Memorandum

To: Roger Boykin, Regional Fire Management Coordinator, R4
Bill Leenhouts, National BAER Coordinator

From: Howard Phillips, Project Leader, Pocosin Lakes NWR

Subject: Evan's Road Wildfire, Pocosin Lakes NWR

Enclosed is the Burned Area Rehabilitation Plan for proposed rehabilitation activities following the Evan's Road Wildfire that burned across 28,700 acres of the Pocosin Lakes NWR.

The Burned Area Rehabilitation Plan proposes to treat the burned area through aerial and ground application of herbicides to reduce the spread of invasive species including Phragmites, alligator weed, and Japanese stiltgrass into the site, provide for site preparation and planting of Atlantic white cedar and cypress trees, replace unsalvageable wood duck nest boxes and refuge signs. The refuge accepts that the rehabilitation for this site is a long term commitment and the attached plan is only one small part of the commitment needed to restore the damaged area.

In the Burned Area Rehabilitation Plan the refuge is requesting $325,122 for three years of rehabilitation funding following the wildfire to begin the restoration process including the application of herbicide, site prep burn, and native pine planting. The break down of the costs is listed in the Specification tables in the plan.

According to US Fish and Wildlife Service, and Department of Interior Policy, the Regional Director may approve Burned Area Rehabilitation Fund requests up to $500,000 after concurrence with Regional Fire Management Coordinator that the plan fits the technical definition for the use of rehabilitation funds:

> "Project leaders submit electronic copies of completed plans to the Regional Fire Management Coordinator (RFMC) and National Burned Area Emergency Response Coordinator (NBAERC) for concurrent and coordinated technical, fiscal and policy review. The RFMC presents the plan and RFMC/NBAERC approval recommendations to the Regional Director for approval. Following Regional Director approval, the NBAERC presents plans with estimated costs > $500,000 to the Chief, Fire Management Branch for final approval. Following plan approval, the NBAERC performs the necessary NFPORS data entry according to the approved plan. "

I am submitting this Rehabilitation Plan for your fiscal and policy review. I have obtained concurrence of the biological opinion from the Raleigh Ecological Services Office that the actions proposed are "not likely to adversely affect" the endangered red wolf and endangered red-cockaded woodpecker and approval of the Southeast Region Integrated Pest Management Coordinator for appropriate use of the proposed herbicide applications.

August 21, 2008

Memorandum

To: Regional Fire Management Coordinator, R4

From: Regional Burned Area Emergency Response and Rehabilitation Coordinator, R4

Subject: Evans Road Fire Rehabilitation Plan

The Pocosin Lakes NWR in North Carolina experienced a wildfire that burned over 25,500 acres of the refuge starting June 4, 2008 and continues today. Most of the refuge, and its pocosin habitats burned in the wildfire. Fire behavior was extreme across the area due to extensive drought and wind events. As a result moderate to high burn severity was observed throughout most of the burned area. In addition, a tremendous fire fight occurred by the suppression forces to contain the wildfires within the refuge proper as well as extensive water handling operations to flood the soils. Heavy equipment was used extensively throughout the area to make contingency lines and create dams for water management. Both the impacts of the wildfire and the impacts of the suppression activities have immediate short and long term impacts on the natural resources of the refuge.

The long term impacts of the burned area damages include:

- Damaged refuge signs
- Damages to wood duck boxes
- Damages to the imperiled AtlanticWhite Cedar habitat and Damages to forested wetland habitats managed for wood ducks
- Introductions of invasive species

The refuge accepts that the rehabilitation for this site is a long term commitment and the attached plan is only one small part of the commitment needed to restore the damaged area.

In the Evans Road Fire Rehabilitation Plan the refuge is requesting funding following the wildfire to mitigate the immediate risks including treated any invasive species introductions immediately and reduce impacts to the natural resources. The break down of the costs are listed in the Specification tables in the plan.

According to US Fish and Wildlife Service, and Department of Interior Policy, the Regional Director may approve Rehabilitation Fund requests up to $500,000 after concurrence with Regional Fire Management Coordinator that the plan fits the technical definition for the use of rehabilitation funds.

After reviewing the Rehabilitation Plan for the Evans Road Fire at the Pocosin Lakes NWR, I recommend the request for the Rehabilitation funds (sub-activity -9262) be approved as written.

This plan with have to compete for appropriated rehabilitation funding with other Department of the Interior requests using common criteria as established by the National Rehabilitation Coordinators in consultation with the Office of Wildland Fire Coordination. Availability of funding for the completion of this plan will depend upon its priority ranking. Some additional values to consider in the ranking of this plan include:

- This project and its costs will be entered into NFPORS via the National Burned Area Response Coordinator for USFWS
- All actions described are allowable under the USFWS Rehabilitation Guide (2006) and 620 DM3.
- Action is necessary to minimize the negative impacts of wildfire on the status of special status species (Federal or Tribal listed species, Federal or Tribal candidate species, Species of special management concern) as listed in a conservation or recovery plan
- Planting commercial forest where identified in a land use plan or in a Tribal forest management plan when a Silviculturalist certifies that the land will not naturally regenerate in the desired species within ten years (deemed unrecoverable by Dr. Eric L. Hinesley- North Carolina State University)
- The work will be contracted at more than 50% for some specifications with 5 of the 6 treatmens containing contracting elements (# 1, #2, #4, #5, and #6)
- The treatment leverages federal dollars to achieve management objectives or provides a net benefit to the government because it is a cooperative project and includes volunteers and interns (Specifications #3, #4, #5, and #6).

Thank you for considering this plan for approval and funding.

Sue Wilder
Regional BAER Coordinator, R4
985-882-2008

Evans Road Fire
BURNED AREA REHABILITATION PLAN
Pocosin Lakes National Wildlife Refuge
August 2008

Aerial View of Evans Road Fire, Pocosin Lakes NWR

UNIT: Pocosin Lakes National Wildlife Refuge

LOCATION: Tyrell, Washington, and Hyde Counties, North Carolina

FIRE DATE: 06/01/2008

FIRE SIZE: 28,700 FWS lands (as of August 30, 2008)

PREPARED BY: Wendy Stanton
US Fish and Wildlife Service
Pocosin Lakes NWR
Refuge Biologist

Submitted By: Wendy D. Stanton **Date:** 9-9-2008
Wendy Stanton, BAER Team Leader, Pocosin Lakes NWR
BURNED AREA REHABILITATION PLAN REVIEW AND APPROVAL

I. Project Leader approval that the Burned Area Rehabilitation Plan meets approved land management plan management objectives.

9/9/2008

Project Leader, Pocosin Lakes National Wildlife Refuge Date

II. Regional Fire Management Coordinator concurrence that the plan fits the technical definition for use of Rehabilitation finding.

Regional Fire Management Coordinator, Region 4 Date

III. Rehabilitation Funding Approval (check one box below):

☐ Approved

☐ Approved with Revision (see attached)

☐ Disapproved

Regional Director, Region 4 Date

IV. Rehabilitation Funding Approval (check one box below):

☐ Approved

☐ Approved with Revision (see attached)

☐ Disapproved

National Office Date

EXECUTIVE SUMMARY

Introduction

This Burned Area Rehabilitation Plan has been prepared in accordance with Department of Interior and US Fish and Wildlife Service (FWS) Policies. This plan provides recommendations for all lands burned within the Evans Road Fire perimeter which lies within the Pocosin Lakes NWR administered by the FWS. The primary goals of the Evans Road Fire Burned Area Rehabilitation Plan are:

- Enhance native tree species colonization and promote the regeneration of pre-fire Atlantic white cedar ecosystems by replanting native tree species that will not regenerate naturally
- Utilize integrated management activities to improve lands unlikely to recover naturally from severe wildland fire damage by emulating historic ecosystem structure, function, diversity and dynamics according to approved management plans.
- Restore or establish healthy, functioning ecosystems, even if these ecosystems cannot fully emulate historic or pre-fire conditions as specified in the approved management plans.
- Monitor the post-burn establishment of invasive species and remove invasions immediately once detected.
- Provide wildlife nesting habitat destroyed by wildfire for managed wildlife species of concern.
- Replace damaged refuge signs that provide information to the public about hunting restrictions, refuge boundaries, closed areas
- Monitor rehabilitation treatments and treatment effectiveness.

This Plan addresses rehabilitation treatments recommended by the assessment team. Following control of the wildfire, an ad hoc Burned Area Assessment Team made up of the Refuge Manager, Fire Management Officer and Regional Fire Ecologist, NC State University professor, Wildlife Biologists from the refuge and Ecological Services office, and Foresters from North Carolina State Division of Forest Resources assessed damages caused by the wildfire. Of most concern was damage caused to the historic Atlantic white cedar Ecosystems of the refuge, destroyed forested wetland habitat used by wood duck populations for nesting and neo-tropical migrants, invasive species establishment and damaged minor facilities including refuge signs.

The Burned Area Assessment Team conducted on-site observations and noted damages. Burned Area Assessment Reports are provided including; 1) invasive species, 2) wildlife 3) forestry and soils, and 4) burn severity and are found in Appendix I. The individual rehabilitation treatment specifications, including treatment implementation and effectiveness are identified below in Part F. A summary of the costs can be found in Part E. Appendix II contains the National Environmental Policy Act (NEPA) compliance documentation summary. Appendix III contains associated Burned Area Maps. Appendix IV contains photo documentation of the wildfire. Appendices V, VI and VII contain supporting documentation.

Fire Background

The Evans Road Fire ignited on private lands adjacent to the refuge by lightning on Sunday June 1, 2008. Immediate initial response to suppress the fire on private lands was conducted by NC Forest Service. By 1800hrs on June 1st, the initial run of the fire ran to 750 acres off refuge with nearly 50% containment. At this time, 160 chains of line was estimated to be built to contain the fire. The fire was

burning in pocosin and deep organic soils with poor accessibility, and extensive groundfire. The fire was experiencing erratic winds, and extreme fire behavior of torching, crowning and medium-range spotting, making containment extremely difficult. Firefighters on the ground experienced heat-related illnesses. At this time there were 41 personnel on the fire. There were significant communities at risk at this time including; 1) waterfront drive, 2) Ponzer, 3) Kilkenny, 4) town of Creswell, 5) town of Columbia, and 6) town of Englehard, NC. Estimated acreage of the fire at this time was 750 acres.

By June 2nd, a Type III NC IMT team assumed responsibility for the wildfire. On this day, the fire continued to make significant runs and is immediately threatening the Pocosin Lakes NWR. Continued line construction and line reinforcement occurred as well as aircraft retardant drops and ground forces suppression efforts continued on the second day of this fire. A pole shed containing tractors and other high-valued farm equipment was significantly threatened. The fire continued to show high growth potential and extreme fire behavior. Additional resources threatened included Pocosin Lakes NWR and the New Lake community. At this time there were 37 personnel on the fire. Estimated acreage of the fire at this time was 1,700 acres.

By June 3rd, the fire had jumped established containment lines and made a significant run (over one mile) onto the Pocosin Lakes NWR. The fire no longer was contained and threatened the community of Lake Phelps along the lake's southern shoreline. The fire-fighting efforts continued to widened and reinforce lines with KG blades to the north and east of the fire. Aerial resources were used to drop water on hot spots within interior of firelines. Fire behavior continued to be extreme with high rates of spread, extensive residual ground fire and high reburn potential. High smoke potential and traffic problems associated with heavy smoke are also a challenge at this time. Further, standing trees that became unstable due to root systems damaged by fire have fallen into adjacent roadways and threaten fire-fighers in the vicinity without warning, making a very hazardous condition for personnel. Additional communities threatened included Pungo Lake community. The Type III team transitioned into a Type II at this time. Approximately 49 personnel are reported to work on the fire at this time. The fire is reported to be 8,345 acres at this time.

Over night on June 3rd, the fire made an additional significant run and by June 4th the fire was over 10,433 acres on the Pocosin Lakes NWR. Fire continued to spread into the eastern section of Pocosin Lakes NWR and advanced toward the north and eastern boundaries of the refuge. Fire behavior continued to be extreme with crowning, extreme rates of spread, long range spotting, heavy fuels burning, and extensive ground fire with high reburn potential. The fire continued to move towards Highway 94 and had the potential to spread to the Buckridge Coastal Reserve and reach the Alligator River. A mandatory evacuation of 39 homes in the Lake Phelps community along the southern shore of Lake Phelps was conducted by the Washington County Emergency Management. The fire continued to threaten the communities of: 1) Cross Lands, 2) New Lakes, 3) Kilkenny, 4) Gum Neck, and 5) town of Columbia. At this time a Type II team is in place. Additional resources of Air Tanker support, Heavy Tractor-Plow Strike Teams, Water Tenders and replacement forces are engaged in fighting the wildfire. The estimated acreage of the fire at this time was 13,090 acres.

By June 5th the fire continued to grow in size and additional evacuations occurred on Gall Road to New Lake Road and the Waterway Subdivision in Hyde County. A temporary shelter was established at the Ponzer Fire Department. Firefighters continued to establish new containment lines to the north and east of the fire using existing forest and farm access roads. The fire continued to show extreme fire behavior with individual tree and group torching. Fast runs and heavy reburn was also observed within the fire's

interior. Extensive ground fire continued. Fire continued to threaten communites. Additional resources needed included infrared interpreter, and Infrared flight for hot spot detection, Type 1 structure protection engines, and Type I helicopters as aerial resources. Approximately 104 total personnel were assigned to the fire. The fire was estimated at 28,570 acres.

By June 6th the fire continued to progress farther east and southeast into the Pocosin Lakes NWR. A State of Emergency was declared on 6/5/08 for Hyde, Tyrell and Washington Counties. A state-implemented burn ban also is in place for all three counties. Firefighters continue to hold all containment lines and continue water pumping operations from Phelps Lake to irrigate ground fire smouldering in an attempt to reduce the amount of peat soils burning. Structure protection continues by local fire departments and volunteer fire departments. The fire behavior is observed to be making short runs and torching with continued ground fire and smoldering in deep organic soils. There were 104 personnel assigned to the fire at this time. The fire was considered to be 40% contained and estimated to be 29,970 acres.

6/7/2008 to Present - The fire continued to progress further east into the interior of the Pocosin Lakes NWR. Water handling operations continued using high volume lift and PTO pumps to reinforce containment and assist in mop-up efforts. The fire showed moderate fire behavior with active running, torching and spotting in heavy brush fuels. There were 210 personnel assigned to the fire at this time. The fire size is estimated at 41,060 acres with no significant change in acreage. On 6/24/08 pumping from Lake Phelps was significantly reduced due to limitations on reducing lake levels. During this time, pumps were being re-located to improve water movement to new areas in an attempt to extinguish ground fire. Operations to obtain water from sources to the northeast side of the fire continued. Throughout this period re-burn, interior torching and small runs were observed with extensive creeping of ground fire in deep organic soils. There were approximately 300 – 350 personnel assigned to the fire during this period.

Fire Damages and Threats to Human Safety and Natural Resources

The Evans Road Fire that burned over Pocosin Lakes National Wildlife Refuge under extreme drought conditions from June 1, 2008 to present has been reported as one of the largest fire events on the refuge since the Allen Road Fire in 1985. Over 40,000 acres have been burned by the Evans Road Fire with more than 25,000 acres on the Pocosin Lakes NWR. To date, no fatalities or major accidents have been reported by the public or to firefighters during this event. However, significant damages have incurred to property (i.e., surrounding agricultural lands), as well as natural resources from high severity burn damages. To date, four structures have been reported lost to the fire. The Evans Road Fire has been declared a Disaster Designation for FEMA funding. While the State of North Carolina is pursuing avenues of compensation to private land owners who suffered damages from the fire, the federal lands impacted by damages are described in this Evans Road Fire Rehabilitation Plan. A significant amount of repair efforts are ongoing to repair the damages due to the fire suppression activities on refuge lands and are being conducted under the actions of the Incident Management Teams and Agency Administrator as described in the 2008 FWS Fire Management Handbook and 2008 Interagency Standards for Fire and Fire Aviation Operations Redbook as well as the Fire Suppression Repair Plans developed and coordinated by the Agency Administrator and the Incident Management Teams. The current burned area poses no additional threat to human safety or cultural resources in the area where immediate actions are needed for stabilization.

A Post-Fire Assessment Team was formed to assess damages to forestry, wildlife, hydrology, soils, vegetation and invasive resources as well damages to minor facilities within refuge lands as a result of this fire. The Assessment Team Composition is listed in Part D of this Rehabilitation Plan. The Assessment Reports are given in Appendix I. These reports include assessments of damages due to fire suppression activities as well as burned area damages. A summary of the assessments of burn damages caused by this wildfire to natural and cultural resources as well as minor facilities is described below.

Forestry and Soils

Atlantic white cedar (Chamaecyparis thyoides) Rehabilitation

- **Vegetative cover has been destroyed on most of the 40,000+ acre burned area. The soil across this area is peat (primary soil series Pungo; peat ≥ 60 inches). In most areas of the fire more than 4 inches of peat was consumed and in some areas deeper than 5 feet consumption was evident. Any chance for natural regeneration of Atlantic white cedar from the seed bank within the fire perimeter was eliminated by the deep consumption of peat soils by the fire. The refuge has a unique opportunity to restore Atlantic white cedar by replanting and replenishing the seed bank as well as preserving a component of the pre-fire historic landscape and ecosystem.**

The rehabilitation of Atlantic white cedar is of particular interest because the Nature Conservancy designated the Atlantic white cedar ecosystem as a critical, globally threatened ecosystem and because the area is vitally important as a water filter for the Albemarle Pamlico Estuary. Ecologically, Atlantic white cedar is an important species in the wetland forests of eastern NC and Virginia and to the refuge lands. Historically, the largest assemblage of Atlantic white cedar was in the Great Dismal Swamp ecosystem (NC/VA) (FWS 1999). Woody residue imbedded in the peat indicates that Atlantic white cedar and baldcypress forests grew in these areas at one time (exact age unknown) (FWS 1999). Long ago, Atlantic white cedar was the most valuable forest tree species in the eastern coastal swamps because of its timber value. Prior to refuge ownership, evidence shows that Atlantic white cedar had been logged extensively, including inside the fire perimeter. Remnants of Atlantic white cedar stumps and logs buried in the peat have been observed in various locations throughout the refuge (Dr. Eric Hinesley, personal communication, 2008). Former Pettigrew State Park Superintendent, Sid Shearin (personal communication, 2007) remembered seeing natural stands of Atlantic while cedar in the 1970s along Allen and Boerma Roads. Prior to the fire, some Atlantic white cedar stands were present within the fire perimeter on the 500 acre Pettigrew State Park Block (Pettigrew State Park Ranger, personal communication, 2002, 2008). This block is located adjacent to the northern boundary of the refuge between Evan's and Ferebee Roads A 1960 forest type map for the West Virginia Pulp and Paper Company delineate forest stands east of Western Road. Large stands of Atlantic white cedar were present throughout the Juniper Branch Unit located between Middle and Seagoing Roads and north in the Phelps Unit located between Middle and Northern Roads (see map of Historic Forest Resources - Appendix III).

Today, the existing Atlantic white cedar is only a small fraction of that which existed 100 years ago due to timber harvest and wetland drainage. The amount that remains on the Refuge, excluding plantings, is very small compared to its original distribution. In most of the Albemarle peninsula, it was wiped out by a combination of exploitive logging, wildfire, and wetland drainage for logging access and agriculture. Atlantic white cedar is an early succession species that accumulates a seed bank in the

surface layer of peat, and can regenerate following catastrophic events (fire or blow-down from a hurricane) when seed sources are available. Severe wildfires eliminate the seed bank when the peat is consumed. As a result, there is no remaining seed source to regenerate Atlantic white cedar naturally. Restoration and regeneration requires artificial regeneration with seedlings. Once established, the area occupied by Atlantic white cedar can expand through natural regeneration from seed dispersal. Atlantic white cedar does not tolerate long-term flooding, but is suited to sites where the water table is 4 to 12 inches below the soil surface during the growing season. It can grow on deep peat, typically underlain by sand. Fortunately the refuge is in a unique position to be able to control water levels to some degree within the burn area as evidenced by the fire suppression actions.

Mature Atlantic white cedar bogs provide a unique habitat that has naturally acidic waters and is cooler than surrounding hardwood swamps or pinelands. Cedar bogs support high breeding bird densities (425 to 554 pairs per 100 acres or 40 ha) of species such as ovenbirds (*Seiurus aurocapillus*), yellowthroats (*Geothlypus trichas*), and prairie, prothonotary, and hooded warblers (*Dendroica discolor, Protonotaria citrea, and Wilsonia citurna*, respectively). Hessel's hairstreak (*Mitouri hesseli*), a butterfly, uses Atlantic white cedar exclusively. Black bear (*Ursus americanus*), river otter (*Lutra canadensis*), and bobcat (*Felis rufus*) are numerous in cedar bogs, as are the State-listed eastern diamond-back rattlesnake (*Crotalus adamanteus*). The federally-listed red-cockaded woodpecker (*Picoides borealis*) inhabits mature pond pines that are scattered around cedar bogs.

Within three years, 700 acres of Atlantic white cedar would be rehabilitated in suitable locations throughout the burned area. Small, 10 acre blocks of cedars at a density of 300 trees / acre (10 ft X 13 ft spacing) would be planted. These spacings have produced successfully viable Atlantic white cedar stands on the refuge. Field observations ascertained an increase in the cedar seed bank in the soil and natural regeneration occurring around the seed trees and areas located adjacent to the originally planted cedar stands from wind-blown seeds. The planted cedar seedlings would be containerized 1-0 (1 year in nursery container) with North Carolina seed sources. The Atlantic white cedar rehabilitation sites would be monitored annually for five years as in accordance to the Tree Survival Protocol.

Baldcypress Rehabilitation

- **In addition to the physical loss of existing cypress trees in high burn severity areas of the fire, deep peat consumption destroyed the seed bank and will require regeneration by seedlings to establish a local seed source.**

Baldcypress (*Taxodium distichum*) is another important wetland tree species to the refuge that has been significantly impacted by the fire. It is valuable to Federal trust species and other wildlife for mast, den trees, roosting sites, cover, and nest sites. Cypress is more tolerant of long-term flooding than Atlantic white cedar, helping to account for its presence in riverine swamps. Compared to Atlantic white cedar, it tends to occur in wetter sites. Although found on a wide variety of sites, it is more nutrient demanding than Atlantic white cedar, and commonly grows in brown water swamps where there is sedimentation. However, it can grow in a wide variety of settings, including nutritionally sterile peat lands. If the water is moving, the effective nutrient status is greater compared to stagnant water, and the trees remove the nutrients from the passing water, reducing the nutrient loading moving downstream to estuaries. Cypress grows best where the peat is less than 40 inches deep, and the roots can reach mineral soil beneath the peat, especially if the subsoil is clay.

The deep ground fire destroyed existing baldcypress trees and the cypress seed bank. Planting cypress in suitable locations thoughout the burn area will restore this important species to the refuge. Within three years, 700 acres of baldcypress at a density of 440 trees/acre (10ft X 10 ft) would be rehabilitiated. The baldcypress seedlings would be from North Carolina seed sources and 1-0 bare-root seedlings (one year in a seedbed).

Dr. Eric Hinesley in front of an Atlantic white cedar stand located on Boerma Road, Pocosin Lakes National Wildlife Refuge.

Cultural

- **No significant historic properties or archaeological sites have been impacted by the Evans Road Fire.**

There have been limited archaeological investigations within the refuge. The wetland environment of the refuge makes it unlikely that there are many cultural resources on the refuge (FWS 2007).

Richard A. Kanaski RHPO/RA 9/8/08

Richard Kanaski, Regional Archaeologist, Southeast Region Date

Wildlife

- **Forty of the 150 wood duck boxes have been destroyed by fire.**

Refuge habitat types burned in the Evans Road Fire include Pocosin, Bay Forest, Atlantic white cedar Forest Habitat, Hardwood Swamp Forest, and Cypress/Gum Swamps. Key wildlife species habitat impacted in the burned area includes; black bear, brown-headed nuthatch, red-headed woodpecker, American bobwhite quail, Chuck-will's-widow, American woodcock, neo-tropical migratory birds, canebrake rattlesnake, green tree frog, Swainson's warbler, Prothonotary Warbler, yellow-throated warbler, wood duck, American Black Duck, white-tailed deer, and American alligator (FWS draft CCP 2007). Of the list above, impacts to the wood duck populations are one of the highest concerns to the refuge following the wildfire because of the loss of natural cavity trees and nest boxes. The endangered red-cockaded woodpecker and the endangered red wolf populations on the refuge do not seem to be impacted by the wildfire at this time.

Wood Ducks - One of the waterfowl management programs at Pocosin Lakes NWR is to provide breeding habitat for wood ducks, a nationally recognized declining waterfowl species due to habitat loss. According to the draft CCP (FWS 2007), an active program of maintaining 150 wood duck boxes in appropriate wood duck habitat is a continuing waterfowl management objective for the refuge. Wood duck boxes were located along ditches and waterways following refuge protocols to supplement existing nesting cavity tree resources available. Wood duck boxes were maintained annually by staff and volunteers. Following the fire most cavity nest trees within the high severity burn areas were destroyed by fire. Forty wood duck boxes were damaged and destroyed and will need to be replaced.

Invasive species

- **Continued monitoring and treatment are necessary to remove any invasive species established following fire.**

Invasive species of plants and animals known to occur on the refuge include: Phragmites (Phragmites australis), alligator weed (Alternanthera philoxeroides), Japanese Stiltgrass (Microstegium vimineaum), parrotfeather (Myriophyllum aquaticum), Sesbania (Sesbania exaltata), Japanese Honeysuckle (Lonicera japonica), Canada thistle (Cirsium arvense), Chinese privet, (Ligustrum sinense), fire ants (Solenopsis invicta), gypsy moth (Lymantria dispar), nutra (Mocastor coypus), European starling (Sturnis vulgaris), house sparrow (Passer domesticus), coyote (Canis latrans) and feral hog (Sus scrofa) (FWS Draft CCP 2007). As stated in the draft CCP, one objective for the refuge is to improve plant communities and limit impacts to refuge resources by monitoring, controlling, or eradicating pest plants as necessary. One strategy to achieve this objective is to monitor selected pest plants on a systematic basis, and implement early detection and rapid response pest plan control measures with refuge staff, contractors, and cooperating agencies and organizations.

Infestations of Phragmites (Phragmites australis), alligator weed (Alternanthera philoxeroides) and Japanese Stiltgrass (Microstegium vimineaum) are known to occur in established populations on and adjacent to the refuge boundary and fire perimeter. There is an aggressive invasive species removal program on the refuge which includes chemical (aerial and ground application herbicide) and mechanical (hand-pulling) treatments that have successfully removed invasive species from the refuge. On an annual basis, any existing populations are GPS'ed, and treated accordingly. All treatments have been implemented and proved successful following established refuge protocols based on published information.

Critical areas that could lead to further encroachment of invasive species and threaten natural resources include hardwood forest and pocosin habitats, lakeshore habitat along New Lake and areas of roadsides, ditches, canals, staging areas, dozer lines and other mechanically disturbed sites that threaten native habitat. Of particular interest are threats to natural resource habitats and uninfested areas within the fire perimeter. All newly established populations should be removed immediately once detected.

Minor Facilities

- **Refuge boundary signs, restricted area signs and hunting restriction signs have been destroyed by fire.**

Approximately 34 miles of refuge boundary have been severely impacted by the wildfire. As a result refuge boundary signs, restricted area signs and hunting restrictions signs have been lost to the fire and will need to be replaced. The need to replaced damaged wood duck boxes has been addressed in the wildlife section above.

Management Requirements

The Comprehensive Conservation Plan (CCP) for the Pocosin Lakes National Wildlife Refuge and the Fire Management Plan are currently in Draft form and awaiting final approval (FWS 1999, 2007). These documents provide the long-term guidance for management decisions; sets forth goals, objectives, and strategies needed to accomplish refuge purposes; and identifies the Fish and Wildlife Service's best estimate of future needs. The Draft CCP provides the basic field unit information and issues that will

affect the proposed rehabilitation actions.

As described in the draft CCP, Congress established the 12,000 acre Pungo NWR in 1963 by the authority of the Migratory Bird Conservation Act of 1929 and the Fish and Wildlife Act of 1956. The Service established the Pocosin Lakes NWR in 1990 and made the Pungo Refuge a unit of the refuge. The refuge now includes 110, 106 acres.

The refuge was established as a refuge to protect and conserve migratory birds and other wildlife resources through the protection of wetlands. The following objectives for the refuge were established in the Interim Management Plan completed soon after the establishment of the Pocosin Lakes NWR:

- To protect and enhance habitat for those species which are classifies as endangered, threatened, or of special concern;
- To protect and restore wetlands which will contribute to the Presidential Initiative of "No Net Loss of Wetlands;"
- To protect the watershed of nearby lakes, rivers and estuaries which support recreational and commercial fisheries and which provide wintering habitat for Canada geese, snow geese, tundra swans, and a variety of ducks;
- To protect and enhance production habitat for wood ducks and songbirds and winter habitat for other waterfowl;

The objectives that are applicable to this Rehabilitation Plan are briefly described below. A more detailed discussion of each objective is described in the draft CCP (FWS 2007);

GOAL 2. Restore, protect, and enhance pocosin wetlands and other natural habitats for optimum biodiversity. Intensely manage habitats specific to waterfowl on the Pungo Unit.

Objective: Pocosin

Manage 61, 288 acres of pocosin, including forest, shrub, and herbaceous stages, to maintain it as a natural community. Depending on locations and timing of opportunities, convert 2,900 acres of herbaceous or shrub stage pocosin to Atlantic white cedar, hardwood swamp forests, moist soil-units and firebreaks.

***Strategies*:** Restore 700 acres of shrub or grass stage pocosin to Atlantic white cedar Forest

***Strategies*:** Restore 1,500 acres of shrub or grass stage pocosin to bottomland hardwood forest.

Objective: Peatland Atlantic white cedar Forest

Manage 3,824 acres (3,124 existing acres and 700 newly restored acres) of functional peatland Atlantic white cedar Forest habitat to maintain it as a natural community.

Strategies: Convert 700 acres of pocosin habitat in the shrub or grass stage to peatland Atlantic white cedar Forest.

Objective: Hardwood Swamp Forest

Manage 15, 545 acres (14,045 existing acres and 1,500 newly restored acres) of healthy, functional hardwood swamp forest habitat to maintain it as a natural community.

Strategies: Plant 1,500 acres of pocosin with shallow peat soil in the shrub or grass stage to hardwoods to maintain a healthy, functional hardwood swamp forest habitat community.

Objective: Cypress Gum Forest

Manage 970 acres of healthy, functional cypress/gum swamp habitat to maintain it as a natural community.

Objective: Natural Lake Shoreline
Manage 446 acres of healthy, functional natural lake shoreline habitat to maintain it as a natural community.

Strategies: Manage undesirable vegetation as necessary.

Objective: Wood Duck Nest Boxes
Maintain up to 150 wood duck nest boxes in appropriate wood duck habitat annually.

TABLE OF CONTENTS

PART A - FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Evans Road Fire
Fire Number	D7L1
Agency Unit	Pocosin Lakes NWR
Region	R-4, Southeast Region
State	NC
County(s)	Tyrell, Washington, Hyde Counties
Ignition Date/Cause	June 4, 2008 / lightning
Zone	FWS Fire Management District 1 R4
Date Fully Contained	8/25/2008? (3yrs = 8/25/2011)
Jurisdiction	28,700 acres

PART B - NATURE OF PLAN

Type of Action (check one box below)

X	Initial Submission
	Amendment to the Initial Submission

PART C - REHABILITATION ASSESSMENT

Overall Rehabilitation Objectives:

- *Develop a Rehabilitation Plan*
- *Replace refuge signs burned by wildfires*
- *Replace destroyed wood duck boxes burned by wildfires*
- *Monitor further damages to natural vegetation due to the introduction of invasive species in the burned area and remove invasive species from areas of introduction caused by the wildfires*

- *Replant native cypress tree seedlings where it will not regenerate naturally as defined by assessment thresholds*
- *Replant Atlantic white cedar tree seedlings where it will not regenerate naturally as defined by assessment thresholds*

PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS

I. Burned Area Emergency Response Team Members:

Position	Team Member (Agency)
Refuge Manager, Agency Administrator	Howard Phillips, Pocosin Lakes NWR
Deputy Refuge Manager, Facilities, Hyrdrology	David Kitts, Pocosin Lakes NWR
FMO, Forestry	Vince Carver, Pocosin Lakes NWR
Biologist, Wildlife, Environmental Specialist, Invasive Species, Team Lead	Wendy Stanton, Pocosin Lakes NWR

III. Resource Advisors: (Note: Resource Advisors are individuals who assisted the Burned area emergency response team with the preparation of the plan. See Part H for a full list of agencies and individuals who were consulted or otherwise contributed to the development of the plan.)

Name	***Affiliation***
Sue Wilder, PhD	Regional Fire Ecologist, Fire Management Field Office, Lacombe, LA 985-882-2008
Whit Lewis	Whit Lewis, Regional Integrated Pest Management / Farming Coordinator,
Richard Kanaski	Regional Archaeologist, Southeast Region, Savannah, GA, 912-652-4415 x 113
Dr. L. Eric Hinesley	Professor, Dept Horticulture, NC State University, Raleigh, NC, 919-515-1223
Mike Wicker	Fish and Wildlife Biologist, Raleigh ES Office, Raleigh, NC, 919-856-4520 X 22
Sara Ward	Environmental Specialist, Raleigh ES Office, Raleigh, NC 919-856-4520 X 30
Chuck Kemp	NC DOT, Plymouth, NC 252-796-2115 (cell)

PART E - SUMMARY OF ACTIVITIES AND COSTS

The summary of activities and cost table below identifies rehabilitation costs charged or proposed for funding from sub-activity 9262 funding sources.

REHABILITATION ACTIVITIES COST SUMMARY TABLE – Evans Road Fire

Spec #	Project Title	Unit	Unit Cost	# Units	Work Agent**	Fiscal Years	Cost
1	Plan Development	EA	$9,163	1	FA	2009	$9,163
2	Sign Replacement	EA	$12,523	1	FA	2009-2011	$12,523
3	Wood Duck Box Replacements	EA	$14,686	1	FA, V	2009-2010	$14,686
4	Invasive Species Monitoring	EA	$60,677	1	FA, SC, V	2009-2011	$60,677
						TOTAL	**$97,049**

** **Work Agent**: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

PART F - INDIVIDUAL SPECIFICATION, Specification #1

TREATMENT/ACTIVITY NAME	Rehabilitation Plan Development	**PART E SPECIFICATION #**	# 1
NFPORS TREATMENT CATEGORY*	Planning	**FISCAL YEAR(S) (list each year):**	2009
NFPORS TREATMENT TYPE *	BAR Plan	**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Red Wolf

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Prepare the Rehabilitation Plan following the Evans Road Fire that occurred on the Pocosin Lakes National Wildlife Refuge, 2008 based on assessments from burn severity maps and aerial photography.

B. Location/(Suitable) Sites: Evans Road Fire, Pocosin Lakes NWR

C. Design/Construction Specifications:

1. Develop Rehabilitation Plan based on post-burn assessments and land management plan objectives (FY2009).
2. Write specifications based on assessment data and planning team recommendations (FY2009).
3. Submit plan for approval and secure funding from appropriate sources (FY2009).
4. Per policy, complete annual reports with monitoring narratives and cost details (as completed).

D. Purpose of Treatment Specifications: To prepare a comprehensive Rehabilitation Plan to rehabilitate degraded and destroyed natural resources and minor facilities damaged by the wildfire that will not recover naturally.

E. Treatment Effectiveness Monitoring Proposed: check for completion FY2009.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES:	**COST / ITEM**
GS-12 Fire Ecologist @ $50/hr X 24 hrs X 1 year	$1,200
GS-11 Biologist @ $42/hr X 24 hrs X 1 year	$1,008
GS-9 Administrative Officer @ $35/hr X 8 hrs X 1 year	$280
GS-7 technicians @$28/hr X 40hrs X 2 technicians X 1 year	$2,240
* all salaries include benefit estimates of 40% based on 2008 OPM Base Salary Tables	
TOTAL PERSONNEL COSTS	**$4,728**
EQUIPMENT PURCHASE, LEASE AND/OR RENT	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	$0
MATERIALS AND SUPPLIES	**COST / ITEM**
Miscellaneous Office and Field supplies X 1 year	$250
TOTAL MATERIALS AND SUPPLY COST	**$250**
TRAVEL COST	**COST / ITEM**
per diem @ $39 per day X 5 days X 1 year X 3 people	$585
Lodging @ $70 per day x 5 days X 1 year X 3 people	$1,050
Air travel @ $1,500 per trip X 1 trip X 1 year	$1,500
Gas for site visits @ $50/day X 5 days X 1 year X 3 people	$750

Vehicle rental @ $300/week X 1 year	$300
TOTAL TRAVEL COST	**$4,185**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
Immediate Post-burn severity map-USGS ($1250 paid by fire suppression account)	$0
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY:

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY__09	10/01/2008	9/30/2009	FA	1	$9,163	1	$9,163
FY_10							
FY_							
FY__							
						TOTAL	**$9,163**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE:

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	**P, M, T**
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	**P,M, T**
5.	No cost estimate required - cost charged to Fire Suppression Account	**C**

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Rehab Map of Evans Road Fire, Appendix III.

TOTAL COST BY JURSIDICTION:

JURISDICTION	UNITS TREATED	COST
Pocosin Lakes NWR - FWS	1	$9,163
	TOTAL COST	**$9,163**

PART F - INDIVIDUAL SPECIFICATION, Specification #2

TREATMENT/ACTIVITY NAME	Replace Refuge Signs	**PART E SPECIFICATION #**	# 2
NFPORS TREATMENT CATEGORY*	Roads	**FISCAL YEAR(S) (list each year):**	2009, 2010, 2011
NFPORS TREATMENT TYPE *	Replace Administrative Facilities	**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Red Wolf

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Replace Fire Damaged Refuge Signs (Boundary, Closed road and Non-toxic shot only signs). Replace information kiosk fire panel with updated Evans Road Fire information.

B. Location/(Suitable) Sites: Refuge signs along refuge boundary within the Pocosin Lakes NWR on refuge lands, includes updating customized information panel of refuge fire history to include Evans Road Fire and replace road closure, and restriction signs burned by the wildfire.

C. Design/Construction Specifications:
1. A crew of two GS-7 Technicians will identify and replace damaged signs caused by fire damages from the Evans Road Fire wildfire on Pocosin Lakes NWR (FY 2009, 2010, 2011)
2. Purchase replacement signs, posts, nails and screws that meet USFWS boundary sign specifications (FY 2009).
3. Replace damaged signs with new signs. Where signs are replaced on trees, use aluminum nails to fasten to trees. Where signs are replaced on posts, use bolts to attach to u-channel posts. Additional posts may be replaced as needed (FY2009, 2010, 2011).

D. Purpose of Treatment Specifications: To identify refuge managed lands, specific restriction locations and identified road closed areas.

E. Treatment Effectiveness Monitoring Proposed: check for implementation and completion in FY 2011.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES:	**COST / ITEM**
Crew of 2 GS-7 Technicians ($28/hr X 40 hrs X 2 technicians) X 3 years	$6,720
(*all salaries include benefit estimates of 40% based on 2008 OPM Base Salary Tables)	
TOTAL PERSONNEL COSTS	**$6,720**
EQUIPMENT PURCHASE, LEASE AND/OR RENT	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**
MATERIALS AND SUPPLIES	**COST / ITEM**
150 Aluminum Non-reflective Signs @ $7.35 ea ($7.35 X 150)	$1,103
100 U-channel posts @ $30 ea ($30 X 100)	$3,000
Miscellaneous hardware (nails, bolts, nuts, wrench, hammer, etc.)	$200
TOTAL MATERIALS AND SUPPLY COST	**$4,303**
TRAVEL COST	**COST / ITEM**

Vehicle Gas @ $50 per day X 10 days X 3 years	$1,500
TOTAL TRAVEL COST	**$1,500**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY:

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY__09	10/01/2008	09/30/2009	FA	signs	$47	150	$7,043
FY_10	10/01/2009	09/30/2010	FA	signs	$18	150	$2,740
FY_11	10/01/2010	09/30/2011	FA	signs	$18	150	$2,740
FY__							
TOTAL							$12,523

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE:

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	**P,T, M**
5.	No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Rehab Map of Evans Road Fire, Appendix III.

TOTAL COST BY JURSIDICTION:

JURISDICTION	UNITS TREATED	COST
Pocosin Lakes NWR - FWS	28,700	$ 12,523
	TOTAL COST	$ 12,523

PART F - INDIVIDUAL SPECIFICATION, Specification # 3

TREATMENT/ACTIVITY NAME	Replace Damaged Wood Duck Boxes	**PART E SPECIFICATION #**	# 3
NFPORS TREATMENT CATEGORY*	Facilities and Infrastructure	**FISCAL YEAR(S) (list each year):**	2009, 2010
NFPORS TREATMENT TYPE *	Replace Administrative Facilities	**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Wood Ducks

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Replace fire damaged wood duck boxes burned by wildfire.

B. Location/(Suitable) Sites: Locations of existing wood duck boxes burned by the wildfire are along ditches, canals and wetland habitats.

C. Design/Construction Specifications:
1. A crew of two GS-7 Technicians, and volunteers will identify and replace damaged wood duck boxes caused by fire damages from the Evans Road Fire wildfire.
2. Purchase 40 new wood duck nest boxes, predator guards, posts and hardware to replace damaged boxes. (FY 2009).
3. Within two years install the 40 new boxes in identified locations (FY 2009 and FY 2010)

D. Purpose of Treatment Specifications: To provide artificial nest boxes for wood ducks to nest in that were destroyed by wildfire.

E. Treatment Effectiveness Monitoring Proposed: Check for implementation and completion in end of FY2010.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES:	**COST / ITEM**
Crew of 2 GS-7 Technicians ($28/hr X 80 hrs X 2 technicians X 2 years	$8,960
GS-11 biologist project supervisor ($42/hr X 24hrs X 2 years)	$2,016
Volunteers	$0
(*all salaries include benefit estimates of 40% based on OPM 2008 Salary Tables)	
TOTAL PERSONNEL COSTS	**$10,976**
EQUIPMENT PURCHASE, LEASE AND/OR RENT	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**
MATERIALS AND SUPPLIES	**COST / ITEM**
40 Wood Duck Boxes @ $60 ea (40 X$24) X 1 year	$960
40 Predator Guards @ $20 ea (40 X 20) X 1 year	$800
40 U-channel posts or steel posts @ $20 ea ($20 X 40) X 1 year	$800
Miscellaneous hardware (nails, bolts, washers) X 1 year	$150
TOTAL MATERIALS AND SUPPLY COST	**$2,710**
TRAVEL COST	**COST / ITEM**

Vehicle Gas @ $50 per day X 10 days X 2 years	$1000
TOTAL TRAVEL COST	**$1, 000**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY:

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY_09	10/01/2008	09/30/2009	FA, V	boxes	$217	20 installed	$8,698
FY_10	10/01/2009	09/30/2010	FA, V	boxes	$150	20 installed	$5,988
FY_ FY__							
TOTAL							**$14, 686**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE:

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	**P,T, M**
5.	No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Rehab Map of Evans Road Fire, Appendix III.

TOTAL COST BY JURSIDICTION:

JURISDICTION	UNITS TREATED	COST
Pocosin Lakes NWR - FWS	28,700	$ 14,686
	TOTAL COST	**$ 14,686**

PART F - INDIVIDUAL SPECIFICATION, Specification # 4

TREATMENT/ACTIVITY NAME	Invasive Plant Species Control	**PART E SPECIFICATION #**	# 4
NFPORS TREATMENT CATEGORY*	Invasive Species	**FISCAL YEAR(S) (list each year):**	2009, 2010, 2011
NFPORS TREATMENT TYPE *	Chemical/Mechanical Control	**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Red Wolf

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Utilize integrated pest management practices (prescribed fire, mechanical, and chemical control methods), as appropriate to immediately treat undesirable exotic species known to exist near the fire perimeter on the refuge for the Evan's Road Fire and as defined by monitoring (See Rehab Map, Appendix III).

B. Location/ (Suitable) Sites: Control all invasive species as defined by annual assessments. Locations will be prioritized based on burn severity, amount of fire suppression activities and location to established populations nearby or adjacent to the refuge boundary.

C. Design/Construction Specifications:

- Control the establishment of non-native invasive weeds within the burn area on the refuge with annual assessments at a minimum and immediate chemical or mechanical treatments. Monitoring of invasive species patches along refuge roads will be conducted monthly from March through September. Patches will be mapped with GPS and monitored to assess size of encroachments and effectiveness of treatments. Areas inaccessible from the ground (e.g., interior of refuge and around perimeter of Pungo Lake and New Lake) will be monitored aerially during summer months. Sites observed aerially will be mapped with GPS and treatments applied via crop duster or helicopter. Infestations of Phragmites (*Phragmites australis*), alligator weed (*Alternanthera philoxeriodes*), and Japanese stiltgrass (*Microstegium vimineum)* are known to occur in established populations on and adjacent to the refuge boundary. Multiple treatments and monitoring up to three years will be required with a variety of control techniques. Ground and/or aerial application as in accordance to label instructions of FWS approved chemicals including but not limited to glyphosate (AquaStar, Rodeo, AquaNeat), imazapyr (Habitat) will be required. These chemicals have been shown to be effective treatments in the management of *Phragmites*, alligator weed and *Microstegium* at Pocosin Lakes Refuge as part of the refuge's integrated pest management program. Timing of application may need to be adjusted to ensure treatment of each species is conducted in the proper phenological stage to ensure the protection and recovery of native and endemic species (FY 2009, 2010, 2011).

- Mechanical techniques will be implemented to manage *Phragmites* and *Microstegium* (FY 2009, 2010, 2011). Precribed Fire will also be implemented to control *Microstegium* (FY 2010, 2011).

D. Purpose of Treatment Specifications: Immediately treat existing noxious weed occurrences to prevent spread onto non-infested sites within the burn area. Protect the ecological integrity and site productivity of threatened or endangered plant and animal species and their associated habitats on lands administered by the Pocosin Lakes NWR. Prevent spread of noxious weeds into fragile or critical habitats of T&E species within and adjacent to the refuge.

E. Treatment Effectiveness Monitoring Proposed: Spot checking of noxious weed sites to ensure control methods are meeting management objectives will occur annually at a minimum. A staff person from the Pocosin Lakes NWR will visit sites controlled within two weeks after initial treatment; this is especially important for weed populations that are sprayed to ensure effectiveness of herbicide application.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES:	COST / ITEM

GS-11 Biologist @ $42/hr X 40 hrs x 3 years	$5,040
Biology Interns and Refuge Volunteers ($100/week X 3 wk X 3 yr)	$ 900
Contract Administration (GS-9@ $35/hr X 16hrs X 3 yrs)	$1,680
(*all salaries include benefit estimates of 40% based on 2008 OPM Base Salary Tables)	
TOTAL PERSONNEL COSTS	**$7,620**
EQUIPMENT PURCHASE, LEASE AND/OR RENT	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**
MATERIALS AND SUPPLIES	**COST / ITEM**
Field and Office supplies @$125 per year X 3 years	$ 375
Habitat Herbicide @ 0.125 gallon per acre X $245 per gallon (2008 pricing) X 50 acres X 3 years	$4,594
Surfactant @ 0.125 gallons per 50 acres X $50 per gallon X 3 years	$ 938
TOTAL MATERIALS AND SUPPLY COST	**$5,907**
TRAVEL COST	**COST / ITEM**
Vehicle Gas @ $50 per day X 5 days X 3 years	$750
TOTAL TRAVEL COST	**$750**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
Prescribed Fire @ $20/acre X 50 acres X 2 years (FY 2010, 2011)	$2,000
Control weeds with herbicides, contract estimation of 50 acres @ $200 per acre x 3 years	$30,000
Aerial herbicide application @ $1,200 per hr X 4 hrs X 3 years	$14,400
TOTAL CONTRACT COST	**$46,400**

SPECIFICATION COST SUMMARY:

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY__10	10/01/2009	09/30/2010	FA, SC, V	acres	$391	50	$19,559
FY_11	10/01/2010	09/30/2011	FA,SC, V	acres	$411	50	$20,559
FY_12	10/01/2011	9/30/2012	FA, SC, V	acres	$411	50	$20,559
						TOTAL COST	**$60,677**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE:

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	**C,P, M**
3.	Estimate supported by cost guides from independent sources or other federal agencies	**C**
4.	Estimates based upon government wage rates and material cost.	**P, M**
5.	No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Rehab Map of Evan's Road Fire, Appendix III

TOTAL COST BY JURSIDICTION:

JURISDICTION	UNITS TREATED	COST
Pocosin Lakes NWR - FWS	28,700	$60,677
	TOTAL COST	**$60,677**

PART G - RESTORATION REQUIREMENT

The following are post-rehabilitation implementation, operation, maintenance, monitoring, and evaluation actions beyond three years from fire control to ensure the effectiveness of initial investments. Costs for monitoring and survival studies will be incurred by the refuge.

Restoration beyond Rehabilitation

Pocosin Lakes NWR is focused on restoring and enhancing the natural habitat diversity of the refuge. Restoration of Atlantic white cedar forests is a priority under the CCP. Refuge staff will continue to monitor the effectiveness of rehabilitation treatments and seedling survival following the initial rehabilitation effort described in this plan. If any spot applications of herbicide are required to control invasive species competition that will be accomplished with refuge staff and equipment. The number of seedlings per acre was determined to allow for some mortality, yet low enough that no thinning harvest should be needed in the future. An additional goal of the spacing design is to allow future seed collections to occur by having a wider spacing design between rows of trees that will permit seed harvesting equipment use.

Activities the refuge will continue to participate in as part of long term restoration efforts beyond the scope of this rehabilitation plan include:

- **The refuge will continue to monitor and maintain refuge signs beyond the scope of this rehabilitation plan.**
- **The refuge will continue to monitor and maintain wood duck boxes as part of the overall refuge wood duck management program as needed.**
- **The refuge will continue to monitor for invasive species establishments beyond the scope of this rehabilitation plan.**

PART H – CONSULTATIONS

In addition to the list of resource advisors presented in Table III, the following individuals were contacted for consultation for rehab plan development:

Dr. Joseph O'Brien, Research Scientist, Southern Forest Research Station, USFS, Athens, GA
Randy McKinley, Contractor, Burn Severity Mapping Project, USGS, Sioux Fall, SD
Dr. Eric Hinesley, Professor, North Carolina State University, Raleigh, NC
Mike Wicker, Wildlife Biologist, Raleigh Ecological Services, Raleigh, NC
Rufus Crooms, Natural Resources Conservation Service, Plymouth, NC
Bill Edwards, Natural Resources Conservation Service, Plymouth, NC
Kendall Smith, Private Lands Biologist, USFWS, Windsor, NC
David Brownlie, Regional Fire Ecologist, Southeast Region, USFWS, Tallahassee, FL
Laura Mitchell, Regional Fire Biologist, Northeast Region, USFWS, Suffolk, VA
Bill Pickens, Forester, North Carolina Division of Forest Resources, Raleigh, NC
Ken Roeder, Forester, North Carolina Division of Forest Resources, Raleigh, NC

APPENDIX I - BURNED AREA ASSESSMENT REPORTS

1. Invasive species Report

Evans Road Wildfire
Post-Fire Invasive Species Assessment Report
Wendy Stanton, Refuge Biologist, Pocosin Lakes NWR
July 2008

Assessment Approach

The post-fire invasive species assessment was based on current fire behavior knowledge, suppression activities locations, and knowledge of existing invasive species populations on the refuge. Several field trips have been made throughout the refuge for visual observations of the impacts of fire on the potential expansion of existing invasive species populations from adjacent areas to the fire and potential areas of new population establishment following the fire. The field trips have been limited to observations along roads, lake shores, canals, dozer lines, staging areas and other areas of intense mechanical disturbances.

Summary of findings

Threats to Natural Resources by Non-native species

Refuge habitat types burned in the Evans Road Fire include Pocosin, Bay Forest, Atlantic white cedar Forest Habitat, Hardwood Swamp Forest, and Cypress/Gum Swamps. Invasive species of plants and animals known to occur on the refuge include: Phragmites (Phragmites australis), alligator weed (Alternanthera philoxeroides), Japanese Stiltgrass (Microstegium vimineaum), parrotfeather (Myriophyllum aquaticum), Sesbania (Sesbania exaltata), Japanese Honeysuckle (Lonicera japonica), Canada thistle (Cirsium arvense), Chinese privet, (Ligustrum sinense), fire ants (Solenopsis invicta), gypsy moth (Lymantria dispar), nutra (Mocastor coypus), European starling (Sturnis vulgaris), hose sparrow (Passer domesticus), Coyote (Canis latrans) and feral hog (Sus scrofa) (FWS Draft CCP 2007). As stated in the draft CCP, one objective for the refuge is to improve plant communities and limit impacts to refuge resources by monitoring, controlling, or eradicating pest plants as necessary. One strategy to achieve this objective is to monitor selected pest plants on a systematic basis, and implement early detection and rapid response pest plan control measures with refuge staff, contractors, and cooperating agencies and organizations.

Infestations of Phragmites (*Phragmites australis*), alligator weed (*Alternanthera philoxeroides*) and Japanese Stiltgrass (*Microstegium vimineaum*) are known to occur in established populations on and adjacent to the refuge boundary and fire perimeter. There is an aggressive invasive species removal program on the refuge which includes chemical (aerial and ground application herbicide) and mechanical (hand-pulling) treatments that have successfully removed invasive species from the refuge. On an annual basis, any existing populations are GPS'ed, and treated accordingly.

Critical areas that could lead to further encroachment of invasive species and threaten natural resources include hardwood forest and pocosin habitats, lakeshore habitat along New Lake and areas of roadsides,

ditches, canals, staging areas, dozer lines and other mechanically disturbed sites that threaten native habitat. Of particular interest are threats to natural resource habitats and uninvested areas within the fire perimeter. All newly established populations should be removed immediately once detected.

Rehabilitation Recommendations

- The establishment of invasive weeds within the burn area on the refuge should be monitored and treated as soon as detected within the refuge to prevent any further threat to native habitats within the refuge, particularly in the hardwood forest and pocosin habitats.
- At a minimum, annual assessments should be conducted with immediate chemical or mechanical control treatments employed to reduce expansion of known newly established populations on the refuge. Control of invasive species will prevent spread of non-invasive species into fragile or critical habitats of T&E species on burned lands within the refuge.
- Monitoring of invasive species patches along refuge roads should be conducted monthly from March thru September. Patches should be mapped with GPS and monitored to assess size of encroachments and effectiveness of treatments. Areas inaccessible from the ground (e.g., interior of refuge and around perimeter of Pungo Lake and New Lakes) should be monitored aerially during the summer months (June-July).
- Aerially observed sites should be mapped with GPS and treated via crop duster or helicopter if needed.
- Multiple treatments and monitoring up to five years following will be required with a variety of control techniques. The refuge is committed to conducting the needed monitoring and treatments beyond the three year limitations of the rehabilitation support available.
- Any ground, or aerial application, or combination of both treatments should be conducted in accordance with the label instructions of FWS approved chemicals including but not limited to glyphosate(AquaStar, Rodeo, AquaNeat), imazapyr (habitat) is required. These chemicals have been shown to be effective treatments in management of Phragmites, alligator weed, and Microstegium at Pocosin Lakes Refuge as part of the refuge's integrated pest management program. Timing of application may need to be adjusted to ensure treatment of each species is conducted in the proper phonological stage to ensure the protection and recovery of native and endemic species.
- Mechanical treatments (hand pulling and removal) will be implemented to manage Phragmites and Microstegium.
- Prescribed Fire may also be implemented to control Microstegium.

2. Wildlife Assessment Report

Wildlife Assessment Report – Evans Road Wildfire
Pocosin Lakes NWR
Wendy Stanton, Refuge Biologist
August 2008

Assessement Approach

The post-fire assessment was conducted by vehicle observations and on-site visits in July 2008 throughout the refuge where potential threats to wildlife may exist. Remote sites were visually assessed

via aerial reconnaissance trips.

Specifically, known locations of red-cockaded woodpecker sites were determined to be outside of the fire perimeter. Consultations were made with the Red Wolf biologist to determine potential threats to wolf habitat. Known wood duck box locations were re-visited following the fire. Hardwood habitat important to wildlife species was assessed during the forestry assessments (see Forestry Assessment Report below).

Threats to Refuge Resources

Refuge habitat types burned in the Evans Road Fire include Pocosin, Bay Forest, Atlantic white cedar Forest Habitat, Hardwood Swamp Forest, and Cypress/Gum Swamps. Key wildlife species habitat potentially impacted in the burned area includes; endangered red wolf, endangered Red-cockaded woodpecker, black bear, brown-headed nuthatch, red-headed woodpecker, American bobwhite quail, Chuck-will's-widow, American woodcock, neotropical migratory birds, canebrake rattlesnake, green treefrog, Swainson's warbler, Prothonotary Warbler, Black-throated green warbler, yellow-throated warbler, wood duck, American Black Duck, white-tailed deer, and American alligator (FWS draft CCP 2007). Of the list above, impacts to the endangered red wolf, and wood duck populations are of most concern to the refuge following the wildfire. At this time, the endangered red-cockaded woodpecker population on the refuge does not seem to be impacted by the wildfire

Wood Ducks - One of the waterfowl management programs at Pocosin Lakes NWR is to provide breeding habitat for wood ducks, a nationally recognized declining waterfowl species due to habitat loss. According to the draft CCP, an active program of maintaining 150 wood duck boxes in appropriate wood duck habitat on the refuge is a continuing waterfowl management objective for the refuge. Prior to the fire, the wood duck box program was in its infancy on the east side of the refuge where the fire occurred. Wood duck boxes were set up to supplement the available natural nest cavity habitat. The wood duck boxes were maintained annually by volunteers. Following fire however, most natural cavity nest habitat and wood duck boxes were destroyed. Wood duck boxes will need to be re-established within the fire perimeter to stabilize the existing population.

Findings

Wood Duck Nest Boxes- Most of the natural habitat for wood duck nests have been destroyed by the fire. At the time of the fire, at least 40 wood duck boxes were established and maintained within the fire perimeter. These boxes will need to be replaced.

Recommendations

Wood Duck Nest Boxes

- Nest boxes need to be re-visited within one year of the fire and those deemed unsalvageable should be replaced with new boxes. Locations of all nest boxes should be identified using a GPS.
- Nest boxes should be placed along canals and open water up to one-half mile spacings or beyond visibility of other nest boxes to avoid dump nesting.
- Wood duck nest boxes should be constructed with insect-resistant wood such as cypress or cedar.
- Boxes should be placed 6 to 8 feet above ground surface on stainless steel pipe.

- Predator guards should be made from tin and placed below each box.
- Two inches of cedar savings should be placed inside the next box for nesting material.
- Once installed, wood duck nest boxes will be maintained on an annual basis and surveyed for productivity on a monthly basis between March and August.

3. Forestry and Hydrology Report

Forest Habitat, Soils, and Hydrology Assessment Report – Evans Road Wildfire
Pocosin Lakes NWR

Dr. Eric L. Hinesley (Professor, North Carolina State University) and Mike Wicker (USFWS)
August 19, 2008

Assessement Approach

The post-fire field assessment was conducted August 13, 2008. In attendance were Eric Hinesley (Professor, Horticultural Science, NC State University), Mike Wicker (NC Coastal Coordinator, Ecological Services), Sue Wilder (Southeast Region Fire Ecologist), Kendall Smith (Partners Program, Refuges) and Wendy Stanton (Biologist, Pocosin Lakes NWR). The observed area was bounded by Evans Rd (west), Western Rd (East), and traversed by Harvester Rd (east-west).

Findings

Vegetative cover has been destroyed on most of the 42,000-acre burned area. The soil across this area is peat (primary soil series Pungo; peat ≥ 60 inches). This site is of particular interest because the Atlantic white cedar ecosystem is categorized as globally threatened by The Nature Conservancy and because the area is vitally important as a water filter for the Albemarle Pamlico Estuary. Mature Atlantic white cedar bogs provide a unique habitat that has naturally acidic waters and is cooler than surrounding hardwood swamps or pinelands. Cedar bogs support high breeding bird densities (425 to 554 pairs per 100 acres or 40 ha) of species such as ovenbirds (*Seiurus aurocapillus*), yellowthroats (*Geothlypus trichas*), and prairie, prothonotary. and hooded warblers (*Dendroica discolor, Protonotaria citrea, and Wilsonia citurna*, respectively). Hessel's hairstreak (*Mitouri hesseli*), a butterfly, uses Atlantic white cedar exclusively. Black bear (*Ursus americanus*), river otter (*Lutra canadensis*), and bobcat (*Felis rufus*) are numerous in cedar bogs, as are the State-listed eastern diamond-back rattlesnake (*Crotalus adamanteus*). The federally-listed red-cockaded woodpecker (*Picoides borealis*) inhabits mature pond pines that are scattered around cedar bogs.

Two projects really affected the impact of the Evans Road Fire. Without them, the block of pocosin west of Evans Road would have likely been a part of this fire and the homes on Shore Drive (south side of Phelps Lake) would have been at extreme risk. The first project was the Evans Road Fire Break. The second was a hydrology restoration project - an area of the refuge where the draining had been greatly reduced in an effort to restore natural water levels. Prior to the Evans Road Fire, a partnership between the NC Department of Environment and Natural Resources (NCDENR) and the U.S. Fish and Wildlife

Service restored 7,500 acres of previously drained pocosin wetlands at Pocosin Lakes NWR. Although the wetland restoration was primarily to minimize the impacts of local nutrient pollution and improve water quality and wildlife habitat, it also helped to greatly reduce the potential for wildfires like the Evans Road fire. Saturation of the soils limits the potential for peat ground fires to spread while still allowing the above-ground vegetation to burn (a necessary component of pocosin ecosystems).

Pocosins are unique wetlands, also known as southeastern shrub bogs. They are characterized by a very dense growth of mostly broadleaf evergreen shrubs with scattered pond pine. The thick layer of peat soils underlying pocosins act as nutrient sponges over thousands of years, locking-up nutrients, carbon, and other pollutants in vegetation and the ever- deepening soil layer. When pocosins southeast of Lake Phelps were drained for farming and peat mining (which is no longer being done in this area), their nutrient retention functions were lost and some of the nutrients they held were released to adjacent waters. In addition, drainage makes pocosins drier which increases the frequency and severity of wildfires. Drying lowers the water table, and increases oxidation of the peat, which causes the surface to subside over time.

When these lands became part of Pocosin Lakes NWR in 1990, managers began restoring natural water levels. The NCDENR partnership has accelerated the ongoing restoration efforts. Concern about nutrient pollution prompted staff at Pocosin Lakes and Alligator River NWR along with NCDENR to restore natural water levels on previously drained pocosins to offset the excess nitrogen by re-establishing the pocosin's function as a natural nutrient sponge. The restoration reduces the potential for water quality degradation where nutrient enrichment is already a problem and at the same time enhances habitat for wildlife by saturating these lands again.

The project involved elevating more than seven miles of roads at Pocosin Lakes NWR. Raised roads act as levees to help re-flood the historically drained peatlands, and also allow better access to fight fires when they occur. Water control structures are then used to help maintain optimum water levels. When complete, 7,500 acres will have been restored through cooperative funding and technical assistance from NCDENR and the Service's Divisions of Refuges and Ecological Services (Coastal and Environmental Contaminants Programs). These restored pocosins will retain about 1.5 million pounds of nitrogen and 48 million pounds of carbon each year which will help water quality in the Pungo River and the Pamlico Sound.

The current project, although providing substantial environmental benefits, addresses only the most severely altered lands on the refuge. Over 15,000 additional acres on the refuge are targeted for similar efforts (including portions east of Evans Road where wildfire suppression efforts are currently underway). By managing the water levels to allow peat soils to remain wet, peat ground fire danger has been reduced on portions of the refuge where the restoration is complete. Future restoration activities planned by Refuge Managers will continue to minimize fire threats.

The Albemarle Pamlico system, the second largest estuary in the country, is experiencing anoxia (an absence of aquatic oxygen) and blooms of the toxic dinoflagellate Pfiesteria piscida, both of which are the result of poor water quality. Historically, the fringe marshes, creeks, and beds of submerged aquatic vegetation in the Albemarle Pamlico Estuary have provided essential nursery habitat for most commercial and recreational fish and shellfish in the North Carolina coastal area. The estuary also provides important habitat for anadromous fish, including the endangered shortnose sturgeon (Acipenser

brevirostrum). All of these habitats depend on maintaining adequate water quality.

In the 1980s, the Atlantic white cedar bog was owned by a commercial operation that proposed to mine peat and construct a large peat-to-methanol synthetic fuel plant. The proposal was later abandoned, but the area had already been cleared, ditched, and drained. The site became part of the Pocosin Lakes NWR in 1990. Although the transfer of property to Federal ownership ended the threat of peat mining in the area, the site remained devoid of a natural community of plants and animals, and the water that drained from the site exceeded North Carolina water quality standards for mercury. Also, the nitrogen in the runoff was likely contributing to eutrophication (excess algal growth) downstream.

Peat in the project site and surrounding area (the old East Dismal Swamp) formed over the last 9,000 years since the Wisconsin period of glaciation. Vegetation deposited organic material faster than it could decompose and a thick layer of peat developed slowly over thousands of years. The peat retained the nitrogen that had been stored by growing plants and eventually created a very large bank of nitrogen. The peat also absorbed mercury from the rain water, similar to the way an activated charcoal filter cleans water by accumulating contaminants. Historically, mercury was present in the atmosphere at low levels from volcanic activity, and mercury has increased recently as a consequence of human activities (e.g., combustion of fossil fuels, smelting). <u>From the standpoint of soil development, a severe fire such as the Evans Road Fire, sets the clock back by a long time, say 1000 years or more.</u>

When peat bogs are ditched, the water table is lowered and the peat is aerated, which increases microbial activity and accelerates decomposition and nutrient release. Net accumulation of organic material is essential for a peat bog to perform its beneficial water quality role. If ditched bogs are allowed to decompose, or burn too deeply and too frequently, they can release excess nutrient loads into coastal rivers and estuaries on par with the largest point source (e.g., industrial site) discharges. Wetlands with deep organic soils can be either very good or very bad for surface water quality, depending on their condition.

Ecologically, AWC (*Chamaecyparis thyoides*) is an important species in the wetland forests of eastern NC and Virginia. Historically, the largest assemblage of AWC was in the Great Dismal Swamp (NC/VA). Woody residue imbedded in the peat indicates that AWC and baldcypress forests grew in these areas at one time (exact age unknown). Long ago, AWC was the most valuable forest tree species in the eastern coastal swamps. Today, the existing AWC is only a small fraction of that which existed 100 years ago, and the amount on the Refuge, excluding plantings, is very small. In most of the Albemarle peninsula, it was wiped out by a combination of exploitive logging, wildfire, and drainage for agriculture. AWC is an early succession species that accumulates a seed bank in the surface layer of peat, and can regenerate following catastrophic events (fire or blow-down from a hurricane). <u>Severe wildfires eliminate the seed bank when the peat is consumed.</u> <u>As a result, there is no remaining seed source to regenerate AWC. Then, restoration and regeneration requires artificial regeneration with seedlings.</u> Once established, the area occupied by AWC can expand through natural regeneration from seed dispersal. AWC does not tolerate long-term flooding, but is suited to sites where the water table is 4 to 12 inches below the soil surface during the growing season. It can grow on deep peat, typically underlain by sand.

Baldcypress (*Taxodium distichum*) is another important wetland tree species in eastern United States. It is valuable to wildlife for mast, den trees, roosting sites, cover, and nest sites. Cypress is more tolerant of long-term flooding than AWC, helping to account for its presence in riverine swamps. Compared to AWC, it tends to occur in wetter sites. Although found on a wide variety of sites, it is more nutrient demanding than AWC, and commonly grows in brown water swamps where there is sedimentation. However, it can grow in a wide variety of settings, including nutritionally sterile peat lands. If the water is moving, the effective nutrient status is greater compared to stagnant water, and the trees remove the nutrients from the passing water, reducing the nutrient loading moving downstream to estuaries. Cypress grows best where the peat is less than 40 inches deep, and the roots can reach mineral soil beneath the peat, especially if the subsoil is clay. The Evans Road Fire has consumed large amounts of peat, which will result in more surface water and less depth to subsoil, creating conditions favorable to baldcypress. Like AWC, baldcypress has no seed sources, and will require regeneration by seedlings to establish a local seed source.

Recommendations

1. Within 3 years, plant 700 acres of Atlantic white cedar (AWC). Source: North Carolina Forest Service (NCFS). Locate AWC in 10 acre blocks along roads throughout the burned area. Locate plantings on the side of the road opposite canals. Set plantings back 200 to 300 feet from the road to allow for future fire breaks, if needed. Having plantings close to roads facilitates establishment and greatly reduces logistical problems and expense associated with access, establishment, and maintenance.

2. Within 3 years plant 700 acres of bald cypress. Source: NCFS. Locate baldcypress on the canal side of roads, adjacent to canals.

3. Along Evans Road, plant cypress adjacent to the canal, and put AWC on the east side of the cypress. Do not plant trees on the west side of Evans Road (fire break).

4. Plant AWC and baldcypress at a density of 300 trees/acre (10 ft x 13 ft). Total trees equal 210,000 AWC and 210,000 baldcypress. AWC will be containerized 1-0 seedlings (1 year in nursery containers); baldcypress will be 1-0 bare-root seedlings (1 year in a seedbed). Use North Carolina seed sources. Plants will likely be available through the NCFS.

5. Do not replant pond pine. There is considerable pond pine in the burned area. It is highly resistant to fire, and although many were killed, a large portion did survive and will live and regenerate. Likewise, do not replant herbaceous or shrubby species because they will likely return on their own.

6. Use available information for peat depth, site elevation, direction and movement of water, and species site suitability, to determine what stretches of road will have trees planted beside them.

7. Use appropriate chemicals to prepare sites for planting or to release AWC and cypress after planting as required. Habitat (aquatic EPA label for imazypyr) is labeled for tree release in wetlands.

8. Continue ongoing efforts to restore seasonally flooded hydrology to areas of the refuge where it is not already accomplished. This will promote carbon and nitrogen sequestration through accretion of peat, improve the quality of water draining off the Refuge into the Albemarle-Pamlico Estuary, and lengthen the fire cycle to favor AWC and bald cypress.

4. Burn Severity Report

Evans Road Wildfire
Post-Fire Burn Severity Assessment Report
Sue Wilder, Regional Fire Ecologist, Southeast Region, USFWS
Dave Brownlie, Regional Fire Ecologist, Southeast Region, USFWS
August 2008

Assessment Approach

An immediate post-burn severity map was acquired based on USGS Burn Severity Mapping Protocols (http://burnseverity.cr.usgs.gov/) for the Evans Road Fire. The initial cost of this map was shared by the Evans Road Fire and the South1 fire of the Great Dismal Swamp NWR. Upon obtaining the base GIS layers from USGS for this map, a field site verification was determined based on observations collected during a field visit August 11-16th.

Findings

In general, the burn severity map was a good indication of the range of burn severity across the fire. It clearly demonstrated areas of low, moderate and high burn severity ranges. However, within high burn severity mapped areas there were significant amounts of peat depth loss which the map did not document well. There seems to be a gradient of soil impacts that have not been captured by the burn severity map that need further refinement in order to determine priority sites for rehab treatments. A series of field plots are needed to verify the map to adjust for the soil losses and further refine the map.

Recommendations

- Verify burn severity map by establishing field plots and ground truthing map based on field data collection. A good transect through the burn unit and representation of levels of burn severity could be obtained by running a transect west to east along Harvester Road for sampling plots.
- Acquire a one-year post-burn assessment map to verify long term burn severity impacts.
- Seek additional map products that will provide the needed resolution of peat depth loss for prioritizing rehab treatments (especially forest species plantings, and invasive species establishments).

APPENDIX II - ENVIRONMENTAL COMPLIANCE

Federal, State, and Private Lands Environmental Compliance Responsibilities

All projects proposed in the Evans Road Burned Area Rehabilitation Plan that are prescribed, funded, or implemented by Federal agencies on Federal, State, or private lands are subject to compliance with the National Environmental Policy Act (NEPA) in accordance with the guidelines provided by the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508); Department of the Interior and the U.S. Fish & Wildlife Service. This Appendix documents the Burned area emergency response team considerations of NEPA compliance requirements for prescribed rehabilitation and monitoring actions described in this plan for all jurisdictions affected by the Evans Road Fire.

Related Plans and Cumulative Impact Analysis
Evans Road Burned Area Rehabilitation Plan *(September 2008)*. The Evans Road Fire Burned Area Rehabilitation Plan was reviewed and it was determined that actions proposed in the Fire Burned Area Rehabilitation Plan within the boundary of the Evans Road Fire are consistent with the management objectives established in the Pocosin Lakes NWR Comprehensive Conservation Plan. The Comprehensive Conservation Plan was found to be consistent with the applicable provisions of the State's coastal management program and the Division of Coastal Management concurred with this determination on October 1, 2007. The Comprehensive Conservation Plan NEPA compliance process specifically addresses:

GOAL 2. Restore, protect, and enhance pocosin wetlands and other natural habitats for optimum biodiversity. Intensely manage habitats specific to waterfowl on the Pungo Unit.

Objective: Pocosin
Manage 61, 288 acres of pocosin, including forest, shrub, and herbaceous stages, to maintain it as a natural community. Depending on locations and timing of opportunities, convert 2,900 acres of herbaceous or shrub stage pocosin to Atlantic white cedar, hardwood swamp forests, moist soil-units and firebreaks.

***Strategies*:** Restore 700 acres of shrub or grass stage pocosin to Atlantic white cedar Forest
***Strategies*:** Restore 1,500 acres of shrub or grass stage pocosin to bottomland hardwood forest.

Objective: Peatland Atlantic white cedar Forest
Manage 3,824 acres (3,124 existing acres and 700 newly restored acres) of functional peatland Atlantic white cedar Forest habitat to maintain it as a natural community.

Strategies: Convert 700 acres of pocosin habitat in the shrub or grass stage to peatland Atlantic white cedar Forest.

Objective: Hardwood Swamp Forest
Manage 15, 545 acres (14,045 existing acres and 1,500 newly restored acres) of healthy, functional hardwood swamp forest habitat to maintain it as a natural community.

Strategies: Plant 1,500 acres of pocosin with shallow peat soil in the shrub or grass stage to hardwoods to maintain a healthy, functional hardwood swamp forest habitat community.

Objective: Cypress Gum Forest
Manage 970 acres of healthy, functional cypress/gum swamp habitat to maintain it as a natural community.

Objective: Natural Lake Shoreline
Manage 446 acres of healthy, functional natural lake shoreline habitat to maintain it as a natural community.

Strategies: Manage undesirable vegetation as necessary.

Objective: Roads, Roadsides, and Canals
Maintain 80 miles of road surface for public vehicular access, 27 miles for hunting season all-terrain vehicle access, and up to 143 miles on a 1-to3-year cycle for administrative, fire and non-vehicular public access. Maintain 250 miles of canals to maintain water management capability. Manage roads, roadsides and canals to optimize wildlife habitat.

Strategies: Raise the elevation of certain sections of roads as described in the hydrology restoration plan to facilitate hydrology restoration and provide continued access within fifiteen years.

Strategies: Maintain all roads open to the public to Federal Highway Administration Standards.

Strategies: Maintain 909 acres of canals according to the hydrology restoration plan.

Strategies: Implement early detection and rapid response to invasive species during the road rising process.

Objective: Wood Duck Next Boxes
Maintain up to 150 wood duck next boxes inappropriate wood duck habitat annually.

Objective: Firebreaks
Manage 1,750 acres of firebreaks on a 3-year rotation according to the fire management plan to facilitate wildfire suppression and also provide early successional habitat for wildlife.

Strategies: Manage vegetation in firebreaks by mechanical means, with herbicides and with prescribed burning.

Strategies: Maintain roads and canals as part of firebreak system.

Objective: Cultural Resources
Avoid all impacts to cultural resources by coordinating with the Regional Office

Strategies: Evaluate all proposed projects and coordinate with the Regional Office before beginning a project.

Strategies: Protect identified cultural resource sites.

Cumulative Impact Analysis

Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, both Federal and non-Federal. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. The rehabilitation treatments for areas affected by the Evans Road Fire, as proposed in the Evans Road Fire Burned Area Rehabilitation Plan, do not result in an intensity of impact (i.e. major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

Applicable and Relevant Categorical Exclusions

The individual actions proposed in this plan for Evans Road Fire are Categorically Excluded from further environmental analysis as provided for in section 516 DM Appendix 2 of the Departmental Manual. All applicable and relevant Department and Agency Categorical Exclusions are listed below. Categorical Exclusion decisions were made with consideration given to the results of required emergency consultations completed by the Burned area emergency response team and documented below.

Applicable Department Categorical Exclusions

- The operation, maintenance, and management of existing facilities and routine reoccurring management activities and improvements, including renovations and replacements which result in no or only minor changes in the use and have no negligible and environmental effects on-site or in the vicinity of the site.
- Fire management activities, including prevention and restoration measures, when conducted in accordance with departmental and Service procedures.
- Consultation and technical assistance activities directly related to the conservation of fish and wildlife resources.

Statement of Compliance for the Evans Road Fire Burned Area Rehabilitation Plan.

This section documents consideration given to the requirements of specific environmental laws in the development of the Evans Road Fire Burned Area Rehabilitation Plan. Specific consultations initiated or completed during development and implementation of this plan are also documented. The following executive orders and legislative acts have been reviewed as they apply to the Evans Road Fire Burned Area Rehabilitation Plan:

- National Historic Preservation Act (NAPA).
- Executive Order ll988. Flood plain Management.
- Executive Order 11990. Protection of Wetlands.
- Executive Order 12372. Intergovernmental Review.
- Executive Order 12892. Federal Actions to Address Environmental Justice in Minority and Low-income Populations.
- Endangered Species Act.
- Secretarial Order 3127. Federal Contaminated
- Clean Water Act.
- Clean Air Act.

CONSULTATIONS
Refuge Biologist, Pocosin Lakes NWR, Columbia, NC
Endangered Species Biologist, Ecological Services Office, Raleigh, NC
Refuge Manager, Pocosin Lakes NWR, Columbia, NC
Assistant Refuge Manager, Pocosin Lakes NWR, Columbia, NC
Regional Integrated Pest Management Coordinator, Southeast Region, Hatchie NWR, TN
Regional Fire Ecologist, Southeast Region, Lacombe, LA
Fire Management Officer, Pocosin Lakes NWR, Columbia, NC
District 1, Zone Fire Management Officer, Alligator River NWR

NEPA Checklist: If any of the following exception applies, the Burned Area Rehabilitation Plan cannot be Categorically Excluded and an Environmental Assessment (EA) is required.

(Yes) (No)
( ) (x) Adversely affect Public Health and Safety
( ) (x) Adversely affect historic or cultural resources, wilderness, wild and scenic rivers aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or Natural Landmarks.
( ) (x) Have highly controversial environmental effects.
( ) (x) Have highly uncertain environmental effects or involve unique or unknown environmental risks.
( ) (x) Establish a precedent resulting in significant environmental effects.
( ) (x) Relates to other actions with individually insignificant but cumulatively significant environmental effects.
( ) (x) Adversely effects properties listed or eligible for listing in the National Register of Historic Places
( ) (x) Adversely affect a species listed or proposed to be listed as Threatened or Endangered.

( ) (x) Threaten to violate any laws or requirements imposed for the "protection of the environment" such as Executive Order 11988 (Floodplain Management) or Executive Order 1 1990 (Protection of Wetlands).

National Historic Preservation Act
Ground Disturbance:

(X) None
( ) Ground disturbance did occur and an archeologist survey, required under section 110 of the NHPA will be prepared. A report will be prepared under contract as specified by the Burned Area Rehabilitation Plan.

A NHPA Clearance Form:

( ) Is required because the project may have affected a site that is eligible or on the national register. The clearance form is attached. SHPO has been consulted under Section 106 (see Cultural Resource Assessment, Appendix I).
(X) Is not required because the Burned Area Rehabilitation Plan has no potential to affect cultural resources (initial of cultural resource specialist).

Other Requirements

(Yes)	(No)	
( )	(X)	Does the Burned Area Rehabilitation Plan have potential to affect any Native American uses? If so, consultation with affiliated tribes is needed.
(X)	( )	Are any toxic chemicals, including pesticides or treated wood, proposed for use? If so, local agency integrated pest management specialists must be consulted. (The use of Arsenal on Refuge lands must be approved on a yearly basis by submission of pesticide use proposals (PUP) through the regional IPM coordinator.

I have reviewed the proposals in the Evans Road Fire Burned Area Rehabilitation Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effect. Therefore it is categorically excluded from further environmental (NEPA) review and documentation. Burned area emergency response team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environment review requirements.

Wendy D. Stanton 9-9-2008

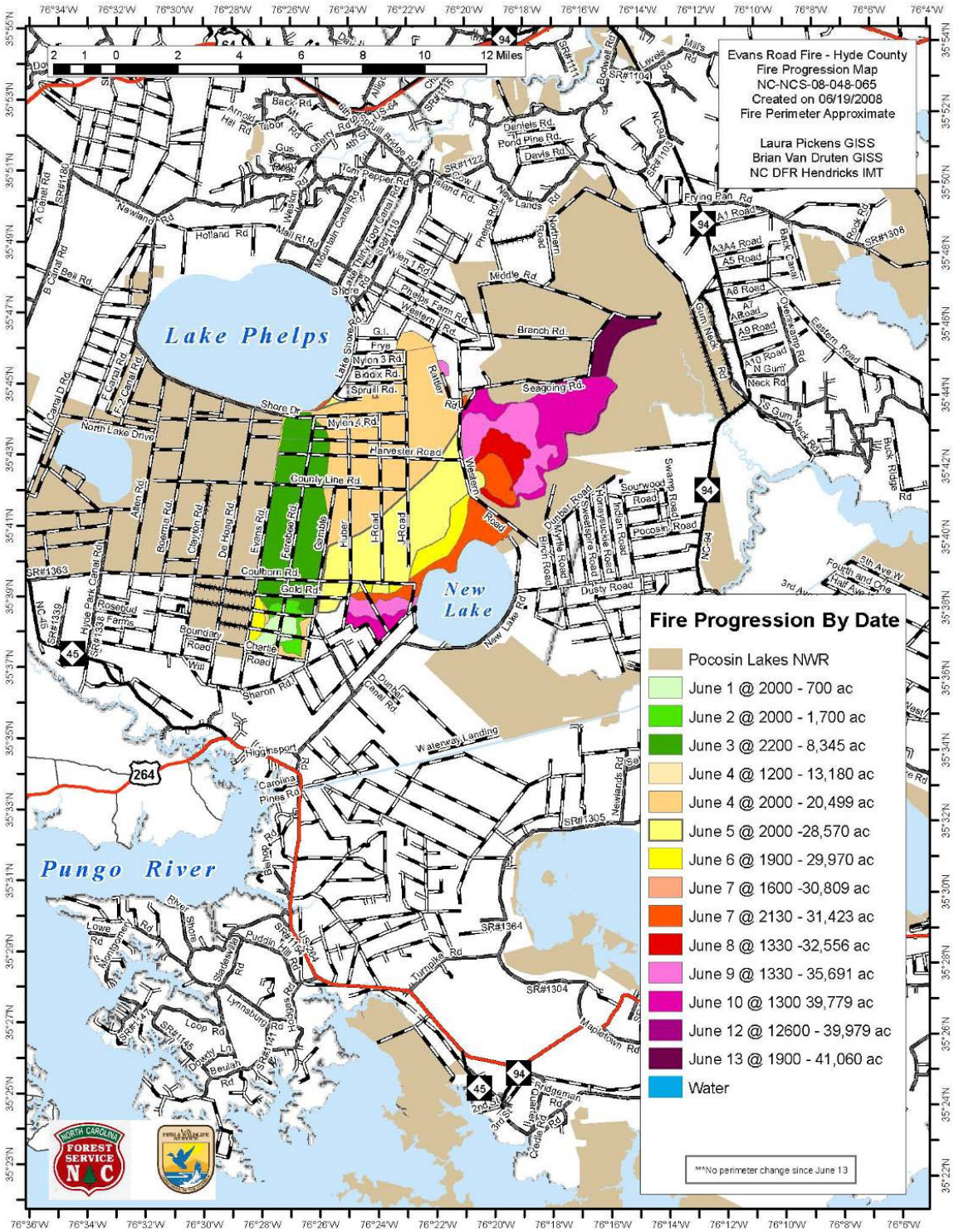
Wendy Stanton
Burned Area Emergency Response Team Environmental Specialist Date

Howard Phillips 9-9-2008

Howard Phillips
Project Leader, Pocosin Lakes National Wildlife Refuge Date

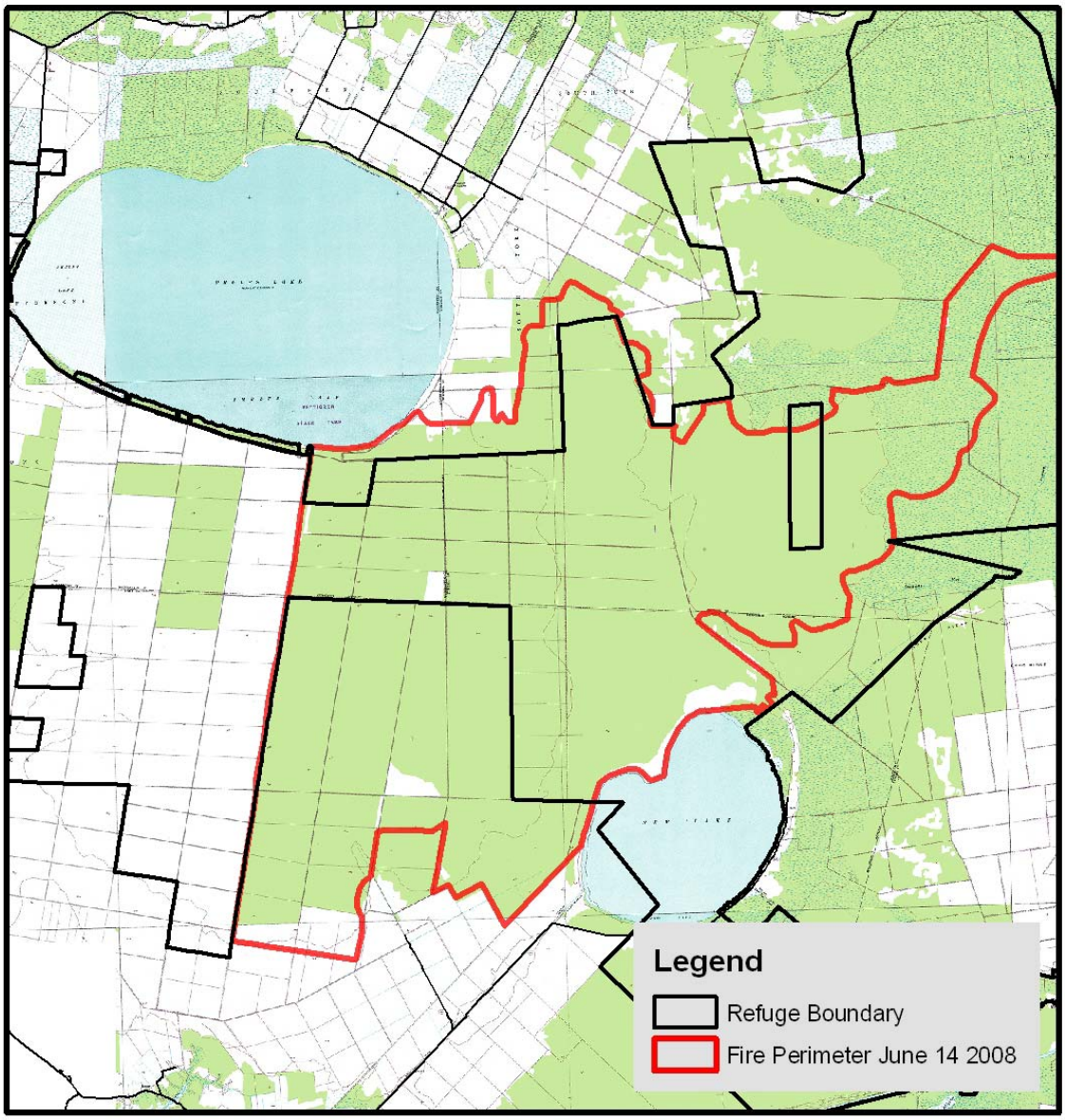
APPENDIX III - MAPS

Evans Road Fire Perimeter Progression Map



Evans Road Fire Refuge Boundary Map

Refuge Boundary within Fire Perimeter Map
Evans Road Fire
Aug 20, 2008



USFWS
Map Created August 19, 2008
Based on IMT Maps provided
SWilder
Southeast Region

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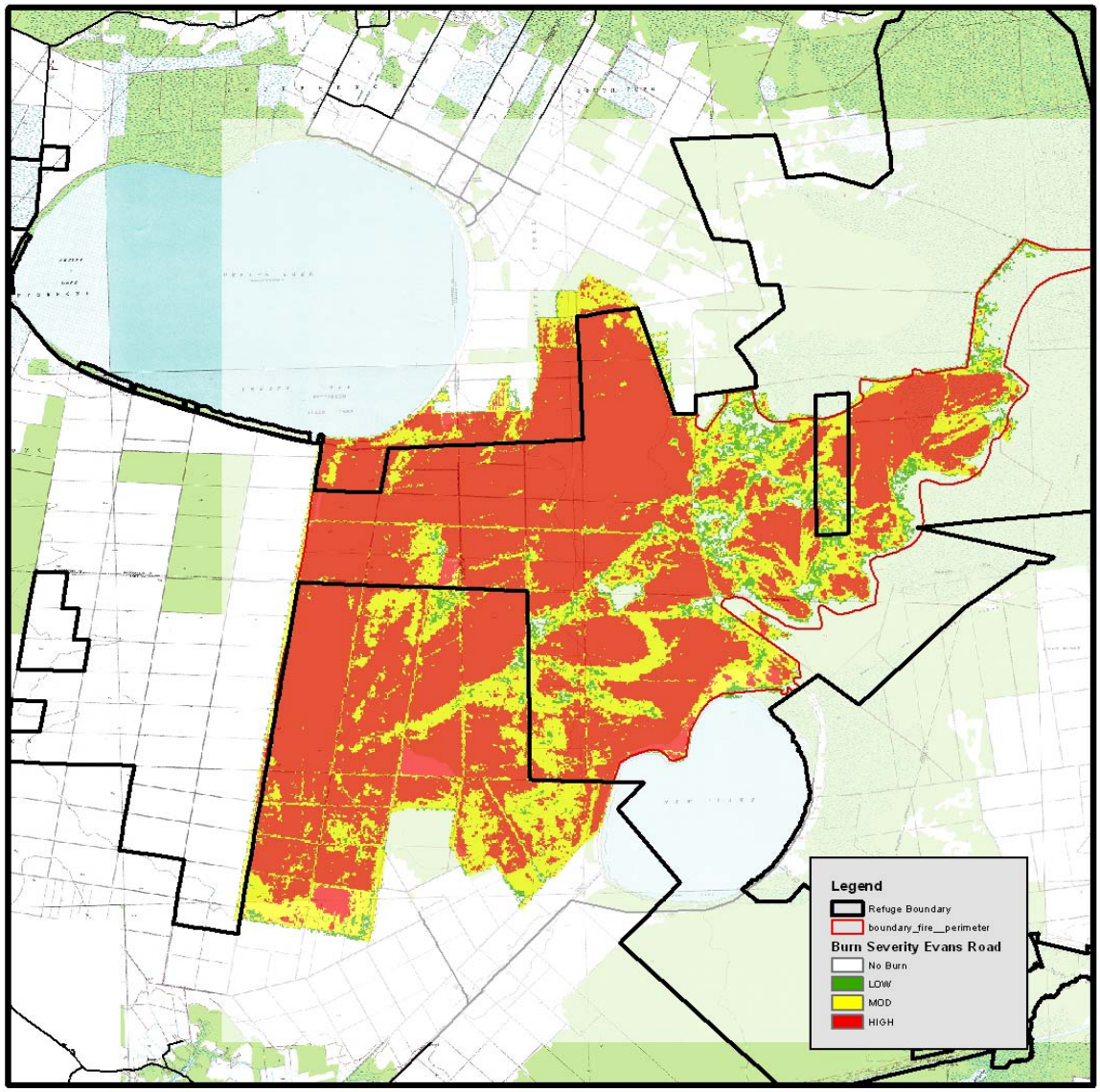
Evans Road Fire Burn Severity Map

Burn Severity Map
Evans Road Fire
Aug 20, 2008



USFWS
Map Created August 19, 2008
Based on IMT Maps provided
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Southeast Region

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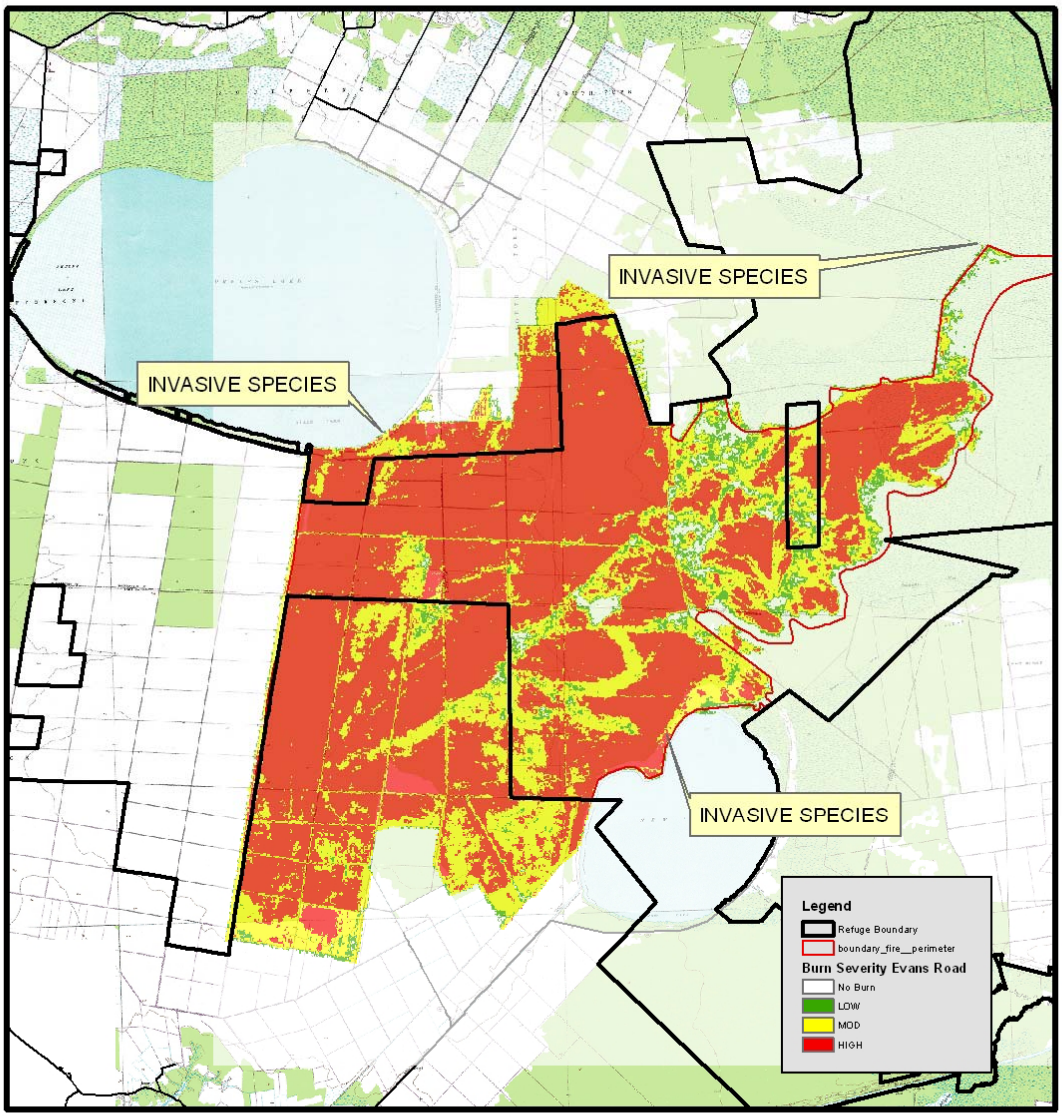
Evans Road Fire Rehab Map - Invasive species locations

Invasive Species Locations
Evans Road Fire
Aug 20, 2008



USFWS
Map Created August 19, 2008
Based on IMT Maps provided
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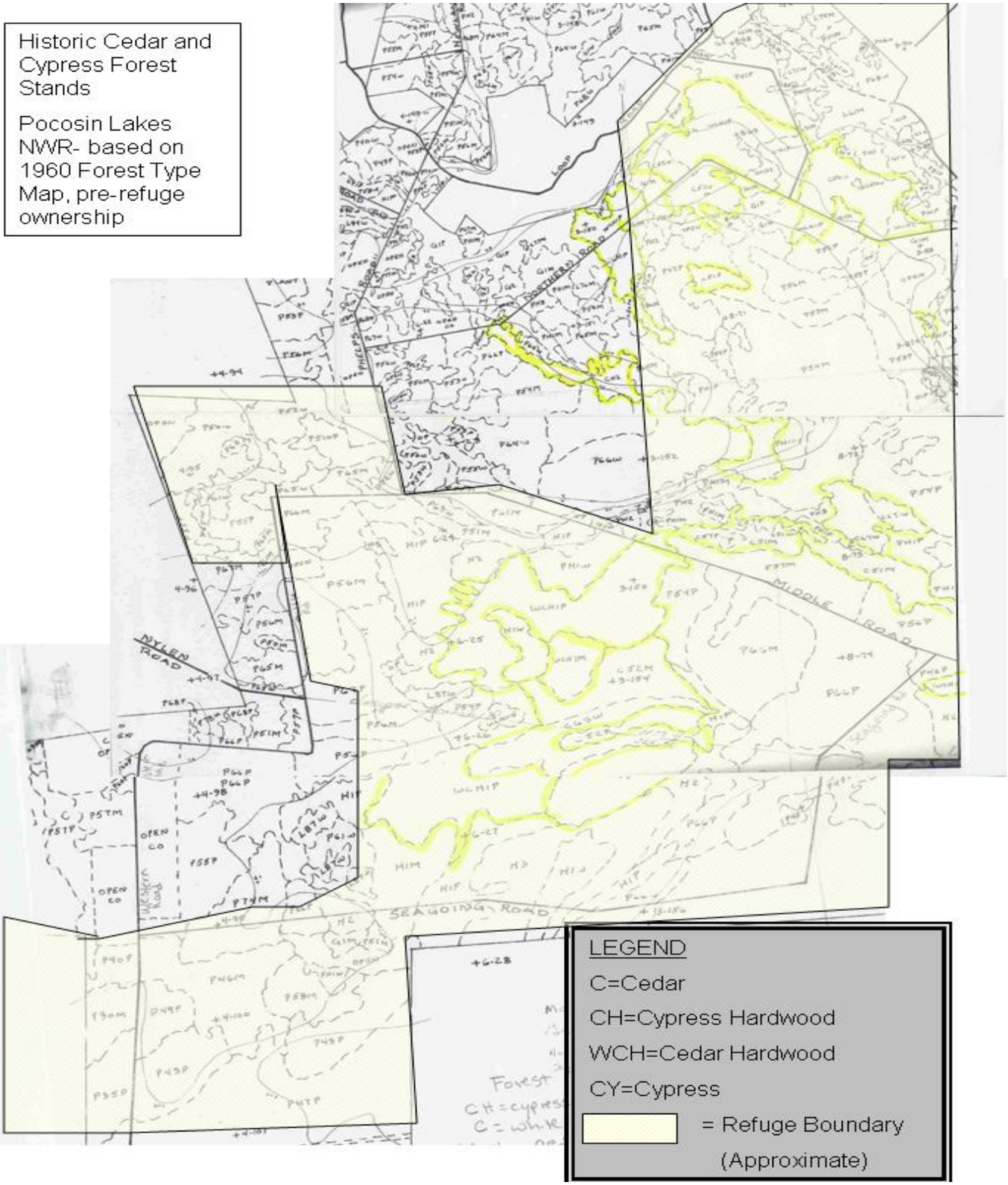
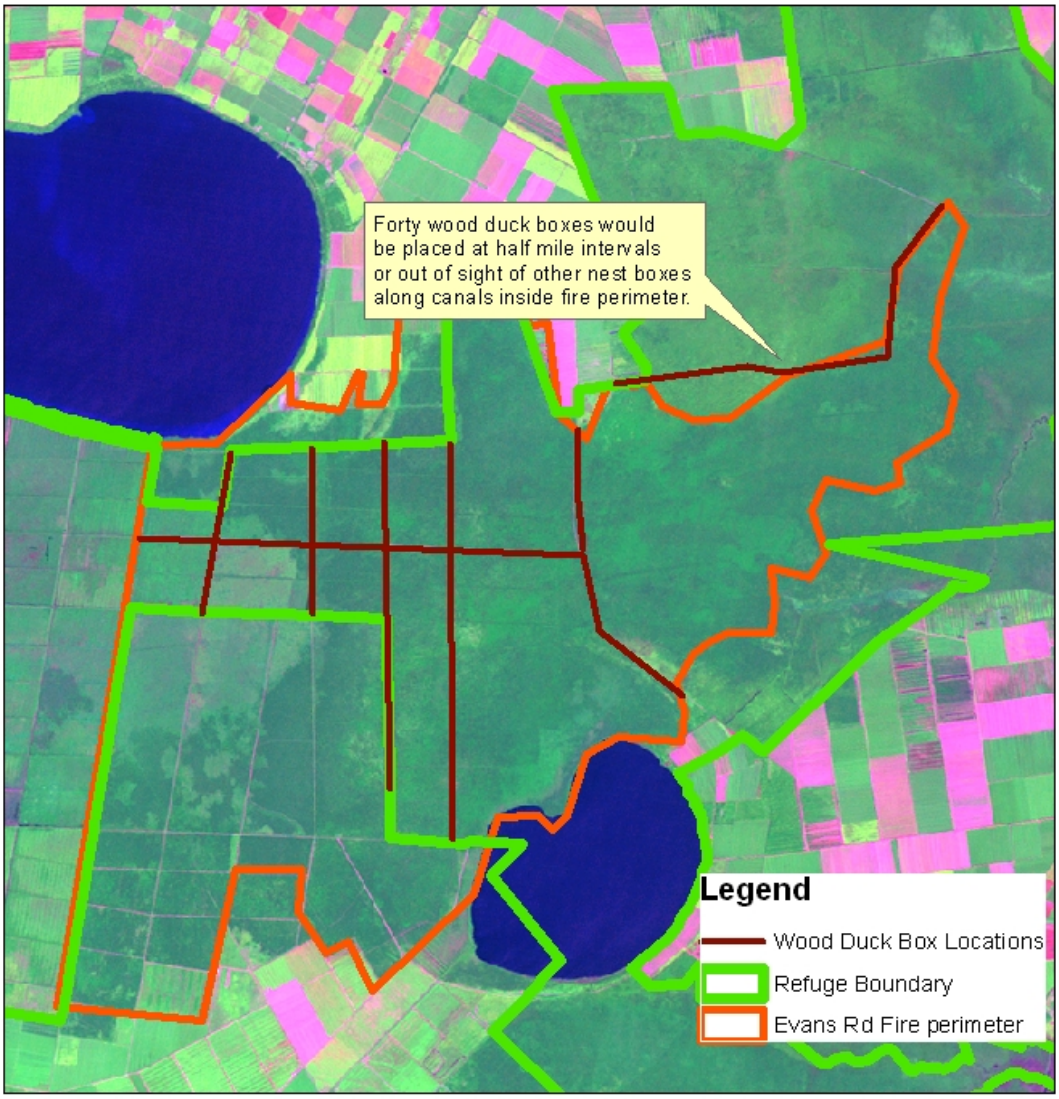
Evans Road Fire Rehab Map – Historic Cedar and Cypress Stands



Evans Road Fire Rehab Map – Wood Duck Nest Box map

Woodduck Nest Box Priority Site Map
Evan's Road Fire
September 4, 2008



USFWS
Map Created September 4, 2008
Wendy Stanton
Pocosin Lakes Refuge

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APPENDIX IV - PHOTO DOCUMENTATION

APPENDIX V – PESTICIDE USE PROPOSAL

The following two PUPs would be required to be submitted annually for approval in the US Fish and Wildlife Service Pesticide Use Proposal Database. For 2008, the Habitat and AquaNeat PUPs were approved for Pocosin Lakes Refuge lands in accordance to EPA label directions and modifications as directed in the approved PUPs.

Whit Lewis Regional IPM/Farming Coord. 9/11/2008

Whit Lewis, Regional Integrated Pest Management / Farming Coordinator Date

PUP Number: R4-08-42535-031

Treatment Site: POCOSIN LAKES NATIONAL WILDLIFE REFUGE

Product Tradename: Habitat

Region: 4 **Org Code:** 42535 **Year:** 2008

State/County: NC/HYDE, NC/TYRRELL, NC/WASHINGTON

Duty Station: POCOSIN LAKES NATIONAL WILDLIFE REFUGE

Management Unit(s): Moist soil units, canals, riparian areas, dikes, and other areas with encroaching alligator weed and Phragmites.

Map Attached: Yes

Status: Approved by WO with Modifications

Pesticide Use Pattern:

Need for Treatment: Invasive Species, Native Habitat Restoration, Habitat Improvement

Treatment Site: Terrestrial

Treatment Site Land Type: riparian, shrub, disturbed, grassland

Is the crop being treated a genetically modified organism(GMO) (Y/N): Y

Managment Action/Economic Threshold:

The invasive Phragmites, alligator weed and aggressive black willow out-compete the preferred native vegetation in the refuge's moist soil units. During Atlantic white cedar plantings, hardwood species can out-compete and stress cedar seedlings. In the refuge's moist soil unit, any presence of alligator weed or Phragmites would require immediate treatment. If black willow is greater than 50% cover, Habitat would be applied.

How does this pest(s) interfere with achieving habitat and/or wildlife management objectives?:

The invasive Phragmites, alligator weed and aggressive black willow out-compete the preferred native vegetation in the refuge's moist soil units. During Atlantic white cedar plantings, hardwood species can out-compete and stress cedar seedlings.

Target Pest(s): Alligator weed (Alternanthera philoxeroides)
Phragmites (Phragmites australis syn. Phragmites communis)
Willow (Salix spp.)

Pesticides:

Trade Name: Habitat

Common Name: imazapyr

U.S. EPA Registration Number: 241-426

Manufacturer: BASF Ag Products

Pesticide Details:

Restricted Use Pesticide (Y/N): N

Is the treatment site type listed on the label (Y/N): Y

Is pest listed on label: Y

If the crop, type of vegetation, or site type is not listed, is there a current Section 18 exemption under which you are proposing to operate (Y/N): N

If the crop, type of vegetation, or site type is not listed, is there a current Section 24c exemption under which you are proposing to operate (Y/N): N

Supplemental Label for Proposed Use (Y/N): N

Tank Mix (Y/N): Y

Adjuvants: Crop oil, nonionic surfactants

Other Ingredients: N/A

Number of Applications: 1

Application Period: March - August

Application(s):

Trade Name	Rate	Method	Equipment
Habitat	6 pints/acre	broadcast	Helicopter

Size of Treatment Area: 100 acres

REI (Restricted Entry Interval): 12 Hour

Applicator Information: Contractor, FWS

Name of FWS Lead Certified Pesticide Applicator: Wendy Stanton

Best Management Practices:

Application at wind speeds less than 10 mph (but not inversion conditions) - must follow label.

Calibrate application equipment.

Field scouting/monitoring before pesticide application.

Pesticide application buffers around sensitive areas.

Use lowest effective application rate.

During windy conditions, areas are not sprayed. Applicators abide by all label requirements.

Approved IPM Plan (Y/N): N

Non-Chemical Controls Considered (Y/N): N

Treatment Site Conditions:

Topography (Degree Slope):

Soil Texture: Peat/Muck, Sandy Loam

Soil pH: <7

Soil Organic Matter: 85% (Pungo Muck as per Soil Survey Maps & Interpretation for Washington County)

Surface Water Type(s): River, Wetland, Lake, Canal, Shoreline Lake, Shoreline River

Distance to nearest: 151 - 300 ft

Depth to Groundwater: Unknown

Distance to nearest potable water: Not Applicable

Is the Treated Are Naturally Flooded or Irrigated (Y/N): N

Irrigation Method: N/A

Non-Target Species near or within Treatment Area (taxonomic groups):

Amphibians, Native Pollinating Insects, Reptiles

Are impacts to non-targets expected (Y/N): N

FWS Candidate and Federally Listed Species:

Common Name	Effects	Comments
Bald Eagle	NLAA	
Red Wolf	NLAA	

Are there any other Federally Listed, Proposed, or Candidate Species that occur (or may occur) at or near the Site that are not listed above (Y/N): Y

Other Federally Listed, Proposed, or Candidate Species:

Common Name: Red-cockaded Woodpecker

Scientific Name: Picoides borealis

Effects: NLAA

Comments:

Common Name: Sensitive Joint Vetch

Scientific Name: Aeschynomene virginica

Effects: NLAA

Comments:

Are there any State Listed, Proposed, or Candidate Species or their habitats, or other species of concern that may be affected by the proposed activity (Y/N): Y

Other Species of Concern:

Submitter Comments:

Although not documented, sensitive-joint vetch could occur on the refuge.

Contact Person: Wendy Stanton

Phone: 252-796-3004

Fax: 252-796-3010

Project Leader: David Kitts
Phone: 252/796-3004 X224

Reviewer Information:

Date: 02/11/2008
Reviewer: whit_lewis@fws.gov
Reviewer Type: Regional (Dis)Approver
Action Taken: Reviewed by RO (Dis)Approver and forwarded to WO
Comments: N/A

Date: 03/18/2008
Reviewer: tiffany_parson@fws.gov
Reviewer Type: National Dis(Approver)
Action Taken: Approved by WO with Modifications
Comments: Please use Arsenal as needed for terrestrial applications.

Approval Period: 1 year **Approval Expires:** 12/31/2008

PUP Number: R4-08-42535-013
Treatment Site: POCOSIN LAKES NATIONAL WILDLIFE REFUGE
Product Tradename: AquaNeat
Region: 4 **Org Code:** 42535 **Year:** 2008
State/County: NC/HYDE, NC/TYRRELL, NC/WASHINGTON
Duty Station: POCOSIN LAKES NATIONAL WILDLIFE REFUGE
Management Unit(s): N/A
Map Attached: Yes
Status: Approved by Field (Dis)Approver
Pesticide Use Pattern:

Need for Treatment: Invasive Species, Crop Pest, Native Habitat Restoration
Treatment Site: Aquatic & Wetlands
Managment Action/Economic Threshold:

The invasive Phragmites and aggressive black willow out-compete the preferred native vegetation in the refuge's moist soil units and the perimeter around Pungo Lake. Any presence of Phragmites in the moist soil units would be treated. If black willow is greater than 20% in the moist soil units it would be treated. Large Phragmites patches around Pungo Lake and other source points will continue to be treated with herbicide to restore native plants. Any evidence of alligator weed on the Pungo Unit would be treated with herbicide.

How does this pest(s) interfere with achieving habitat and/or wildlife management objectives?:

The site management goal for the refuge's moist soil units is to provide habitat for wintering migratory waterfowl. Phragmites, alligator weed and willow will encroach and outcompete the preferred native plant species around the lake and in the moist soil units.

Target Pest(s): Alligator weed (Alternanthera philoxeroides)
Phragmites (Phragmites australis syn. Phragmites communis)
Willow (Salix spp.)

Pesticides:

Trade Name: AquaNeat
Common Name: glyphosate
U.S. EPA Registration Number: 228-365
Manufacturer: Nufarm Americas, Inc.

Pesticide Details:

Restricted Use Pesticide (Y/N): N
Is the treatment site type listed on the label (Y/N): Y
Is pest listed on label: Y
If the crop, type of vegetation, or site type is not listed, is there a current Section 18 exemption under which you are proposing to operate (Y/N): N
If the crop, type of vegetation, or site type is not listed, is there a current Section 24c exemption under which you are proposing to operate (Y/N): N
Supplemental Label for Proposed Use (Y/N): N

Tank Mix (Y/N): Y
Adjuvants: LI-700 , non-ionic surfactant
Other Ingredients: N/A
Number of Applications: 2
Application Period: June - August
Application(s):

Trade Name	Rate	Method	Equipment
AquaNeat	6 pints/acre	broadcast	Fixed-wing Aircraft
AquaNeat	6 pints/acre	Aerial	Helicopter
AquaNeat	6 pints/acre	Broadcast	Hand broadcast

Size of Treatment Area: 100 acres
REI (Restricted Entry Interval): None

Applicator Information: Contractor, Cooperator, FWS
Name of FWS Lead Certified Pesticide Applicator: Wendy Stanton

Best Management Practices:

Application at wind speeds less than 10 mph (but not inversion conditions) - must follow label.
Calibrate application equipment.
Field scouting/monitoring before pesticide application.
Pesticide application buffers around sensitive areas.
Use lowest effective application rate.

Labels are closely followed when applying the herbicide to the management unit.
During windy conditions, the herbicide is not applied.

Approved IPM Plan (Y/N): N

Non-Chemical Controls Considered (Y/N): N

Treatment Site Conditions:

Topography (Degree Slope):
Soil Texture: Peat/Muck, Sandy Loam
Soil pH: <7
Soil Organic Matter: 85% (Pungo Muck as per Soil Survey Maps & Interpretation for Washington County)
Surface Water Type(s): River, Wetland, Lake, Canal, Shoreline Lake, Shoreline River
Distance to nearest: 151 - 300 ft
Depth to Groundwater: Unknown
Distance to nearest potable water: Not Applicable
Is the Treated Are Naturally Flooded or Irrigated (Y/N): N
Irrigation Method: N/A

Non-Target Species near or within Treatment Area (taxonomic groups):

Amphibians, Native Pollinating Insects, Reptiles

Are impacts to non-targets expected (Y/N): N

FWS Candidate and Federally Listed Species:

Common Name	Effects	Comments
Bald Eagle	NLAA	Concurred
Red Wolf	NLAA	Concurred

Are there any other Federally Listed, Proposed, or Candidate Species that occur (or may

occur) at or near the Site that are not listed above (Y/N): Y

Other Federally Listed, Proposed, or Candidate Species:

Common Name: Red-cockaded Woodpecker
Scientific Name: Picoides borealis
Effects: NLAA
Comments: Concurred

Are there any State Listed, Proposed, or Candidate Species or their habitats, or other species of concern that may be affected by the proposed activity (Y/N): N

Submitter Comments:

The invasive alligator weed is present in open water including canals, rivers, and ditches. It has not been observed in the refuge lakes at this time. Phragmites has been mapped on the refuge in impoundments, perimeter of lakes, canals, firebreaks and other disturbed areas.

Contact Person: Wendy Stanton
Phone: 252-796-3004 x224
Fax: 252-796-3010

Project Leader: Howard Phillips
Phone: 252/796-3004 x226
Fax: 252/796-6010

Reviewer Information:

Date: 02/13/2008
Reviewer: whit_lewis@fws.gov
Reviewer Type: Regional (Dis)Approver
Action Taken: Approved by RO (Dis)Approver
Comments: N/A

Date: 02/13/2008
Reviewer: david_kitts@fws.gov
Reviewer Type: Field (Dis)Approver
Action Taken: Approved by Field (Dis)Approver
Comments: N/A

Approval Period: 1 year **Approval Expires:** 12/31/2008

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

September 8, 2008

Memorandum

To: Refuge Manager, Pocosin Lakes National Wildlife Refuge, North Carolina

From: Field Supervisor, Ecological Services Office, Raleigh, NC

Subject: Intra-Service section 7 biological evaluation for Evans Road Fire Rehabilitation Plan

This follows review of your September 4, 2008 memorandum and Intra-Service Section 7 Biological Evaluation Form (BE Form) regarding implementation of the "Evans Road Fire Burned Area Rehabilitation Plan" (Plan) on Pocosin Lakes National Wildlife Refuge, Tyrrell, Hyde and Washington counties, North Carolina. Additionally you provided this office an electronic file of the draft Plan dated September 4, 2008. Per intra-service section 7 consultation guidelines, you have requested Field Office review of the Plan regarding the potential for its implementation to affect federally listed threatened and endangered species. Our comments are provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 *et seq.*) and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c).

Pocosin Lakes NWR is preparing a rehabilitation plan for the Evan's Road Wildfire. The Evan's Road Wildfire area extends from Evans road east to a point just north of Middle Road, south to New Lake and the southern boundary of the refuge. The Plan would include herbicide applications to prepare sites, as needed, for reforestation of Atlantic white cedar (*Chamaecyparis thyoides*) and bald cypress (*Taxodium distichum*), reduce hardwood competition in recently planted cedar stands at years two and three post-planting, and to manage invasive species which may begin to populate un-infested areas of the refuge that have been made available by the fire disturbance.

The BE Form stipulates that "**Only the USFWS-approved pesticides** would be used on the refuge." Herbicides to be used include impazapyr (Arsenal or Habitat) and/or glyphosate. These herbicides have previously been approved in accordance with the Pesticide Use Proposal process and through section 7 consultation with the Raleigh Field Office. The Plan includes restoration of 700 acres of Atlantic white cedar in 10-acre patches and 700 acres of bald cypress along burned canals and waterways over the next three years. The proposed restoration complies with the Refuges Comprehensive Conservation Plan.

The federally listed red wolf has been observed in the general areas where the herbicides would be applied. Red wolf denning takes place from March through July. To prevent potential effects on red wolf pup rearing, herbicide applications will be closely coordinated with Red Wolf

Recovery Program biologists. The use of pesticides will be delayed where necessary to avoid interference with the biological needs of the red wolf. All known red-cockaded woodpecker (*Picoides borealis*; RCW) clusters and potential foraging habitat occur on the Frying Pan Unit, located in the east side of the refuge. Pesticides will not be applied to areas containing potential foraging/nesting habitat for the RCW. The potential for the project to affect undetected woodpecker groups is considered insignificant.

The American alligator (*Alligator mississippiensis*) is found in aquatic/wetland habitat, particularly along the northwest fork of the Alligator River and Gum Neck areas. While suitable habitat for the American alligator is contained within the project area, the potential for direct effects is believed to be minor. The sensitive joint-vetch (*Aeschynomene virginica*) is known to occur along intertidal zones where plants are flooded twice daily. Although found in Hyde County, sensitive joint-vetch has not been documented in Tyrrell or Washington counties and has not been found on Pocosin Lakes National Wildlife Refuge.

Based on the information contained in your memorandum of September 4, 2008 and accompanying BE Form and draft planning document, we concur with your determination that implementation of the Evans Road Fire Burned Area Rehabilitation Plan on Pocosin Lakes National Wildlife Refuge is not likely to adversely affect the red wolf, RCW or any other federally listed species or species proposed for listing under the Act. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

If you have questions concerning this response please call John Hammond at (919) 856-4520, ext 28.

2008-I-0213

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pocosin Lakes National Wildlife Refuge
205 South Ludington Drive, P.O. Box 329
Columbia, NC 27925-0329
Phone: 252/796-3004

U.S. Fish and Wildlife Service
Raleigh Field Office
P.O. Box 33726
Raleigh, NC 27636-3726

September 4, 2008

Dear Pete Benjamin;

Enclosed is an Intra-Service Section 7 Biological Evaluation for the Evans Road Fire Burned Area Rehabilitation Plan on Pocosin Lakes NWR. When appropriate, this project would require some herbicide treatments with approved Pesticide Use Proposals to prepare sites for planting Atlantic white cedar , bald cypress and to manage potential increase in invasive species encroachments.

Please review and provide comments for concurrence with section 7 of the Endangered Species Act. If you have any questions, please contact David Kitts or Wendy Stanton at phone number above, extension 223 or 224, respectively. Thank you!

Sincerely,

Wendy D. Stanton

Wendy Stanton
Wildlife Biologist

SEP - 5 2008

REGION 4
INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

(Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.)

Originating Person: Wendy Stanton, Refuge Biologist

Telephone Number: (252)796-3004 ext. 224 **E-Mail:** Wendy_Stanton@fws.gov

Date: August 30, 2008

PROJECT NAME (Grant Title/Number): **Evans Road Fire Burned Area Rehabilitation Plan**

Service Program:

- ____Ecological Services
- ____Federal Aid
  - ____Clean Vessel Act
  - ____Coastal Wetlands
- ____Endangered Species Section 6
  - ____Partners for Fish and Wildlife
  - ____Sport Fish Restoration
  - ____Wildlife Restoration
- ____Fisheries
- _X_Refuges/Wildlife

II. State/Agency: USFWS

III. Station Name: Pocosin Lakes National Wildlife Refuge

IV. Description of Proposed Action (attach additional pages as needed):

The Pocosin Lakes NWR is preparing a rehabilitation plan for the Evan's Road Wildfire. The Evan's Road Wildfire extends from Evans road east to just north of Middle Road, south to New Lake and southern boundary of the refuge. The proposed action would require herbicide treatments to prepare sites, when necessary, for Atlantic white cedar and baldcypress plantings, reduce hardwood competition in planted cedar stands at years two and three post-planting and to manage invasive species which may encroach previously uninfested areas of the refuge due to the fire disturbance. Proposed herbicides would include Arsenal or Habitat and/or glyphosate. These herbicides have previously been approved in accordance to the Pesticide Use Proposal process and Section 7 consultations. Over the next three years, the rehabilitation plan would include restoring 700 acres of Atlantic white cedar in 10 acre patches and 700 acres of bald cypress along burned canals and waterways, as in accordance to the refuge's Comprehensive Conservation Plan.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map: Please see attached map.

Complete the following table:

SPECIES/CRITICAL HABITAT	STATUS [1]
Red wolf (*Canis rufus*)	E
Southern bald eagle (*Haliaeetus leucocephalus*)	De-listed
Red-cockaded woodpecker (*Picoides borealis*)	E
American alligator (*alligator mississippiensis*)	TSA
Sensitive joint vetch (*Aeschynomene virginica*)	T

[1]STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location (attach map):

A. Ecoregion Number and Name: Southeast Region, Area II - Roanoke/Tar/Neuse/Cape Fear Ecosystem

B. **County and State:** Tyrrell, Washington, and Hyde Counties, North Carolina

C. Section, township and range (or latitude and longitude): 76°35'00", 36° 43'00"

D. Distance (miles) and direction to nearest town: Refuge office is located in Columbia, North Carolina.

E. Species/habitat occurrence: Historically, red wolves have been observed in the general areas where the herbicide treatments would be applied. **Only the USFWS-approved pesticides** would be used on the refuge. The red wolf denning season occurs from March through July. To prevent potential effects on red wolf denning, the herbicide applications will be closely coordinated with the red wolf biologists. If the red wolf biologists determine that the project will interfere with the wolves, the project will be postponed. All known RCW cavities and potential foraging habitat are located primarily on the east side of the refuge in the Frying Pan Unit. Potential American alligator habitat is located along the Northwest Fork of the Alligator River and Gum Neck areas. As of this time, sensitive joint vetch has not been documented on the refuge. These herbicide treatments with the coordination of the red wolf program, will not likely adversely affect endangered species or critical habitat.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item V. (attach

additional pages as needed)

SPECIES/CRITICAL HABITAT	IMPACT TO SPECIES/CRITICAL HABITAT
Red wolf (*Canis rufus*)	Not likely to adversely affect species or critical habitat.
Red-cockaded woodpecker (*Picoides borealis*)	Not likely to adversely affect species or critical habitat.
American alligator (*alligator mississippiensis*)	Not likely to adversely affect species or critical habitat.
Sensitive joint vetch (*Aeschynomene virginica*)	Not likely to adversely affect species or critical habitat.

B. Explanation of actions to be implemented to reduce adverse effects:

SPECIES/CRITICAL HABITAT	Actions to mitigate/minimize impacts
Red wolf (*Canis rufus*)	Denning season occurs from March through July. To prevent impacts, proposed work would be coordinated closely with the red wolf program.
Red-cockaded woodpecker (*Picoides borealis*)	Work will be conducted in pre-determined boundaries.
American alligator (*alligator mississippiensis*)	Work will be conducted in pre-determined boundaries.
Sensitive joint vetch (*Aeschynomene virginica*)	work will be conducted in pre-determined boundaries.

Effect Determination and Response Requested:

SPECIES/CRITICAL HABITAT	Determination [1]			Response
	NE	NA	AA	

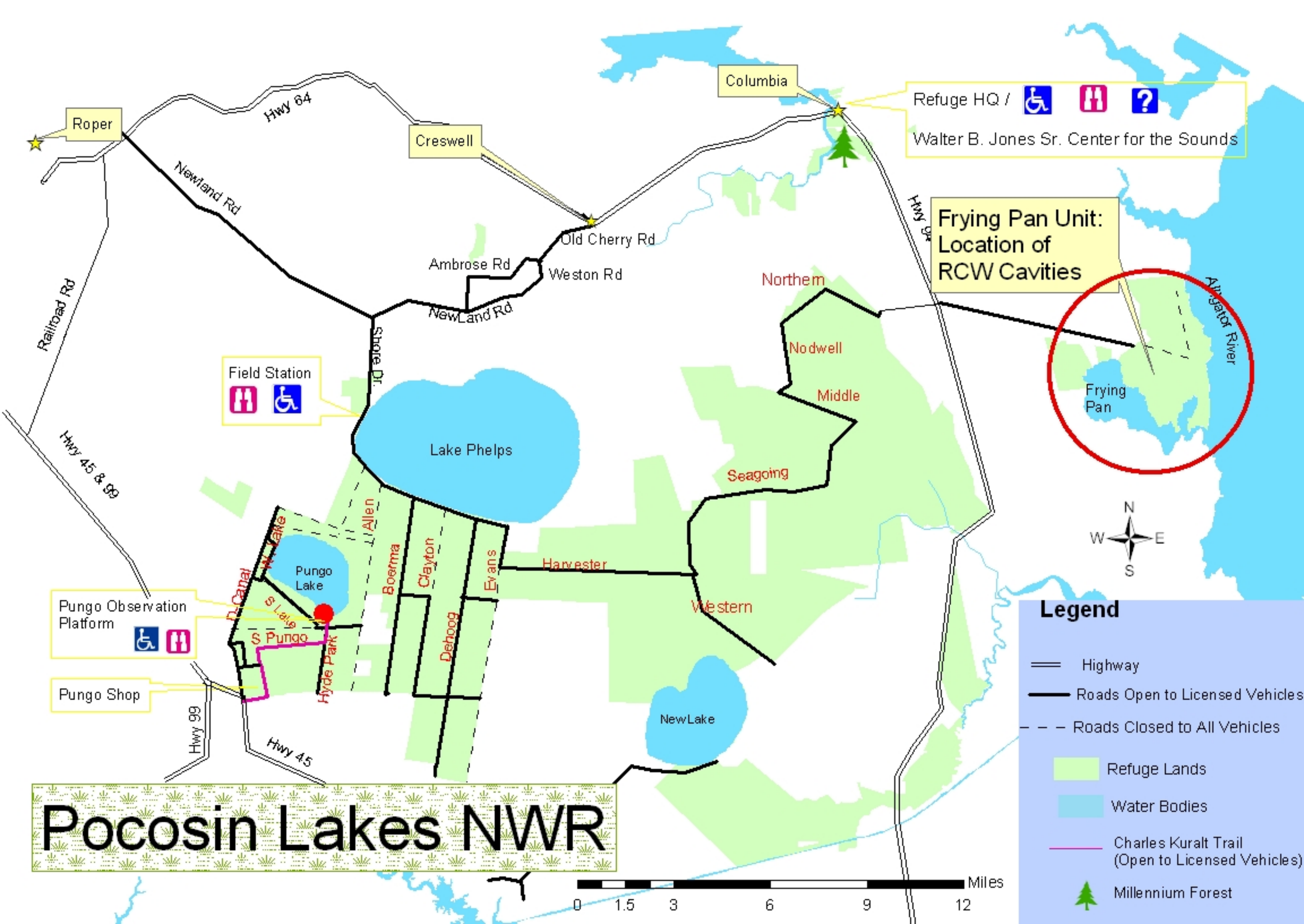
Red wolf (*Canis rufus*)		X		
Southern bald eagle (*Haliaeetus leucocephalus*)		X		
Red-cockaded woodpecker (*Picoides borealis*)		X		
American alligator (*alligator mississippiensis*)		X		
Sensitive joint vetch (*Aeschynomene virginica*)		X		

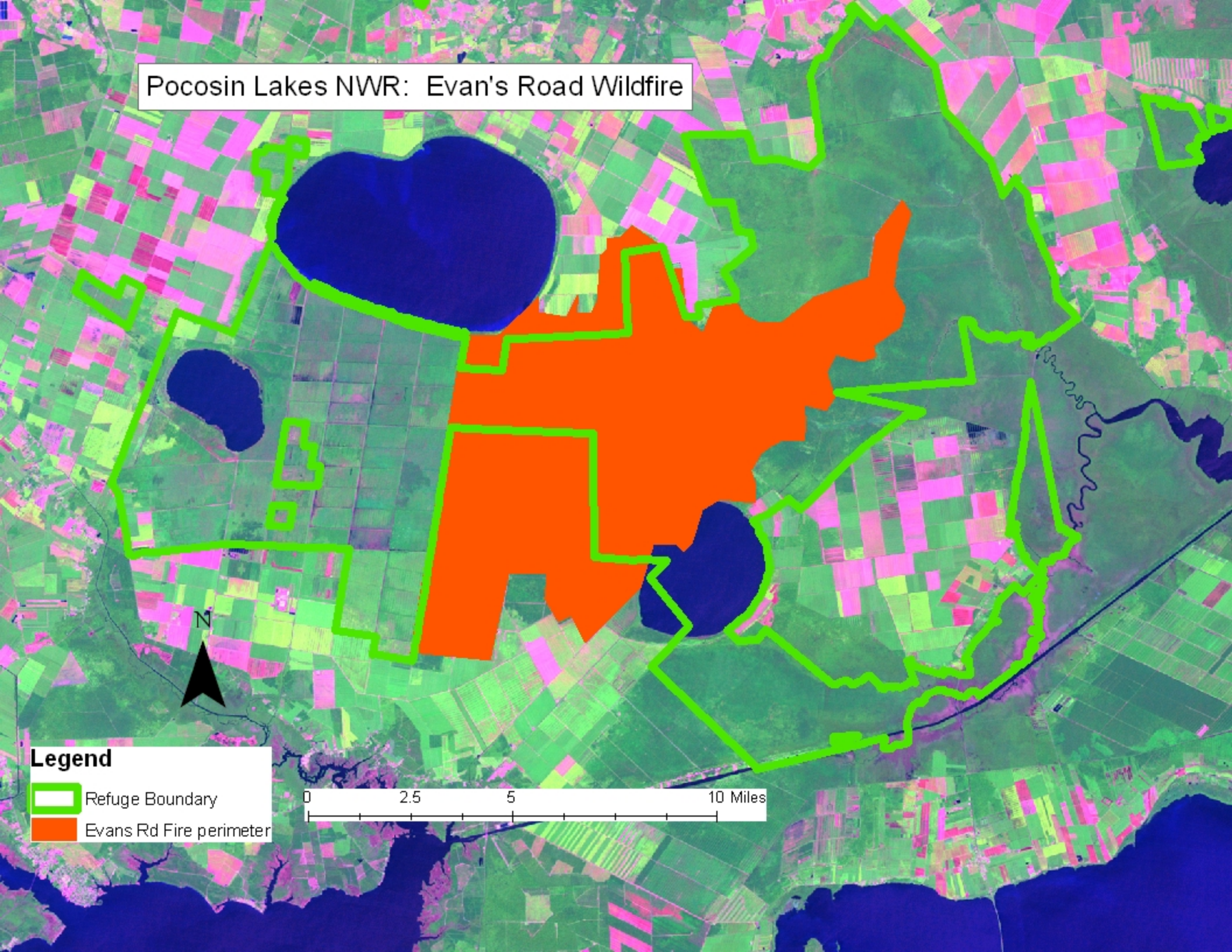
[1] Determination/Response Requested:

NE = no effect. This determination is appropriate when the proposed action will not diretly, indirectly or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but A Concurrence[@] is recommended for a complete Administrative Record.

NA= not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is A Concurrence.

AA= likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is A Formal Consultation. Response Requested for proposed or candidate species is A Conference.


Pocosin Lakes NWR
Roper
Hwy 64
Newland Rd
Creswell
Columbia
Refuge HQ /
Walter B. Jones Sr. Center for the Sounds
Frying Pan Unit: Location of RCW Cavities
Old Cherry Rd
Ambrose Rd
Weston Rd
NewLand Rd
Railroad Rd
Shore Dr.
Field Station
Lake Phelps
Hwy 45 & 99
Northern
Nodwell
Middle
Seagoing
Harvester
Western
Frying Pan
Alligator River
N
W
E
S
Allen
Boerma
Clayton
Evans
Dehoog
Hyde Park
Pungo Lake
Pungo Observation Platform
Pungo Shop
S Pungo
NewLake
Hwy 99
Hwy 45
Legend
Highway
Roads Open to Licensed Vehicles
Roads Closed to All Vehicles
Refuge Lands
Water Bodies
Charles Kuralt Trail (Open to Licensed Vehicles)
Millennium Forest
Miles
0
1.5
3
6
9
12


Pocosin Lakes NWR: Evan's Road Wildfire
N
Legend
Refuge Boundary
Evans Rd Fire perimeter
0
2.5
5
10 Miles

PROJECT NAME (Grant Title/Number): Evans Road Fire Burned Area Rehabilitation Plan

Wendy D. Stanton — 9-4-08

signature (originating Station) — date

Wildlife Biologist

title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence ✓ Nonconcurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

John A. Hammond — 9-8-08

signature — date

Endangered Species Coordinator — Raleigh Field Office

title — office

APPENDIX VII - REFERENCES

Department of Interior. 2006. Interagency Burned Area Rehabilitation Guidebook Version 1.3.

Fish and Wildlife Service. 1999. Pocosin Lakes National Wildlife Refuge. Forest Habitat Management Plan.

Fish and Wildlife Service. 1999. Fire Management Plan. Pocosin Lakes NWR.

Fish and Wildlife Service. 2006. Burned Area Rehabilitation Plan. Rickwod Fire. Big Branch Marsh National Wildlife Refuge.

Fish and Wildlife Service. 2006. Preliminary Final Technical Guide for the Treatment of Invasive Plants on Fire-affected National Wildlife Refuges in Alaska.

Fish and Wildlife Service. 2007.Draft Comprehensive Conservation Plan. Pocosin Lakes National Wildlife Refuge.