled support vehicles. Fort Stewart also supports hundreds of National Guard, reserve, and armed services units such as naval, marine, and law enforcement units. Fort Stewart is currently has 337 active RCW clusters and 325 PBGs (See attached slide page 25).

Rates of increase reported from Marine Corps Base Camp Lejeune and Fort Stewart during the 1990's are among the highest yet documented (in the absence of translocation), an encouraging result of intensive, well-planned, and well-executed management (RCW Recovery Plan).

Army RCW Responsibilities

The U.S. Army is one of the lead stewards in RCW conservation. Since implementation of the ESA, the Army has contributed immensely to the conservation of RCW habitat, protection of clusters, and provides critical awareness training to soldiers to assist in protecting and enforcing RCW management policies. Forts Gordon and Stewart, GA are examples of the Army's successful management of RCW populations See RCW population growth charts on pages 22 – 24 for both Army installations.

Provided with this BE are four documents which address management practices and studies of military training on prime RCW habitat located at Fort Stewart, Georgia.

The first document is provided by Larry Carlisle, Fort Stewart, Georgia, Fish and Wildlife Biologist titled, *"Success of the Army's 1996 Red-Cockaded Woodpecker Guidelines."* The reason for providing this information is to address how the Army strives to preserve the habitat, not only of the Red-cockaded woodpecker, but of other species of animals. At the same time, provide critical training land for commanders charged with the responsibility of training their soldiers to the highest standards. The reader should grasp the incredible amount of dedication, time, and effort into protecting RCW habitat on Fort Stewart.

The second document is from the U.S. Army Corps of Engineers (USACE), Engineer Research and Development Center, Final Report titled, "*Assessment of Training Noise Impacts on the Red-cockaded Woodpecker"*. The purpose of this research was to assess the effects of military training noise on the endangered Red-cockaded Woodpecker (RCW) and to develop assessment methodology. Experiments tested RCW response in 1999 and 2000 (during the breeding season) to controlled military training noise events under realistic conditions, namely .50-caliber blank fire and artillery simulators. From 1998-2000, passive (i.e., no control over the noise source) monitoring of RCW response to various military training noise events. Measuring of both proximate response behavior and nesting success, while continuing to measure baseline behavioral data from undisturbed RCW groups. Measured levels of experimental noise did not affect RCW nesting success or productivity. RCW flush response increased as stimulus distance decreased, regardless of stimulus type. It is important to note that woodpeckers returned relatively quickly after flushing from the nest, with return times being comparable between 1999 and 2000 rates. Un-weighted noise levels within RCW nest cavities were substantially louder than levels recorded at the base of the tree. When noise data were examined using Woodpecker weighting (dBW), noise levels inside nest cavities were not significantly different compared with levels recorded outside the nest cavity. This report

provides definitive proof that RCW habitat can coexist in the midst of one the south east's largest military installations, Fort Stewart, located in Liberty County, Georgia. Fort Stewart is home to the U.S. Army's 3rd Infantry Division (3ID). The 3ID provides live fire and maneuver training land for hundreds of tanks, Bradley fighting vehicles, self propelled artillery, and various aviation fixed and rotary wing aircraft. This report studied the effects of various weapons fire, vehicle, and aircraft traffic near RCW populations. Some of these weapons included large caliber direct fire weapons. Blank weapons fire and pyrotechnic simulators were also used as part of the study. It is important to note that these same blank weapons and pyrotechnic fire is proposed for used at SRS. As different noises from weapons, aircraft, and vehicles were introduced to RCW nests at varying distance, the RCW nest was monitored to see if the bird flushed and if the bird returned. This report proves for those birds that flushed, all returned to their nests or adjusted to the presence specific training activities, which includes very large caliber weapons. The conclusion states, *during this study we observed and documented experimental training noise events and the resulting RCW responses under realistic conditions. Both proximate response behavior and nesting success were measured. We also observed RCW behavior and nesting success for groups where noise stimuli were absent or minimal (near or below ambient sound levels), to provide an undisturbed behavior baseline to judge response and impact against. No significant differences in nesting success or productivity were found between experimentally disturbed and relatively undisturbed RCW groups.*

The third document is also from the USAEC, titled, "Assessments of Effects of Maneuver Training Activities of Red-cockaded Woodpecker Populations of Fort Stewart, Ga." Results from this study on Fort Stewart, Georgia during 1997-1999 indicate that demographic factors (e.g., group size and prior reproductive success) have more effect on RCW reproductive success than habitat and/or disturbance from human activities. The conclusion states, *population viability modeling indicates that at the present time potential disturbance effects in this small proportion of the population have negligible effect on the viability of the Fort Stewart RCW population.* An important part of this study shows virtually no effect to RCW habitat during nesting and non-nesting periods in relation to military activity.

The Fourth document is an aerial photo which shows the TES species which have been observed on Fort Stewart training lands and water ways. They are the RCW, wood stork, short nosed sturgeon, bald eagle, and gopher tortoise. Most notably presented on the photo are the numerous RCW trees which are prevalent throughout Fort Stewart. A significant amount of these trees are found adjacent to or directly inside the installation artillery impact areas (AIA) and small arms impact area (SAIA). This is definitive proof that RCW adapt and adjust to the presence of very large and very loud military weapons systems.

RCWs on the SRS

The SRS was divided into 3 management areas per the SRS RCW Management Plan. They are the RCW Management Area, the Supplemental RCW Management Area, and other use areas in which timber management and facility development will be given priority (page 20) Red-cockaded woodpeckers will not be actively managed in this area (US-DOE NRMP May 2005).

SRS Habitat Management Areas

SRS RCW Management and Monitoring

US Department of Agriculture Forest Service – Savannah River Site (USFS-SR) manages the natural resources at the SRS. Specific Resource management objectives and strategies are described within the SRS Natural Resource Management Plan and associated operations plans (USFS-SR 2005).

RCW breeding occurs April through July. Translocations of juvenile RCWs occur in the fall of the year but would only occur approximately once during the year. The USFS-SR bands RCW nestlings. RCW cavity trees are marked painted with a single white or yellow band (U.S. Army / DOE JSOP) (RCW Recovery Plan).

Description of the RCW Population on SRS

The RCW population at SRS consisted of 50 active groups during the 2008 breeding season. An analysis of current suitable habitat conditions, given current rotation lengths and thinning strategies, suggests that the short-term population objective will not be limited by habitat.

The SRS RCW population is identified as 1 of 10 secondary core populations in the RCW Recovery Plan. For the RCW to be de-listed, 9 of the 10 secondary core populations must establish a viable population of 250 PBGs, without dependence on the installation of artificial cavities. Because not all PBGs breed each year, 275 to 350 total PBGs are needed to achieve minimum viable population size of 250 PBGs. To meet these goals, a long-term target of 418 PBGs was set. In the role of a secondary core population, RCWs from the SRS are available to augment or to enhance the genetic diversity of other RCW populations and to provide onsite research opportunities to address questions of region-wide interest. SRS will serve as a repository for mitigated RCWs and provide suitable habitat for birds dispersing from nearby populations. USFWS recommends that federal properties with adequate habitat to support more than 250 PBGs establish population goals based on the potential carrying capacity of their properties.

The RCW Management Area contains 65,140 acres of potentially suitable habitat for the RCW and the Supplemental RCW Management Area contains 32,981 acres of potentially suitable habitat. The carrying capacity in the RCW Management Area was established at 326 (65140/200=325.7) groups, assuming a density of 1 RCW per 200 acres of suitable habitat; the Supplemental RCW Management Area has a carrying capacity of 123 109 (32981/300=109) groups, assuming a density of 1 group per 300 acres.

The lower expected density in the Supplemental RCW Management Area is based upon the shorter timber rotation, lower fire frequency, etc., resulting in lower habitat quality, and therefore, larger territory sizes. The population objective is slightly less than the expected carrying capacity in each management area to provide for habitat variability and flexibility for future land use. The remainder of the SRS is not expected to support any RCW groups. Based upon the current population and a 5% growth rate, the SRS recovery objective is projected to be met within about 50 years (B.E. for RCW, Ray 2009).

SRS POPULATION AND NESTING MANAGEMENT

There are no changes in operational population and nesting habitat management because of the proposed Army training activities (B.E. for RCW, Ray 2009).

SRS RCW FORAGING HABITAT

Current RCW forage requirements for federal lands are specified in the RCW Recovery Plan (p. 186-197) and the USFWS 2005 Memorandum “Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: *Second Revision* 2005.”

Foraging habitat must be contiguous (not being separated from the cluster center by more than 200 feet of non-foraging areas) within 0.5 miles of the cluster center, and at least half (i.e., 60 acres) should be within 0.25 miles of the cluster center. Management activities will be implemented to move the current habitat conditions toward the desired future conditions for RCW foraging habitat described below (B.E. for RCW, Ray 2009).

SRS Objective: Improve RCW group fitness by providing 120-200 acres of foraging habitat per RCW group (B.E. for RCW, Ray 2009).

SRS Strategy: Employ silvicultural systems and techniques to move the foraging habitat toward the desired future condition for forage. (B.E. for RCW, Ray 2009)

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2007 Management Guidelines for the Red-cockaded Woodpecker on Army Installations

The purpose of these guidelines are to provide standard Red-cockaded Woodpecker (RCW) management guidance to Army installations for developing endangered species management components (ESMCs) for the RCW as part of an installation’s integrated natural resource management plan (INRMP). Terminology has been revised from endangered species management “plans” to

"components" to reflect that endangered species management on installations is an integral component of natural resource management activities on Army installations. Installation RCW ESMCs will be prepared according to these guidelines and chapter 11, AR 200-3, Natural Resources – Land, Forest, and Wildlife Management and subsequent policies and guidance published by the Army. These guidelines establish the baseline standards for Army installations in managing the RCW and its habitat. Installation RCW ESMCs will supplement these guidelines with detailed measures to meet installation-specific RCW conservation needs and unique military mission needs. The requirements in RCW ESMCs will apply to all activities on the installation.

The guidelines are applicable to Army installations where the RCW is present. These guidelines replace 1996 Management Guidelines for the Red-cockaded Woodpecker on Army Installations, 30 October 1996.

These guidelines are revised as necessary to be consistent with the 2003 U.S. Fish and Wildlife Service (USFWS) RCW Recovery Plan and to incorporate the latest and best scientific data available. These guidelines are the third major revision. Previous guidelines were dated 30 October 1996, 21 June 1994 and 1986.

The Army's goal is to implement management guidelines which will allow the Army to accomplish military readiness missions while concurrently developing and implementing methods to assist in the conservation, down listing, and recovery of the RCW.

Installation and tenant unit mission requirements do not justify violating the ESA. Mission considerations are necessary in determining the installation management and recovery goals. The keys to successfully balancing mission and conservation requirements are long term planning and effective RCW management to prevent conflicts between these interests.

How the Army protects RCW habitat on SRS will be slightly different than as outlined in the 2007 Red-cockaded woodpecker guide lines. Most soldiers are familiar with training in and around RCW habitat. Therefore, the protection of RCW clusters and cavity trees will not be hard to manage (2007 Army RCW Guidelines).

Marking of Cavity Trees on SRS

Cavity trees on SRS are marked with a single white or yellow band, which is different from how Army Installations mark RCW cavity trees with two white bands. Some, but not all, RCW clusters on SRS are identified by with signs depicting a RCW (U.S. Army / DOE JSOP) (Draft EA, 2010) (B.E. for RCW, Ray 2009).

Military Training Restrictions for the RCW on the SRS

The best way for Army units to identify RCW cavity trees is through education during the unit orientation briefing prior to commencement of training. Units will also be provided locations of RCW clusters during the orientation (U.S. Army / DOE JSOP) (Draft EA, 2010).

The Army guidelines for training within RCW habitat allows certain activities to occur with 200 feet of a cavity tree. Because there is 120,000 acres of land available for training, the FGRC-TFC has amended the guidelines to meet SRS RCW growth and protective actions for RCW habitat. Once additional RTLA is budgeted for SRS, proper signage and tree markings for RCW habitat should be initiated on SRS to meet 2007 RCW Army Guidelines. The FGRC-TFC has restricted all training within 200 feet of any RCW cavity tree (U.S. Army / DOE JSOP) (Draft EA, 2010).

The purpose of training restrictions associated with RCW clusters is to avoid or minimize the potential for "take" as defined under section 9 under the ESA. At the same time, this restriction imposed by the FGRC-TFC, should not affect training activities for commanders charged with the training of soldiers.

Blank ammunition will not be used within the 200 feet of RCW cavity trees. All soldiers participating in training on SRS will be instructed on the presence of the RCW habitat and modifications of guidelines imposed by the FGRC-TFC (U.S. Army / DOE JSOP) (Draft EA, 2010).

Soldiers will be provided with a brochure that describes all TES on SRS; foremost will be the RCW and its habitat. Maps detailing RCW habitat will be issued to units prior to arrival at SRS. This will allow units to develop training strategies around RCW clusters.

Military training within marked cavity tree buffer zones is limited to military activities of a transient nature. Military vehicles are prohibited from occupying a position or traversing within 200 feet of a marked cavity tree, unless on an existing road. Soldiers on foot may transit through RCW 200 foot buffers but are not allowed to stop for any reason (U.S. Army / DOE JSOP) (Draft EA, 2010).

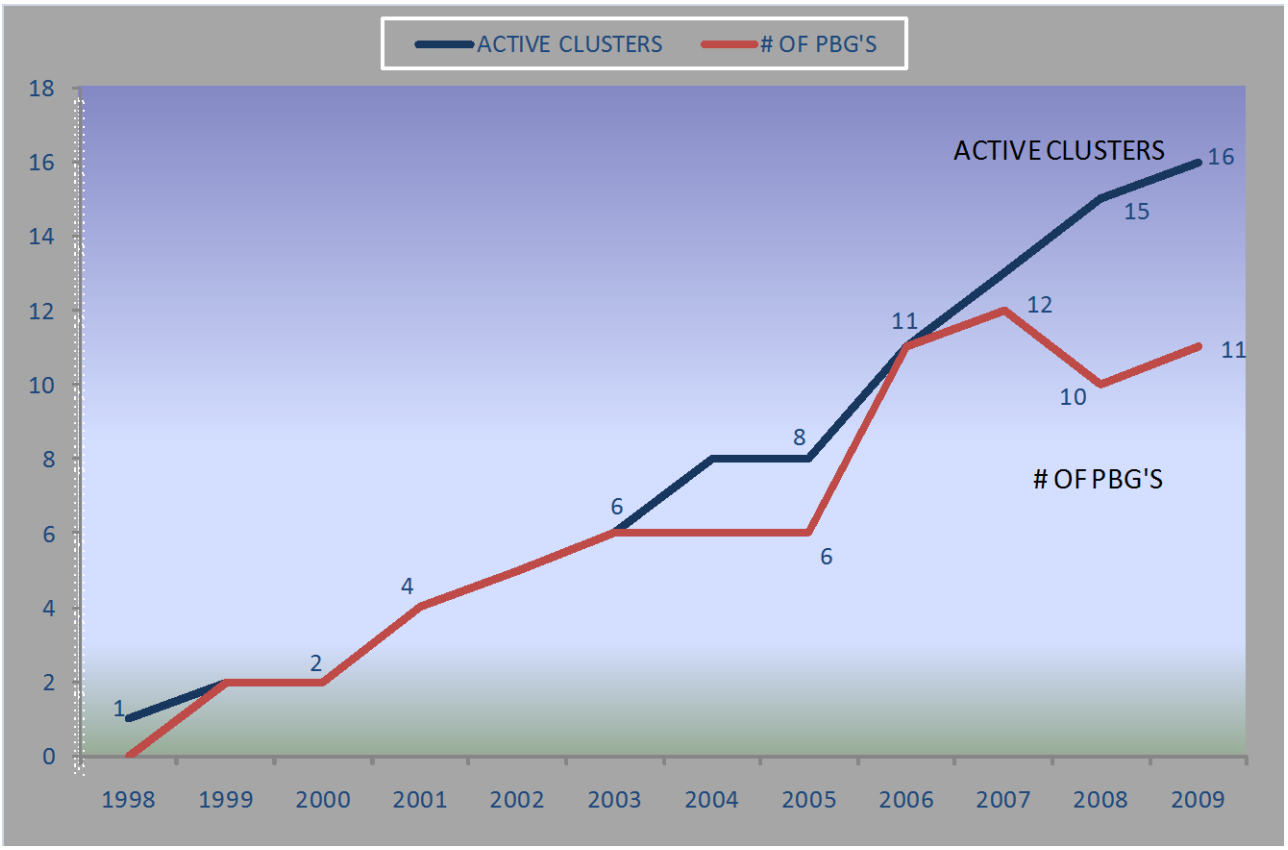
Aside from what is written in the JSOP and Draft EA for Army training on SRS; the Red-Cockaded Recovery Plan Guidelines to protect existing cavity trees recommends reducing human disturbance as much as possible, but recommends restricting vehicle use to existing roads and avoiding construction of new roads and trails (for motorized and un-motorized use) within clusters (RCW Recovery Plan).

Military personnel are prohibited from cutting down or intentionally destroying pine trees unless the activity is approved previously by the SRS biologist and/or forester and is authorized for tree removal. Hardwoods may be may not be cut and used for camouflage or other military purposes. Only manmade camouflage netting will be used (U.S. Army / DOE JSOP).

Units will immediately report to FGRC personnel on SRS, known damage to any marked cavity or cavity start tree and/or any known extensive soil disturbance in and around RCW clusters. Training units will as soon as practicable (normally within 72 hours) repair damage to training land within a cluster to prevent degradation of habitat.

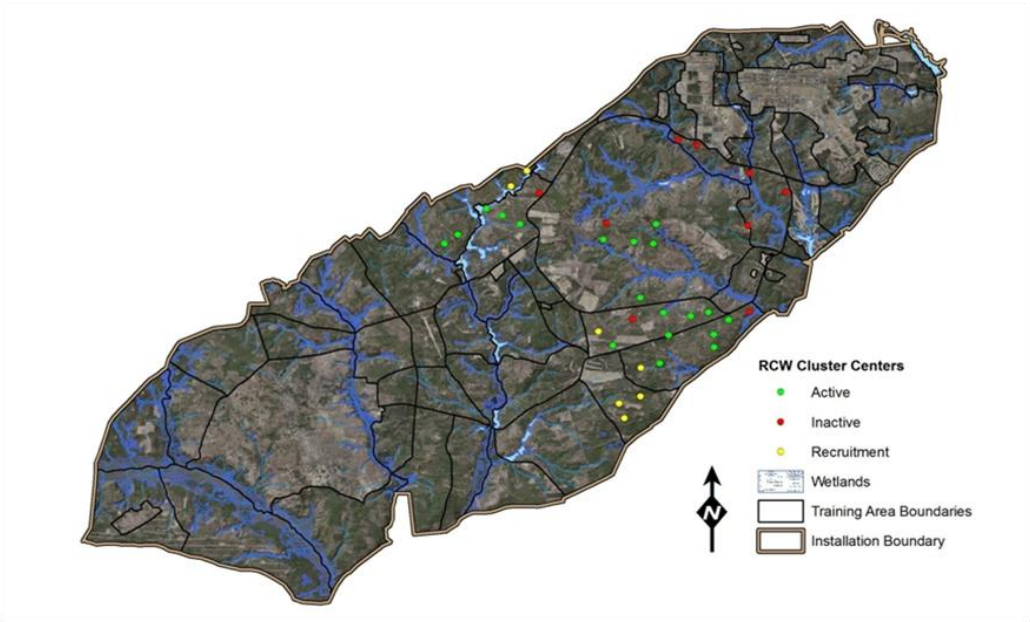
Digging on SRS is authorized in approved locations. All digging for military training activities in suitable acreage will be filled within a reasonable time after the completion of training. Training Guidelines will be actively enforced through installation training and natural resources enforcement programs, the SRS EA, the JSOP, and training activities coordinated and approved by DOE-SR (U.S. Army / DOE JSOP) (Draft EA, 2010).

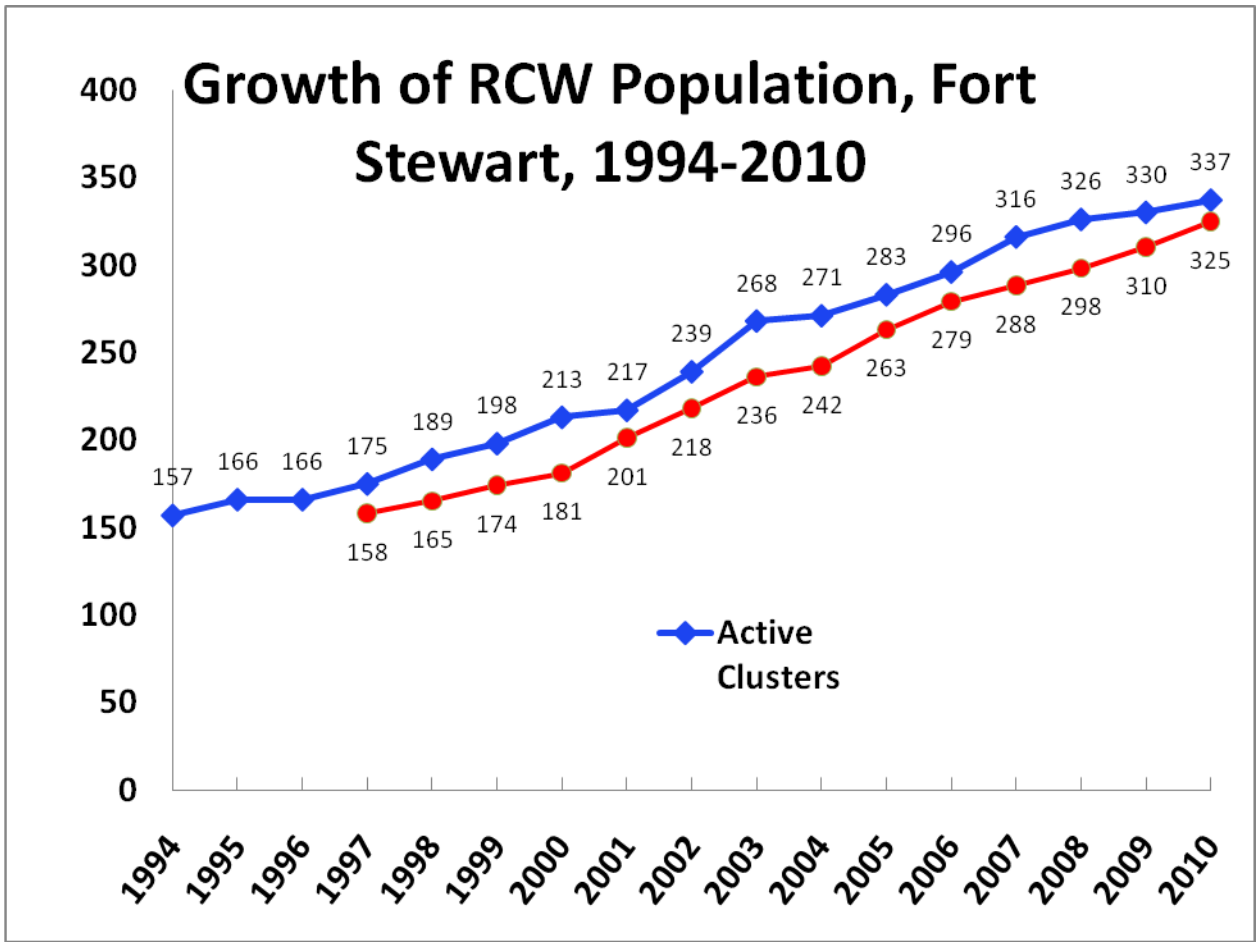
Fort Gordon Red-Cockaded Population Growth

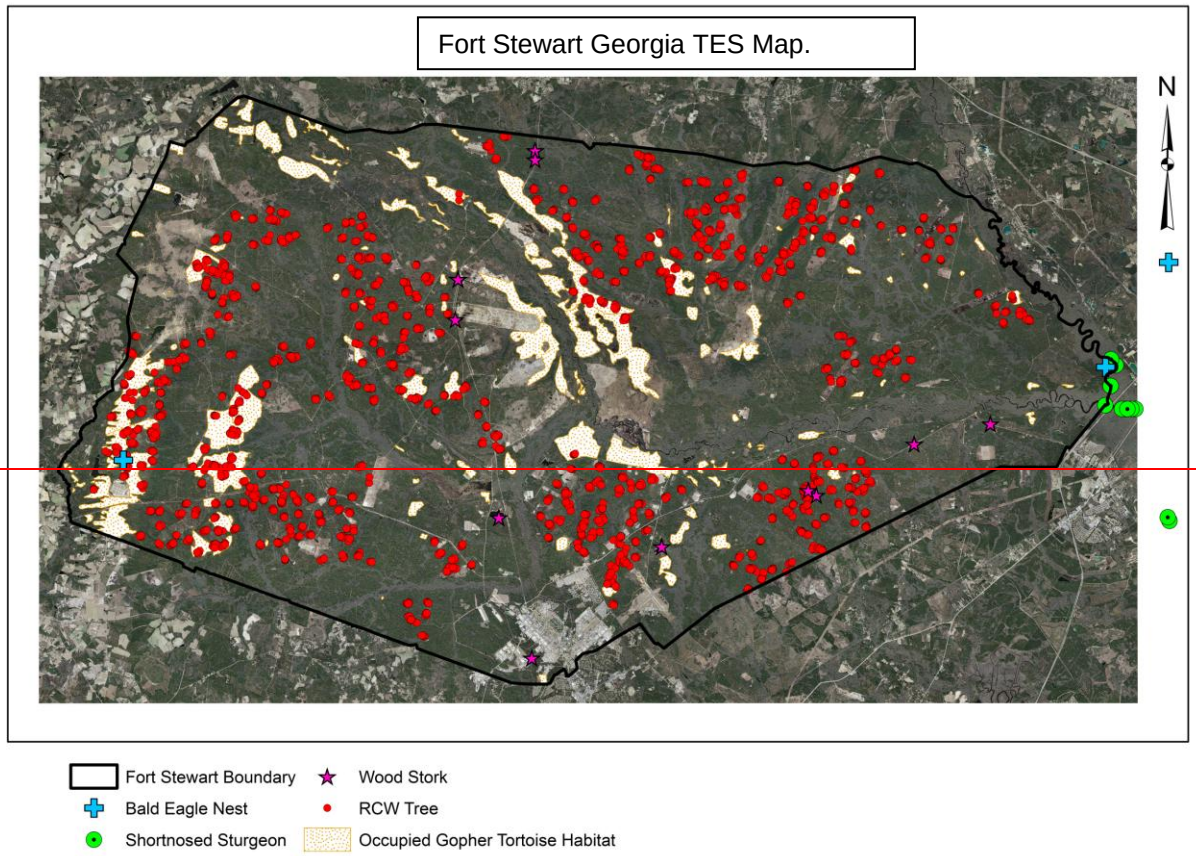


Current 2010 population metrics have increased to 13 PBGs and 19 active clusters.

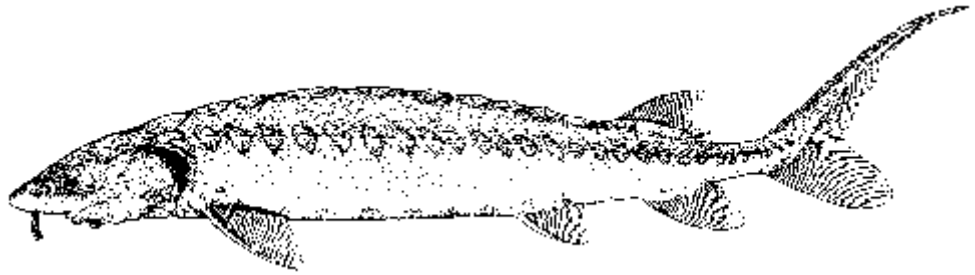
Fort Gordon Red-Cockaded Woodpecker Clusters




Growth of RCW Population, Fort Stewart, 1994-2010
400
350
300
250
200
150
100
50
0
157
166
166
175
189
198
213
217
239
268
271
283
296
316
326
330
337
158
165
174
181
201
218
236
242
263
279
288
298
310
325
Active Clusters
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010


Fort Stewart Georgia TES Map.
N
Fort Stewart Boundary
Wood Stork
Bald Eagle Nest
RCW Tree
Shortnosed Sturgeon
Occupied Gopher Tortoise Habitat

The Shortnosed Sturgeon



Shortnosed Sturgeon research was developed by consulting with Dr. Stephania Bolton of NOAA and the Final Recovery Plan for the Shortnosed Sturgeon (*Acipenser brevirostrum)* (1998).

Proposed Military Training Activities

- Combat Rubber Raiding Craft (CRRC) (Paddle and Motor driven).
- Helocast Operations. Insertion of CRRC from Helicopter by sling or from the cabin crew of cargo door into the river.
- Bucket Training; Helicopters submerge large buckets (780 gallon) into the Savannah River, drawing water through valves. Water buckets are used to extinguish wild-land fires.
- Self-contained Underwater Breathing Apparatus (SCUBA).

Army waterborne training activities will be limited to approximately 11 miles of the Savannah River near the SRS (U.S. Army / DOE JSOP).

Current Species Status

The shortnosed sturgeon (*Acipenser brevirostrum*) was listed as endangered on March 11, 1967 (32 FR 4001). Shortnosed sturgeon remained on the endangered species list with enactment of the ESA in 1973. Although originally listed as endangered range wide, the NMFS recognizes 19 distinct population segments. 4 Segments in South Carolina and 4 segments in Georgia have been found, mostly along the Savannah River (Final Recovery Plan / Shortnosed Sturgeon. Dec., 1998).

Habitat Requirements and Limiting Factors

Shortnosed sturgeons inhabit the main stems of their natal rivers, migrating between freshwater and Mesohaline River reaches. Spawning occurs in upper, freshwater areas, while feeding and overwintering activities may occur in both fresh and saline habitats. Habitat degradation or loss (resulting, for example, from dams, bridge construction, channel dredging, and pollutant discharges), and mortality (for example, from impingement on cooling water intake screens, dredging, and incidental capture in other fisheries) are principal threats to the species' survival (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Legislative Background

Shortnosed sturgeon were originally listed as an endangered species by the FWS on March 11, 1967 under the Endangered Species Preservation Act (32 FR 4001, Appendix I). The NMFS later assumed jurisdiction for Shortnosed sturgeon under a 1974 government reorganization plan (38 FR 41370). Although the original listing notice did not cite reasons for listing the species, a 1973 Resource Publication (Appendix II), issued by the U.S. Department of Interior, stated that shortnosed sturgeon were “in peril ... gone in most of the rivers of its former range [but] probably not as yet extinct" (USDOI 1973). Pollution and overfishing, including by catch in the shad fishery, were listed as principal reasons for the species' decline. In the late nineteenth and early twentieth century’s shortnosed sturgeon

commonly were taken in a commercial fishery for the closely related, and commercially valuable, Atlantic sturgeon (*Acipenser oxyrinchus*). Catch statistics did not differentiate the 2 species. Some mis-identifications occurred (Ross et al. 1988) because, at smaller sizes, Atlantic sturgeon are easily confused with shortnosed sturgeon unless diagnostic features are recognized. Because there are few confirmed historical reports of shortnosed sturgeon captures and because fishermen and scientists did not distinguish between the two species in scientific reports and landing records, there are no reliable estimates of historical population sizes. More than a century of extensive fishing for sturgeon contributed to the decline of Atlantic and shortnosed sturgeon populations along the east coast. Heavy industrial development during the twentieth century in rivers inhabited by sturgeon impaired water quality and impeded these species' recovery; possibly resulting in substantially reduced abundance of shortnose sturgeon populations within portions of the species' ranges (e.g., southernmost rivers of the species range: Satilla, St. Mary's, and St. Johns Rivers). Congress passed the ESA to provide protection for species threatened with extinction. Pursuant to Section 4(f) (1) of the ESA, the NMFS and the USFWS are required to develop and implement recovery plans "for the conservation and survival of endangered species and threatened species" unless a recovery plan would not help to promote species conservation. Highest priority is given to those species that are or may be in conflict with development projects or other commercial activities. Shortnosed sturgeon spends their entire life in waters that are heavily impacted by various construction and industrial activities (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

The Savannah River

The Savannah River is a heavily industrialized and channelized drainage that forms the South Carolina/Georgia border. The river is dammed, but not below the fall line. Shortnosed sturgeon were first documented in the system in the mid-1970s. During 1984-1992, over 600 adults were collected by shad fishermen and researchers using gillnets and trammel nets. The ratio of adults to juveniles in this study was very high, indicating that recruitment is low in this river. During 1984-1992, approximately 97,000 shortnosed sturgeon (19% tagged) of various sizes were stocked in the Savannah River to evaluate the potential for shortnosed sturgeon stock enhancement. Subsequent investigation showed that stocked fish were at large for an average of 416 days and comprised 41% of all juvenile sturgeon collected (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Bathymetry

Copies of Shortnosed sturgeon known spawning locations and habitat can be found in the attachments (Dr. Stephania Bolden, NOAA). See page 34 and 35.

Biological Characteristics

Habitat and Life History

Shortnosed sturgeon are found in rivers, estuaries, and the sea, but populations are confined mostly to natal rivers and estuaries. The species appears to be estuarine anadromous in the southern part of its range, but in some northern rivers it is "freshwater amphidromous", i.e., adults spawn in freshwater but regularly enter saltwater habitats during their life. Adults in southern rivers forage at the interface of fresh tidal water and saline estuaries and enter the upper reaches of rivers to spawn in early spring on the Savannah River; February through April. The use of saline habitat varies greatly among northern populations (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Early Life Stages

At hatching, shortnosed sturgeon are blackish-colored, 7-11 mm long, and resemble tadpoles. Hatchlings have a large yolk-sac, poorly developed eyes, mouth and fins, and are capable of only "swim-up and drift" swimming behavior. They are ill-equipped to survive as free-swimming fish in the open river.

In 9-12 days shortnosed sturgeon absorb the yolk-sac and develop into larvae at about 15 mm TL

Larvae have well-developed eyes, a mouth with teeth, and fins capable of normal swimming. In the wild, larvae of this size probably migrate downstream. Larvae collected in rivers were found in the deepest water, usually within the channel (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Juveniles

Juveniles (3-10 year olds) occur in at the saltwater/freshwater interface on the Savannah River. Juveniles move back and forth in the low salinity portion of the salt wedge during summer. Juveniles in the Savannah River use sand/mud substrate in 10-14 m depths. Warm summer temperatures (above 28°C) may severely limit available juvenile rearing habitat in some southern rivers (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Adults

Adult sturgeon occurring in freshwater or freshwater/tidal reaches of rivers in summer and winter often occupy only a few short reaches of the total river length. Summer concentration areas in southern rivers are cool, deep, thermal refugia, where adults and juveniles congregate (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Reproduction - Length and age at maturity

Length at maturity (45 - 55 cm FL) is similar throughout the shortnosed sturgeon's range, but because fish in southern rivers grow faster than those in northern rivers, southern fish mature at younger ages. Males spawn first at 2-3 years in Georgia, 3-5 years in South Carolina. Females first spawn at 6 years or less in the Savannah River. Most shortnosed sturgeon probably survives spawning, although there is some post-spawning mortality. Known spawning locations are north of proposed Army training locations on the Savannah River near SRS. There are no known spawning locations adjacent to SRS at this time (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Spawning Periodicity

Spawning periodicity is poorly understood, but males seem to spawn more frequently than females. At least some males and females in the Savannah River may spawn in consecutive years but most apparently do not (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Spawning behavior

The Shortnosed sturgeon spawning period is estimated to last from a few days to several weeks. Sturgeon in the Savannah River remained on the spawning grounds for 2-3 weeks. Males fertilize the female's eggs as the eggs are released close to the substrate (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Spawning Habitat

Information on the location and type of river reach used for spawning is available for many rivers. Channels are important for spawning in many rivers. Characteristic channel spawning habitats vary slightly among rivers; in curves with gravel/sand/log substrate in the Savannah River (Final Recovery Plan, Shortnosed December 1998).

Spawning timing and river conditions

Spawning begins in freshwater from late winter/early spring (southern rivers). Spawning usually ceases when water temperatures reach 12-15°C. However, shortnosed sturgeon may spawn at higher

temperatures. For example, spawning occurs in early-February to April in the Savannah River (Figures page 34 and 35) (Final Recovery Plan, December 1998).

Survival and Recruitment

There is no information on survival of eggs or early life stages in the wild. Year class strength of shortnosed sturgeon populations is probably established early in life, perhaps in the initial few weeks. Although there is no commercial fishery for shortnosed sturgeon, some fisheries incidentally catch adult sturgeon and poaching impacts all populations to an unknown degree. Incidental capture of shortnosed sturgeon also occurs in gill net fisheries in the southern portion of the shortnosed sturgeon's range. Gill net fisheries for American shad and trawl fisheries for shrimp in Georgia and South Carolina captured about 2% of a tagged sample of shortnosed sturgeon. The gill net fishery was responsible for 83% of the total shortnosed sturgeon captures. In addition, recent apprehension of poachers operating in South Carolina indicates that illegal directed take of shortnosed sturgeon in southern rivers may be a significant source of mortality (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Migration and Movements

Movement patterns in shortnosed sturgeon vary with fish size and home river location. Juvenile shortnosed sturgeon generally move upstream in spring and summer and move back downstream in fall and winter; however, these movements usually occur in the region above the saltwater/freshwater interface. Adult shortnosed sturgeon exhibit freshwater amphidromy in some rivers in the northern part of their range but are generally estuarine anadromous in southern rivers. While this species is occasionally collected near the mouths of rivers, shortnosed sturgeon are not known to participate in coastal migrations. Spawning migrations are apparently triggered when water temperatures warm above 8°C. Consequently, spring spawning migrations occur earlier in southern systems. A shortnosed sturgeon spawning migration is characterized by rapid, directed and often extensive upstream movement. Adults tracked adults during pre-spawning upstream migrations of up to 200 km in the Savannah River. Spawning migrations are easily interrupted by capture and handling or by dams. Non-spawning movements include rapid, directed post-spawning movements to downstream feeding areas in spring and localized, wandering movements in summer and winter. Shortnosed sturgeon usually leave the spawning grounds soon after spawning. Post-spawning migrations were correlated with increasing spring water temperature and river discharge. During these movements shortnosed sturgeon apparently move singly and "home" to very specific sites. Estimated swimming speed during summer is considerably slower than during spawning migrations while shortnosed sturgeon are even less active in winter (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Feeding

Shortnosed sturgeon are benthic omnivores but have also been observed feeding off plant surfaces. Based on the high incidence of non-food items in juvenile shortnosed sturgeon, it has been concluded that juveniles randomly vacuum the bottom while adults are more selective feeders. The presence of food in the gut during all times of day indicated that shortnosed sturgeon are continuous feeders. Shortnosed sturgeon feed on crustaceans, insect larvae, worms, and mollusks; however, they apparently undergo ontogenetic shifts in preferred foods. Insect larvae predominate in the diet of juveniles while adults feed primarily on small mollusks. In southern rivers have been described at the saltwater/freshwater interface during fall and winter in the Savannah River. During summer, shortnosed sturgeon in southern systems appear to reduce activity, fast, and lose weight (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Factors Affecting Recovery

The USFWS identified pollution and overharvesting in commercial fisheries as reasons for initially listing shortnosed sturgeon as endangered under listing criteria set forth in the Endangered Species Conservation Act of 1969 (USDOI 1973). Many aspects of shortnosed sturgeon biology and environmental tolerances are poorly understood, presumably because the sturgeon's endangered status limits access to study animals. As a result, there is much speculation about the factors that affect recovery of shortnosed sturgeon populations yet not much conclusive evidence. However, as discussed below, we can identify various activities that, left unchecked, may contribute to the further decline and impede recovery of Shortnosed sturgeon. Through Section 7 consultations, mandated by the ESA, federal agencies are required to assess the impact(s) of federal projects on shortnosed sturgeon. Projects that may adversely affect sturgeon include dredging, pollutant or thermal discharges, bridge construction/removal, dam construction, removal and relicensing, and power plant construction and operation. As a result of Section 7 consultations, the NMFS has obtained some valuable information regarding the extent to which these projects may affect shortnosed sturgeon. In many cases, however, data are inconclusive in establishing any direct relationships between project activities and biological impacts to sturgeon populations. The following is a summary of the best available information regarding influences on sturgeon recovery throughout the species' range (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Commercial and Recreational Fishing

Directed harvest of shortnosed sturgeon is prohibited by the ESA. Sturgeon may be most prone to capture during their spring spawning migration which coincides with the shad fishing season. In fall and winter, sturgeon congregate in deep depressions of river where there is little commercial fishing activity, although poaching probably occurs all year (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Poaching

While the impacts of poaching to individual population segments is unknown, this threat may be significant in some rivers (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Bridge Construction/Demolition

Bridge construction and demolition projects may interfere with normal shortnosed sturgeon migratory movements and disturb sturgeon concentration areas. Bridge demolition projects may include plans for blasting piers with powerful explosives. Unless appropriate precautions are made to mitigate the potentially harmful effects of shock wave transmission to the air-bladder connected to the gut; fish like shortnose sturgeon may suffer internal damage and/or death may result. There are no data available on the effects of blasting on sturgeon (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Contaminants

Contaminants, including toxic metals, polychlorinated aromatic hydrocarbons (PAHs), pesticides, and polychlorinated biphenyls (PCBs) can have substantial deleterious effects on aquatic life including production of acute lesions, growth retardation, and reproductive impairment. Ultimately, toxins introduced to the water column become associated with the benthos and can be particularly harmful to benthic organisms like sturgeon. Although there have not been any studies to assess the impact of contaminants on shortnosed sturgeon, elevated levels of environmental contaminants, including chlorinated hydrocarbons, in several other fish species are associated with reproductive impairment (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Dams

Hydroelectric dams may affect shortnosed sturgeon by restricting habitat, altering river flows or temperatures necessary for successful spawning and/or migration, and causing mortalities to fish that become entrained in turbines. In all of these rivers, shortnosed sturgeon spawning sites occur just below the dams, leaving all life stages vulnerable to perturbations of natural river conditions caused by the dam's operation. Sturgeon appear unable to use some fish ways (e.g., ladders) but have been lifted in fish lifts. An inability to move above dams and use potentially beneficial habitats may restrict population growth. Since sturgeon require adequate river flows and water temperatures for spawning, any alterations that dam operations pose on a river's natural flow pattern, including increased or reduced discharges, can be detrimental to sturgeon reproductive success. Similarly, low elevation dams in the Southeast may also restrict or limit sturgeon access to natural spawning areas. In the Savannah River shortnosed sturgeon are known to spawn downstream of the Augusta City lock and dam. A low elevation Lock apparently block upstream migration of that river's shortnosed sturgeon population (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

Dissolved Oxygen

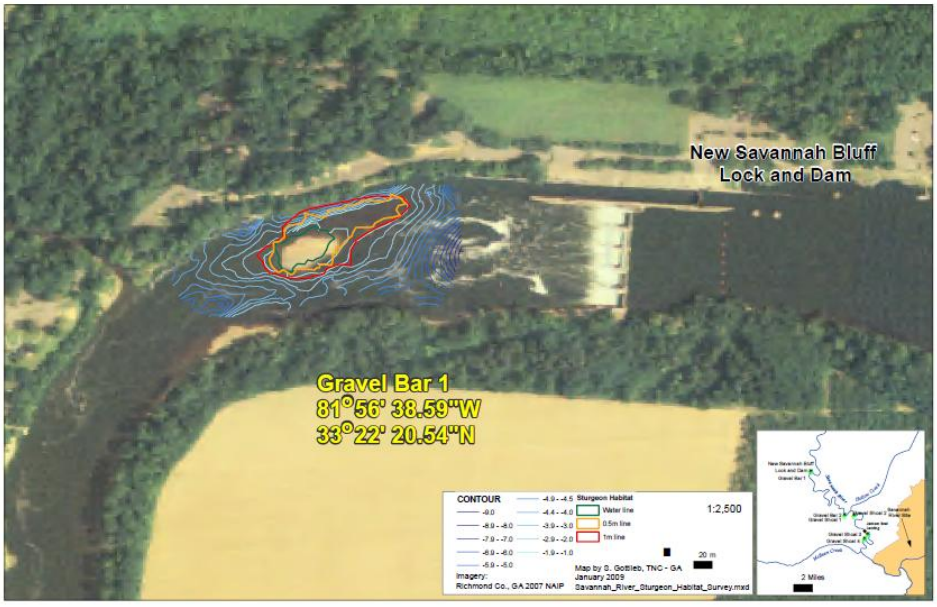
Pulp mill, silvicultural, agricultural, and sewer discharges, which contain elevated temperatures or high biological demand, can reduce dissolved oxygen levels. In addition, reduced water flows resulting from power plant shut downs can produce anoxic conditions downstream. These may occur at Cooling Water Intakes. Low oxygen levels are known to be stressful to aquatic life, and presumably, sturgeon would be adversely affected by levels below this limit. Shortnosed sturgeon may be less tolerant of low dissolved oxygen levels in high ambient water temperatures and show signs of stress in water temperatures higher than 28oC. At these temperatures, concomitant low levels of dissolved oxygen may be lethal. In Georgia, several rivers exhibit low oxygen levels at the saltwater/freshwater interface, an area that normally aggregates both juveniles and adults (Final Recovery Plan, Shortnosed Sturgeon Dec., 1998).

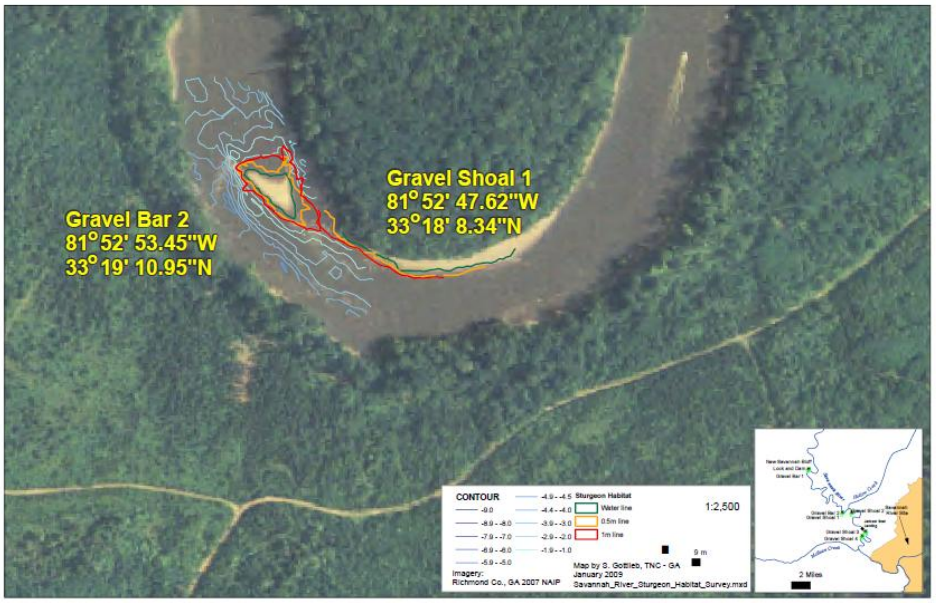
Military Training Restriction on the Savannah River

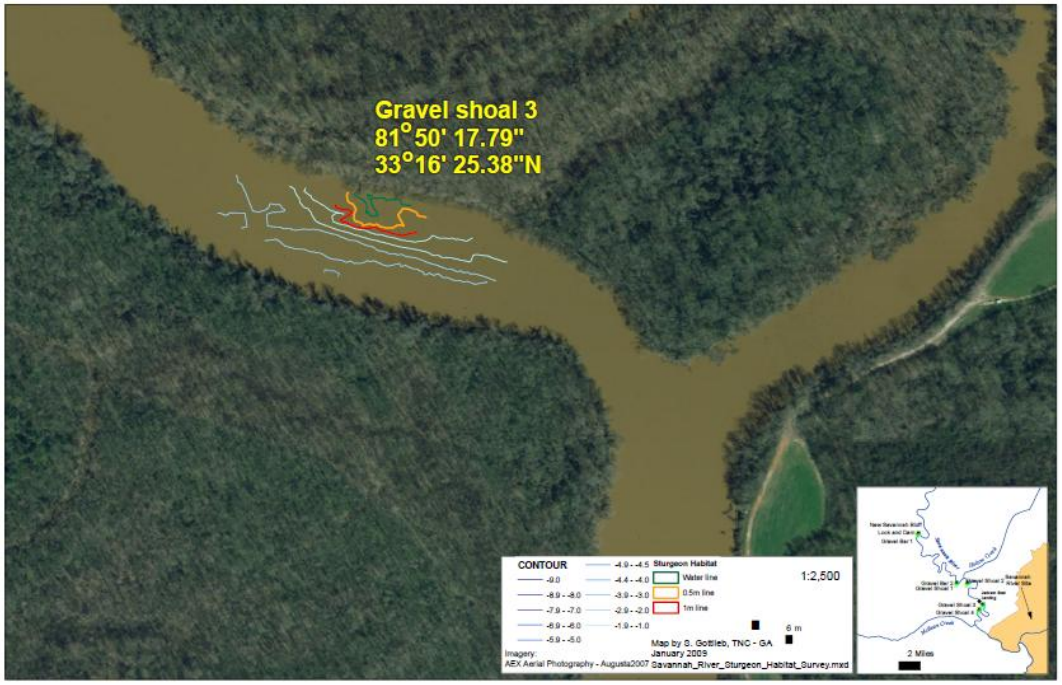
Army training activities are restricted from the Savannah River during spawning season, February through April. Underwater training is authorized; however, underwater pyrotechnics that detonate underwater to simulate combat activities are prohibited subsurface. Blank weapons fire and pyrotechnics are authorized on the surface of the water. Every effort will be made to contain expended ammunition residue such as brass, links, and other particulate matter inside boats and aircraft. Training units will not release chemicals into the environment, such as fuel, oil, human waste, or cleaning solvents. Trash will be collected and disposed of properly (U.S. Army / DOE JSOP).

Shortnosed Sturgeon Training and Education for Army Training activities on SRS

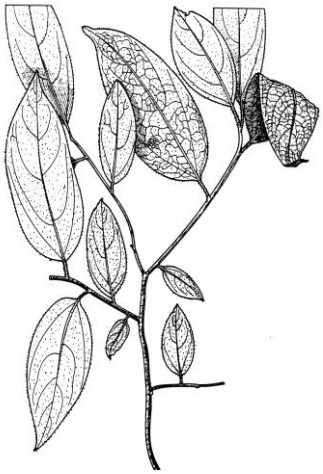
All soldiers participating in training on the Savannah River will be instructed on presence of the Shortnosed Sturgeon as a TES in the Savannah River, provided photographs for visual identification, issued precautions, and training limitations explained for waterborne training activities on the river. A brochure will be developed for all TES found on SRS. This brochure will be issued to all soldiers prior to commencement of any training activities (U.S. Army / DOE JSOP).

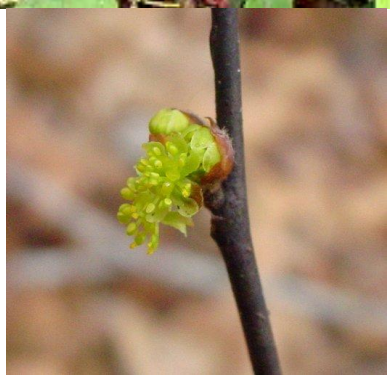

New Savannah Bluff
Lock and Dam
Gravel Bar 1
81°56' 38.59"W
33°22' 20.54"N
CONTOUR
Sturgeon Habitat
Water line
0.5m line
1m line
1:2,500
20 m
Map by S. Gottlieb, TNC - GA
January 2009
Savannah_River_Sturgeon_Habitat_Survey.mxd
Imagery:
Richmond Co., GA 2007 NAIP
2 Miles


Gravel Shoal 1
81°52' 47.62"W
33°18' 8.34"N
Gravel Bar 2
81°52' 53.45"W
33°19' 10.95"N
CONTOUR
Sturgeon Habitat
Water line
0.5m line
1m line
1:2,500
Map by S. Gottlieb, TNC - GA
January 2009
Savannah_River_Sturgeon_Habitat_Survey.mxd
Imagery:
Richmond Co., GA 2007 NAIP
2 Miles


Gravel shoal 3
81°50' 17.79"
33°16' 25.38"N
CONTOUR
-9.0
-8.9 - -8.0
-7.9 - -7.0
-6.9 - -6.0
-5.9 - -5.0
-4.9 - -4.5
-4.4 - -4.0
-3.9 - -3.0
-2.9 - -2.0
-1.9 - -1.0
Sturgeon Habitat
Water line
0.5m line
1m line
1:2,500
0 6 m
Imagery:
AEX Aerial Photography - Augusta2007
Map by S. Gottlieb, TNC - GA
January 2009
Savannah_River_Sturgeon_Habitat_Survey.mxd
2 Miles

Pondberry (Southern Spicebush) (*Lindera melissifolia*)





Pondberry on SRS

A single pondberry population is found within the Supplemental RCW Management Area. Mechanical midstory removal and prescribed fire would reduce competition around the population and provide additional benefits through increased plant vigor (B.E. RCW Management Plan, Ray 2009).

Pondberry is typically associated with wetland habitats. Pondberry was recently discovered at a Carolina bay on SRS. On SRS, this species is monitored and actions to protect it are being implemented. Populations of other sensitive plant species are being identified through field surveys. (DOE NRMP, May 2005) Pondberry is an aromatic, deciduous shrub with erect stems and shoots, growing as high as 6.5 ft (2 m). It spreads vegetatively by above ground shoots (stolons). Young stems and leaves are hairy. Leaves are alternate, drooping, and oblong, with hairy edges, a pointed tip and rounded base, 2-4 inches (5-10 cm) long and 0.6-1.4 inches (1.5-3.5 cm) wide. Small, pale, clustered flowers appear before leaves from February to April. Common spicebush *(Lindera benzoin)* is taller, 6.5-16.4 ft (2-5 m) with leaves that do not droop, are tapered at the base, and smell like benzene when crushed. Pond spice (*Litsea aestivalis)* is taller with shorter, leathery leaves. Pondberry is characterized by the sassafras-like odor of its crushed leaves and tendency to form thickets of clonal, unbranched stems (100-10,000) (Recovery Plan, Sept., 1993).

Life History

Flowers appear from February through April before leaf and shoot growth begins in late April. Fruiting occurs from August to September. The fruit matures in late autumn and is fleshy, oval, bright red, about 0.25-0.50 inch (6-10 mm) in diameter, but appears to have no reproductive value. Flowers are unisex and plants are mostly dioecious (Pondberry Recovery Plan, Sept., 1993).

Habitat

Bottomland hardwood forests in inland areas, poorly drained swampy depressions, and edges of limestone sinks and ponds closer to the coast. Occurs at the edges of swamps and ponds and depressions in forests of longleaf pine and pond pine forests. Typically found in somewhat shaded areas, but can also grow in full sun (Pondberry Recovery Plan, Sept., 1993).

Threats

Endangered by degradation and destruction of plants and habitat by land clearing and drainage operations, timber harvesting and other forest management practices that eliminate forest canopy and change hydrology of the soil, encroachment by competitor species, and fungal disease that causes the plant to wilt (Pondberry Recovery Plan, Sept., 1993).

Actions to protect the Pondberry by the Army

The Army may in train adjacent to wetlands, which are prime habitats of Pondberry. (U.S. Army / DOE JSOP) (Draft EA, 2010) Most rare plant locations on SRS are marked using yellow chain that surrounds the rare plant plots. These locations will be identified to all soldiers during the SRS Site Orientation Briefing. Photos of a Pondberry plant, which will also be shown to soldiers during the briefing. A brochure will be issued to all soldiers that identify all federally endangered species on SRS, and which specifically identify Pondberry locations. Foot traffic will not come within 50 meters of marked Pondberry locations. Wheeled vehicles may travel on existing roads that traverse through Pondberry habitat.

Because there is a single Pondberry population, FGRC can easily plan training activities away from these protected locations. FGRC will conduct daily inspections of Pondberry habitat should training activities inadvertently come within 100 meters of a protected Pondberry location. FGRC will verify through USFS-SR, that specific locations have not been affected by either Army or other SRS tenant organizations. At least 3 days prior to any training activity, FGRC will inspect Pondberry locations for existing habitat damage if the training activity is in the same timber compartment of a known Pondberry population (U.S. Army / DOE JSOP).

Ruts and other disturbance of top soil caused by military vehicles will be repaired to reduce the possibility of drainage and erosion. This should reduce the potential of drainage into wetlands that may contain an undocumented Pondberry population (U.S. Army / DOE JSOP).

Smooth Purple Coneflower (*Echinacea laevigata*)

The Smooth Purple Coneflower on SRS

The USFWS designated smooth purple coneflower as endangered in 1992 and provided a recovery plan in 1995. The smooth purple coneflower is a short-lived, rhizomatous perennial that can flower in its first season following germination if optimum growth conditions exist. Seeds germinate during the early spring and rapidly grow to maturity. Growth and survival of seedlings is primarily dependent upon soil moisture conditions and root competition. With continued survival and growth, new shoots along a common perennial rhizome arise through hormonal stimulation at lateral bud points. Factors that stimulate growth along the perennial rhizome are not known for the smooth purple coneflower.

In some plants, direct light, mechanical damage, increased nitrogen levels, and raised temperature conditions can stimulate rhizomatous shoot growth. Like most disturbance-mediated species, smooth purple coneflower flowering effort is greater in well-lit areas. Flowering begins in late May to mid June and seeds are mature by early to late October. Seeds are eaten by a wide variety of granivorous bird and small mammal species associated with temperate meadows and woodlands. Caching or mishandling by granivores represents a small percentage of the seed dispersal. Most seed not eaten are gravitationally dispersed away from the flower stalk. Like most perennial members of the Asteraceae, seed may persist for several years in the seed bank. Smooth purple coneflower individuals persist under heavily shaded conditions as persistent rhizomes. Disturbance related silvicultural practices increase flowering effort and overall vigor. Forest thinning and litter removal may stimulate growth after long periods of persistence under less than optimum conditions. Three populations of smooth purple coneflower are known to occur at SRS and a fourth population is now considered extirpated (B.E. for RCW, Ray 2009).

This plant is 1.5-3.5ft (50-100cm) tall and arises from a thick fleshy root. The basal leaves are much longer than wide, coarsely toothed, smooth above and beneath, 3-5in (8-13cm) long, 1-3in (3-8cm) wide, and are attached by long slender petioles. The stem leaves are alternate, similar in shape to the basal leaves but smaller, and with shorter petioles. The single flower head is terminal and has 2 kinds of small flowers, ray and disk. The 1 petal of each ray flower is deep to pale pink, toothed at the tip, 2-3in (5-8cm) long, and drooping. The disk flowers are purple and about 0.3in (1cm) long. The fruit is an achene (nutlet). Pollinators are speculated to be butterflies and bees. Seed dispersal is accomplished through seed-eating birds and small mammals (USACE- Construction Engineering Laboratory).

Threats

Its plight has diverse causes. Most populations have been affected by habitat loss due to agriculture or development. Mowing of highway rights-of-way threatens populations unless they are protected. Fire suppression has allowed encroachment of competing plants, which the smooth coneflower cannot tolerate (USACE- Construction Engineering Laboratory).

Actions to protect the Smooth Purple Coneflower by the Army

The smooth purple coneflower will be briefed as a federally protected plant and a photo shown to all soldiers during the Unit Orientation Briefing. Most rare plant locations are marked using yellow chain, which surrounds the plot. Foot traffic will not come within 100 meters of known smooth purple coneflower locations. A known Smooth Purple Coneflower population lies between Sandbox Road and Road 9. Sandbox Road will be restricted to travel by Army Convoys (U.S. Army / DOE JSOP). Absolutely no training of any type will be allowed on smooth purple coneflower growth. Because there are only a few coneflower locations, FGRC will plan training ground activities well away from these protected locations. On a daily basis, FGRC will spot check coneflower habitat should training activities inadvertently come within 100 meters of their location. FGRC will verify through USFS-SR, that specific locations have not been affected by either Army. At least 3 days prior to any training activity, FGRC will inspect coneflower locations for damage if the training activity is in the same timber compartment of known coneflower (U.S. Army / DOE JSOP).

American Alligator (*Alligator mississippiensis*)



Description and Habitat

American alligators *(Alligator mississippiensis)* inhabit the southeastern United States. Once a federally listed endangered species, American alligators have recovered in many areas. The species is still federally listed as threatened because it looks like the endangered American crocodile, and the ranges of the 2 species overlap. (Department of the Interior, Fish and Wildlife Service 50 CFR Part 17, The species belongs to the order Crocodylia and the family Alligatoridae. Alligators live in swampy areas, rivers, streams, lakes and ponds. On the Savannah River Site, alligators inhabit the Savannah River, its swamp and tributaries, Par Pond, L-Lake and other reservoirs on the site (SREL, Herp. Prog., Brochure. Alligators).

The American alligator is the largest reptile in North America. It has a large, dark (usually black), slightly rounded body and thick limbs. Unlike the crocodile, the alligator has a broad head. The alligator uses its powerful tail to propel itself through water. The tail accounts for half the alligator's length. While alligators move very quickly in water, they are generally slow-moving on land. They can, however, move quickly for short distances (Fact Sheet, Smithsonian National Zoological Park).

Legal Status/Protection

First listed as an endangered species in 1967, the American alligator was removed from the endangered species list in 1987 when the Fish and Wildlife Service pronounced the American alligator fully recovered. They are classified as a threatened species under the ESA because of their similarity in appearance to the American crocodile, an endangered species. (Department of the Interior, Fish and Wildlife Service 50 CFR Part 17, South Florida is the only place in which the crocodile and the alligator occur together. American crocodiles are found only at the tip of southern Florida (Recovery Plan for South Florida).

Behavior and Habitat

Alligators live in freshwater environments, such as ponds, marshes, wetlands, rivers, and swamps, as well as brackish environments. Large male alligators are solitary, territorial animals. The largest males and females will defend prime territory. Smaller alligators can often be found in large numbers in close proximity to each other, because smaller alligators have a higher tolerance of other alligators within a similar size class. During breeding season, the female builds a nest of vegetation, sticks, leaves, and mud in a sheltered spot in or near the water (American Alligator Fact Sheet, Defenders of the Wildlife, Fact Sheet).

Mating Season Mid-April through May

Gestation 60-65 day egg incubation

Clutch size 35 – 50 eggs. Some females lay up to 90 eggs. Eggs generally hatch in mid-August. Sex is fully determined at the time of hatching and irreversible thereafter, and depends on the temperature of

egg incubation, temperatures of 86°F producing females, of 93°F yielding only males (Fact Sheet, Smithsonian National Zoological Park).

Alligator Research at SREL

The University of Georgia's Savannah River Ecology Laboratory (SREL) began conducting ecological studies on the newly created Savannah River Site (SRS) on the upper Coastal Plain of South Carolina in 1951. Studies of the American alligator on the SRS have increased our knowledge about its basic ecology and provided insights on the effects of industrial facilities on alligators. SREL's ongoing research, in collaboration with researchers from around the world, continues to lead to new discoveries about alligators and other crocodilians (SREL, Herp. Prog., Brochure. Alligators).

Threats

Once hunted for their hides, alligators today are threatened mainly by habitat loss and encounters with people. They are hunted for their skin (for leather goods) and for their meat. Before hunting was controlled in 1970, an estimated 10 million alligators were killed for their skins. As sea level rises due to climate change, a significant portion of alligators' freshwater and brackish marsh habitat may face an incursion or inundation of saltwater. Like many reptiles, the sex of baby alligators is determined by the temperature at which the eggs incubate; higher temperatures due to climate change will produce a higher ratio of males, altering the male-female sex ratios (American Alligator Fact Sheet).

Actions to protect the Alligator by the Army

The alligator's primary habitat is wetlands, river areas, swamps, and lake. All military units training on SRS are strictly forbidden from molesting or disturbing any alligators. The Army will conduct limited training on SRS lakes and the Savannah River. All training will be approved through the 90 /60 / and 30 day approval process. The Army may train adjacent to wetlands on SRS but will not enter wetlands which may provide pools, small ponds, and Carolina bays for Alligators to live. Army waterborne operations are limited to approximately 11 miles of the Savannah River and shores near D-Area. This area includes D- Area, and 681-1G Pump House, otherwise known as 1G Pump House. Large Alligators are known to sun themselves directly below the dam and retaining wall near 1G Pump House. Military personnel are allowed to train on 1G Pump House as long as Alligators are not harassed. Tactical training as previously discussed, should not directly impact Alligator habitat due to the limited waterborne training locations. Soldiers will be made aware of Alligator presence in and near the Savannah River during the Unit Orientation Unit briefing prior to the commencement of any training activity (U.S. Army / DOE JSOP).

Bald Eagle (*Haliaeetus leucocephalus*)

Bald Eagle TMZ

Protective Legislation

Three federal laws provide protection for the bald eagle; the Endangered Species Act, the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act of 1918. The U.S. Fish and Wildlife Service Pacific Bald Eagle Recovery Plan (1986) includes recommendations for managing habitat and human disturbance. The U.S. Fish and Wildlife Service (USFWS) approved management plan for the bald eagle provides protection of the immediate area surrounding each nesting territory.

The bald eagle *(Haliaeetus leucocephalus)*, our national bird, is the only eagle unique to North America. The bald eagle's scientific name signifies a sea *(halo)* eagle *(aeetos)* with a white *(leukos)* head. The bald eagle is a sea or fish eagle. The "southern" bald eagle, *Haliaeetus leucocephalus s,* is found in the Gulf States from Texas and Baja California across to South Carolina and Florida, south of 40 degrees north latitude.

Bald eagles were officially declared an endangered species in 1967 in all areas of the United States south of the 40th parallel, under a law that preceded the Endangered Species Act of 1973.

Until 1995, the bald eagle had been listed as endangered under the Endangered Species Act in 43 of the 48 lower states.

In July of 1995, the US Fish and Wildlife Service upgraded the status of bald eagles in the lower 48 states to "threatened."

On June 28, 2007 the Interior Department took the American bald eagle off the Endangered Species List. The bald eagle will still be protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

The Bald Eagle Protection Act prohibits the take, transport, sale, barter, trade, import and export, and possession of eagles, making it illegal for anyone to collect eagles and eagle parts, nests, or eggs without a permit.

Under the Migratory Bird Treaty Act, it is illegal to pursue, hunt, take, capture, kill, possess, sell, barter, purchase, export, or import migratory birds, their parts, nests or eggs, except as permitted by regulation. “Take” is defined under the Migratory Bird Treaty Act as “pursue, hunt, shoot, wound, kill, trap, capture, possess, or collect.”

On SRS, a recent reduction in nest productivity coincided with an incidence of avian vacuolar myelinopathy (AVM). AVM is a debilitating and often fatal disease found in American coots and other

water birds that are primary prey species of bald eagles at SRS. AVM has been confirmed in the death of two eagles at SRS, and is suspected to have killed more (DOE, NRMP, May 2005).

Bald Eagle Description

Distinguished by a white head and white tail feathers, bald eagles are powerful, brown birds that may weigh 14 pounds and have a wingspan of 8 feet. Male eagles are smaller, weighing as much as 10 pounds and have a wingspan of 6 feet. Sometimes confused with golden eagles, bald eagles are mostly dark brown until they are four to five years old and acquire their characteristic coloring. There is a distinction between the two species, though, even during the early years. Only t he tops of the bald eagle's legs have feathers. The legs of golden eagles are feathered all the way down (USFWS Bald Eagle Fact Sheet, Rev. 2007).

Bald Eagle Habitat

The Bald eagle is one such bird that is quite affected by human activities. This large and magnificent bird prefers habitat close to seacoast or even other water bodies such as lakes. (USFWS Bald Eagle Fact Sheet, Rev. 2007) One of the Bald Eagle nest is located adjacent to L-Lake. The Bald eagle love to be in areas that have an abundance of fish. It is also generally spotted in areas that are free from human interference (SRS Ecological - Military Planning Map).

The Bald eagle is often seen in areas of North America. It prefers deciduous forest. This bird selects hardwood trees for roosting and nesting. During the breeding season, the Bald eagle shifts its location towards south from the northern areas of Canada or Alaska. This is in search of fish for food and this move usually occurs by late October (USFWS Bald Eagle Fact Sheet, Rev. 2007).

The Bald eagle particular chooses its habitat in relation to the nests it wishes to build. These birds build large nests, which have a depth of about 2 feet and a width of about 5 feet. It lines the nests with a variety of things such as twigs, grass, moss etc., (USFWS Bald Eagle Fact Sheet, Rev. 2007).

Threats

The main threat to Bald Eagles was the pesticide DDT. This widely used pesticide was slow to decay and moved up the food chain, becoming more and more dangerous to many birds as it became more concentrated. As Bald Eagles consumed contaminated fish, their egg shells were weakened, eventually decreasing populations to a dangerously low level. Another way Bald Eagles and other eagles die is by electrocution. Main places eagles travel to are electric power plants. Sometimes they get too close to the power lines and get shocked. (The dams at the power plants keep the river waters open, and the eagles go there to fish.) A third way eagles die is by poachers (USFWS Bald Eagle Fact Sheet, Rev. 2007).

Proposed actions to protect the Bald Eagle by the Army

There are two Bald Eagles in the Territorial Management Zones (TMZ) on SRS. One TMZ is in the restricted area and therefore does not impact Army training. The USFS-SR has imposed a 2,000 meter, or roughly 6561.68 foot buffer around each TMZ. There is a no access restriction on the Bald Eagle TMZ from Oct., 1st through May 31st (SRS Ecological - Military Planning Map).

The Army will restrict all training activities inside the Bald Eagle TMZ other than convoy activity on Road B. Road B is an access road which travels through SRS, allowing employees access to various work facilities. Military vehicles may travel by vehicle convoy Road B, or by foot on the sides of Road B to access authorized training lands. Foot traffic is authorized to transit through the Eagle TMZ to other training areas located outside the Eagle TMZ.

Military aircraft should avoid flying over the Eagle TMZ. Specific air corridors have been implemented to allow military aircraft access to SRS and away from Eagle TMZ areas. If military aircraft must fly over an Eagle TMZ, aircraft must maintain a minimum altitude of 1000 feet above eagle TMZ areas.

A brochure will be issued to all soldiers which identify all endangered species on SRS, and specifically identify known Eagle TMZ locations. All soldiers will be shown photographs and receive a briefing on the bald eagle during the unit orientation briefing prior to commencement of any training activities (U.S. Army / DOE JSOP).

The Wood Stork *(Mycteria Aamericana)* on SRS

Adult Wood Storks with young in the nest (Birdsville–GA DNR).

The wood stork is 1 of 19 species in the family Ciconiidae and 1 of 4 species in the genus *Mycteria*. Wood storks are morphologically indistinguishable across the species' range and no subspecies have been proposed. Wood storks are the only stork species and the largest wading bird that breeds in the United States. They are large, long-legged birds with a head to tail length of 85 to 115 cm (33 to 45 inches) and a wingspan of 150 to 165 cm (59 to 65 inches). Adults are white except for their primary and secondary wing and tail feathers, which are black with a greenish sheen. Adults have an unfeathered head and neck with a long, thick black bill. The legs and feet are dark; toes are pink during the breeding season. Sub-adults are similar except the head and neck have grayish feathers that are gradually lost as the bird matures. Sub-adults also have a pale yellow bill.

Wood storks were listed as endangered on February 28, 1984, pursuant to the Endangered Species Act of 1973, as amended (U.S. Fish and Wildlife Service 1984). They are also listed as endangered under the South Carolina Nongame and Endangered Species Conservation Act. The South Carolina Heritage Trust Program lists the wood stork as threatened in this state.

The United States breeding population of wood storks was listed as endangered after nesting pairs declined from between 15,000 and 20,000 in the 1930's to 2,500 pairs by 1978. The low number in 1978 was a combination of a decrease in the regional population and poor conditions for nesting that particular year (U.S. Fish and Wildlife Service 1996). Historically, wood storks have used South Carolina as a post-nesting foraging area during the summer and fall. In 1981, the first successful wood stork nests were documented in South Carolina (11 nests). By 2004, the population had grown to 2,057 nests at 14 sites (Wood Stork Taxonomy and Basic Description, Murphy).

Wood Storks nesting in Georgia, Florida, and South Carolina move south for the winter. Wood storks have been seen in South Carolina every month of the year. However, Storks nesting from central Florida to South Carolina usually start in late winter (February-March) and finish in July-August. Wood storks use a variety of freshwater and estuarine wetlands for nesting, feeding, and roosting sites. Each habitat type has distinct characteristics.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

Currently, Wood storks have not been found nesting on SRS. However, Wood Storks have been known to forage on SRS swamps. (DOE, NRMP, May 2005) Wood storks typically nest in the upper branches of black gum (*Nyssa biflora*) or bald cypress (*Taxodium distichum*) trees over standing water. Standing water deters mammalian predators and is an essential element of colony sites. Storks require open access to nest trees and are frequently found in trees adjacent to open water areas. Range-wide, there has been a trend towards the use of manmade wetlands as colony sites in recent years as these sites are not totally dependent on rainfall for water. In South Carolina, colony sites are surrounded by extensive wetlands, in particular palustrine forested wetlands. Typically, storks select patches of medium to tall trees as nesting sites, which are located either in standing water (swamps) or on islands surrounded by relatively broad expanses of open water. Development, lowered water tables and disturbance degrade nesting sites. Therefore, as their natural range has become depleted, South Carolina has become an important population source in recent years (Wood Stork Taxonomy and Basic Description, Murphy).

Foraging

Storks forage in a wide variety of shallow wetlands, whenever prey concentrations reach high enough densities, in water that is shallow and open enough for the birds to be successful in their hunting efforts. Good feeding conditions usually occur in relatively calm waters, where depths are between 5-40 cm (2-16 inches), and where the water column is uncluttered by dense patches of aquatic vegetation. Typical foraging sites throughout the species' range include freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments and depressions in cypress heads and swamp sloughs. Difference between seasons and years in rainfall and surface water patterns often cause storks to make changes between years in where and when certain habitats are used for nesting, feeding or roosting. (Recovery Plan, 1997) At the height of industrial activity at SRS, Steel Creek and Steel Creek Delta, Four Mile Branch, and Beaver Dam Creek were prime forage location for Wood Storks because reactor cooling water from various sites fed these creeks in order to maintain this vital foraging area. Once these reactors were brought off-line, water eventually dried up, thus valuable Wood Stork forage locations were reduced (Coulter, 1993).

Known Colonies and Foraging Sites

The Birdsville Colony was discovered in 1980, near Millen, Georgia. This location is an excellent breeding location. The storks first return to the area in late February or early March and begin arriving in the colony from early through late March. They lay eggs from late March through late May; after a 30-day incubation period the chicks hatch from late April through late June. The chicks remain in the colony for two to three months and begin dispersing from late June through early September, but in most years the birds have largely left the colony by late July or early August. The Birdsville Colony is within 45 km of the SRSS. Storks have been followed from the colony to the SRSS where they were observed foraging; lt was thought that the SRSS may be an important foraging area for storks from the colony, lt was necessary to understand the size of the colony and the amount of food needed by the colony, as well as the timing of this need. lt was also important to understand the importance of food limitation (and so the possible importance of the SRSS) in affecting the reproductive success of the colony.

When the DOE decided to restart L-Reactor on the Savannah River Site (SRS) in the 1980s, there was concern that when the reactor was restarted, cooling water flowing into the Steel Creek Delta would raise the water level and the area would become too deep for foraging storks. The potential loss of this area to storks was important because storks had been observed foraging in the Steel Creek Delta. The USDOE began consultation with the USFWS in April, 1984, and the USDOE subsequently agreed to develop and

maintain alternative foraging habitat to replace the potential Ioss. Among alternate sites considered, Kathwood Lake on the National Audubon Society's (NAS) Silver Bluff Plantation Sanctuary was chosen. This location is near Jackson, South Carolina. Storks had been observed feeding at the lake in previous years and Kathwood Lake is within 45 km (28 miles) of the Birdsville Colony, the same distance as the Savannah River Swamp System (SRSS) is from the colony. A technical working group was formed with representatives of USDOE, USFWS, E. I. DuPont de Nemours and Company (and later the Westinghouse Savannah River Company), the NAS and the SREL to make suggestions on the design of the ponds and to review their effectiveness. It was decided to alter the lake, and to develop 4 ponds in its place. SREL took responsibility for gathering necessary biological information for the development of the Kathwood ponds, Jackson, South Carolina., and for subsequent management of the ponds. In order to design and manage the alternate foraging ponds as effectively as possible, it was necessary to understand aspects of the biology of the storks, the characteristics of their foraging sites Meyers directed this program (Coulter, 1993).

Feeding Behavior

The specialized feeding behavior of the wood stork involves tactilocation, also called grope feeding. A feeding stork wades through the water with the beak immersed and partially open. Tactilocation allows storks to feed at night or utilize water that is turbid or densely vegetated. Forested riverine floodplain habitats are frequently used, but a variety of ponds, ditches and diked marsh impoundments are important habitats. Use of these habitats is enhanced by receding water. Storks also forage around low tide along many coastal tidal creeks (Recovery Plan, 1996).

Roosting

Although storks tend to roost at sites that are structurally similar to nesting sites, they also use a wider variety of sites for roosting than for nesting. Non-breeding storks, for example, may change roosting sites in response to changing feeding locations, and in the process, will roost in patches of trees that would be unacceptable for nesting; (i.e. stands of tress over dry ground). Roosts may be used for long periods of time, either seasonally or annually over many years, or may be used for only brief periods, depending on the availability of persistent foraging areas in surrounding wetlands. Roosting sites include cypress heads and swamps, pine or hardwood islands in marshes, mangrove islands, expansive willow thickets or dry marshes, or on the ground on levees (Recovery Plan, 1996).

Breeding

Breeding Wood storks are seasonally monogamous, probably forming a new pair bond every season. It is believed that once storks reach maturity they nest on a yearly basis. (Recovery Plan, 1996)Mating occurs after a period of a highly ritualized courtship displays at the nest site. Wood storks in Georgia and South Carolina lay eggs in March to late May, with fledgling occurring in July and August. The SRSS was used as a foraging area by storks breeding nearby as well as storks dispersing after the breeding season from nearby and more distant colonies. The Birdsville Colony near Millen, Jenkins County, GA, is the only colony from which storks were likely to visit the SRSS during the breeding season. We studied the breeding of storks at this colony to determine the timing of breeding, the amount of food demand of these birds and the importance of foraging in affecting reproductive success. By comparing the numbers of birds dispersing from this colony and the timing of dispersal, with the numbers of storks in the SRSS and later at the Kathwood ponds, we could develop an understanding of the influx of storks dispersing after the breeding season (Coulter, 1993).

Reason for Listing

Other than man intruding on nest locations, extreme weather and predation appear to be the leading cause in the decline of eggs and fledglings in breeding location.

Some of the factors for listing wood stork as an endangered species in 1984, contributed to the decline of the population. One reason is the loss of feeding habitat as the reduction in small fish due to loss of

wetland habitat (drainage) or changes in hydroperiods. Wetlands drainage and hydroperiod alterations are believed to have lowered the productivity and availability of fish for the wood stork, as well as other wading bird species. Another reason for the decline in wood stork population is water level manipulation by man. This causes a gradual drying a prey habitat resulting in nest abandonment. Additionally, as water levels drop, predation increases of wood stork nests primarily by raccoons. Extreme drying of wood stork habitat results in loss of vegetation, which results in the loss of roost and nest locations. Growing human population expands taking up species habitats and requires huge water supplies to cover their needs. Introduction of water controlling techniques has changed the cycle of wetlands and interfered with the species' feeding pattern. Thus, artificially managed hydrological regimes resulted in long droughts and rain periods, which have caused Wood Storks to experience a reproduction failure. It is believed that destruction of habitat that supplies the species with necessary food is one of the basic threats. These birds need a great deal of food to feed their progeny during the nesting season. It is estimated that a wood stork family needs over four hundred pounds of food during a breeding season. At the same time, the portion of wetlands in southern Florida has been decreased enormously in the last decade. Therefore, wetlands and other habitats should be protected from further destruction. Water management plans should be created taking into account the effects for the wood stork population. Producing a mosaic of sites characterized by a low and a high water level is also a necessary condition for maintaining the species. Conservation efforts should also include further investigation of habitats suitable for wood storks and factors favorable for the population growth (Recovery Plan, 1996).

Recovery Plan

The long-term survival and recovery of the wood stork population requires that the mosaic of nesting, foraging, and roosting habitats necessary to support storks throughout their range during varying climatological and seasonal conditions must be indentified and protected. (Recovery Plan, 1996) Though SRS does not currently have nests of wood stork on SRS, merely preserving wetland acreage does not necessarily preserve the processes necessary for the production of a strong prey base for wading birds. (Coulter, 1993)The Army supports the management of wetlands to maintain or recover the dynamic wetland processes that create and make available the abundance of required for nesting birds. Therefore, Army training activities on SRS are restricted from swamp and prime foraging areas. In addition, Army training activities are not allowed within 200 feet of wetlands, swamps, lakes, and streams. The Savannah River is exempt from this training restriction.

Conservation Accomplishments

Most importantly, standardized surveys of nesting effort have been completed for the southeastern United States. In addition, a regional wood stork working group has been organized to facilitate information exchange and to set research and management priorities. Regional management guidelines for wood stork nesting, feeding and roosting habitats have been developed. A wood stork recovery plan has been completed by the USFWS and an information brochure to inform landowners of conservation and management needs of storks has been completed as a joint production of the USFWS the SREL. A general information pamphlet for distribution to the public has also been completed by Clemson University, Department of Pesticide Regulation. Techniques for management of fresh water ponds to enhance stork use have been developed and implemented at the NAS's Silver Bluff Plantation Sanctuary in Jackson, South Carolina. Finally, artificial nesting platforms have been developed to enhance stork nesting at colony sites with limited vegetation for nest construction. This technique was developed by USFWS-Refuges Division (Wood Stork Taxonomy and Basic Description, Murphy).

U.S. Army Protective Actions for the Wood Stork on SRS

At SRS, the Army has no desire to train in wood stork habitat such as swamps, shallow ponds, and locations of standing water. Except for the Savannah River, the Army will may train adjacent to wetlands, lakes, large streams or swamps. For those aviation units flying over the swamp and lake areas of SRS, all pilots and crew members will be briefed on the possible presence of wood stork in the swamp areas. Military aircraft routes will be planned and diverted away from known wood stork nests or forage sites during 60 and 30 day planning period. The FGRC–TFC will coordinate with the USFS-SR before each training event to receive an update on wood stork on SRS. An additional 500 foot buffer will be placed

around each site to protect the wood stork. The FGRC-TFC will consult with the USFS-SR prior to any training activity to determine if wood storks are present on SRS. Training events will be modified accordingly to facilitate and protect known wood stork nest, roost, and feeding locations. Pilots will be advised to report known wood stork locations to the FGRC-TFC immediately. This information will be forwarded to the USFS-SR by the FGRC-TFC. Military water craft, scuba operations, and similar activities on the Savannah River may transit past the wood stork location in order to move to and from the training site. A brochure will be issued to all soldiers with photos of the wood stork. All soldiers will be shown photographs and receive a briefing on the wood stork during the unit orientation briefing prior to commencement of any training activities (U.S./ DOE Army JSOP) (EA).

Effects Determination

This section addresses the impacts of the proposed Army training activities on SRS. This evaluation is based on the best available scientific information concerning the status of the species as it relates directly with proposed Army training activities as well as the best available scientific information concerning the biology and ecology of the species in question.

The following determination definitions are taken from "Endangered Species Consultation Handbook" (USFWS 1998).

No effect - the appropriate conclusion when the action agency determines its proposed action will not affect listed species or critical habitat.

May affect, not likely to adversely affect - the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial.

Beneficial effects are contemporaneous positive effects without any adverse effects to the species.

Insignificant effects relate to the size of the impact and should never reach the scale where take occurs.

Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

May affect, likely to adversely affect - the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or it's interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). Based on the information contained, herein, the proposed action of Army training on the Savannah River Site will result in the following determinations to federally protected species.

Smooth purple coneflower

Smooth purple coneflower will be protected from ground disturbing training activities as specified in this BE. The Army encourages disturbance related silviculture activities such as thinning and prescribed burning that will promote growth. Therefore, Army training activities will have ***no effect*** due to ***insignificant and discountable effects***.

Pondberry

One single Pondberry population is located next to a Carolina Bay. The Army encourages mechanical midstory removal and prescribed fire which would reduce competition around the population and provide additional benefits through increased plant vigor. Not sure thinning activities should be recommended for wetland habitats. Pondberry will be protected from ground disturbing training activities as specified in this Biological Evaluation. Therefore, Army training activities will have ***no effect*** due to ***insignificant and discountable effects***.

Wood Stork

No habitat disturbance or manipulation of foraging or roosting areas for the Wood Stork will occur since the Wood Stork restricts itself to standing pools of water and shallow streams. Ground training activities will have no effect on Wood Stork habitat since training activities are restricted within 200 feet of wetlands. Aircraft corridors over the SRS Swamp are mainly over thick expanses of pine, not suited for

nest and roost locations. Therefore, implementation of Army training activities ***may affect but not likely adversely affect*** wood storks due to ***insignificant and discountable effects***.

RCW

Impacts to RCWs will be avoided and minimized through implementation of restrictions on training requirements that would most likely have an effect on RCW habitat, establishment of buffer zones around sensitive areas, education, and tailoring of training events in and around RCW colonies. The Army encourages habitat management activities such as thinning, midstory control, prescribed fire, and adherence to the recovery standards that will benefit RCWs. Therefore, based on proven Army RCW management guidelines, implementation of proposed Army training activities ***may affect but not likely adversely affect RCWs*** because of ***insignificant*** effects.

Shortnosed Sturgeon

Habitat degradation or loss (resulting, for example, from dams, bridge construction, channel dredging, and pollutant discharges), and mortality (for example, from impingement on cooling water intake screens, dredging, and incidental capture in other fisheries) are principal threats to the species' survival. Army training activities are of such low impact that there will be virtually no impact to the Sturgeon. Additionally, Army training activities are restricted from the Savannah for the entire Sturgeon spawning season. The Army estimates only one to two short, low-intensity, training events will occur each year. The Army encourages habitat management activities for the Shortnosed Sturgeon. Therefore, proposed Army training activities will have ***no effect*** due to ***insignificant effects***.

American Bald Eagle

In the past, habitat degradation, pesticides, and poaching have been the main threat to the Bald Eagle. Only one eagle nest lies within the 120,000 acres of training land. A large buffers zone and training restrictions will provide excellent protection to this single nest. Therefore, proposed Army training activities ***may affect, but not likely adversely affect*** Bald Eagles because of ***insignificant*** effects.

American Alligator

No habitat disturbance or incursion into locations where Alligators will occur due to Army training activities. Ground training activities will have no effect on Alligators since training activities are restricted within 200 feet of wetlands and lakes. Therefore, implementation of Army training activities will have ***no affect*** due to ***insignificant and discountable effects***.

CONCLUSION

Overall, based on the best scientific data, the implementation of Army training activities ***may affect but not likely adversely affect*** federally protected species at SRS. Specific, effective, and proven training restrictions, education, and species protection activities are the best management practices to protect TES on SRS. Extensive research and consultation was used to develop this B.E.

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Acronyms

AGL – Above Ground Level
AIA – Artillery Impact Area
BE – Biological Evaluation
BRAC – Base Realignment and Closure
CBR – Chemical Biological and Radiological
COE – Contemporary Operating Environment
CPs – Command Posts
CRRC – Combat Rubber Raiding Craft
D-Area – Location found on the Savannah River Site.
DAC – Department of the Army Civilians
DDT - Dichlorodiphenyltrichloroethane
DPTMS – Directorate of Plans, Training, Mobilization, and Security
DOE-SRS – Department of Energy – Savannah River Site
DZs – Drop Zones
EA – Environmental Assessment
ESA – Endangered Species Act
ESMC s – Endangered Species Management Components
FOB – Forward Operating Base
FARP – Forward Arming and Refueling Point
FGRC – Fort Gordon Range Control
FGRC – TFC – Fort Gordon Range Control Training Facility Coordinator
GDPR – Global Defense Posture Realignment
GIS – Global Information System
HESCO Barriers - The HESCO bastion is both a modern gabion used for flood control and military fortification and the name of the British company that developed it in the late 1980's. It is made of a collapsible wire mesh container and heavy duty fabric liner, and used as a temporary to semi-permanent dike or barrier against blast or small-arms. It is used on nearly every United States Military base in Iraq as well as on NATO bases in Afghanistan.
HLZ – Helicopter Landing Zones
IAG – Interagency Agreement
IED – Improvised Explosive Device
ITAM – Integrated Training Area Management
JSOP – Joint Standard Operating Procedure
L-Lake – Is a large manmade lake located on SRS
INRMP – Integrated Natural Resources Management Plan
MOU – Memorandum of Understanding
MOUT – Military Operations on Urban Terrain
NBC – Nuclear Biological and Chemical
NEPA – National Environmental Protection Act
NMFS – National Maritime Fisheries Service
NOAA – National Oceanic Atmospheric Agency
OPFOR – Opposing Forces
PAHs - Polychlorinated aromatic hydrocarbons
Par Pond – Is a large manmade lake located on Savannah River Site
PCBs - Polychlorinated biphenyls
PBGs - Potential Breeding Groups
RCW – Red Cockaded Woodpecker
RFP – Response Force Package
ROM – Refuel on the Move.
SAIA – Small Arms Impact Area
SCUBA – Self-contained Underwater Breathing Apparatus
SOCOM – Special Operation Command
SRNS – Savannah River Nuclear Solutions
SREL – Savannah River Ecology Laboratory
SRS – Savannah River Site

SRSS – Savannah River Site Swamp
TES – Threatened and Endangered Species
TMZ - Territorial Management Zones
TOC – Tactical Operations Center
UMCP – Unit Maintenance Collection Points
USAEC – United States Army Corps of Engineers
USFS-SR – United States Forest Service – Savannah River
USFWS – United States Fish and Wildlife Service
WMD – Weapon of Mass Destruction