

**National Park Service
United States Department of the Interior**

**Big Cypress National Preserve
Florida**



ENVIRONMENTAL ASSESSMENT Copeland Prairie Mitigation Plan

March 2014



ENVIRONMENTAL ASSESSMENT

**COPELAND PRAIRIE MITIGATION PLAN
BIG CYPRESS NATIONAL PRESERVE**

MARCH 2014

United States Department of the Interior–National Park Service

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CHAPTER 1. INTRODUCTION

The National Park Service (NPS) proposes to implement a plan to enhance wetlands in a 325-acre portion of Copeland Prairie in Big Cypress National Preserve, Florida (Figure 1), that if implemented would reverse much of the adverse hydrologic and ecological impact caused by construction of road-related infrastructure in the last century. This project is required by state and federal permits as mitigation for wetland impacts from stabilization of off-road vehicle (ORV) trails elsewhere in the Preserve, in accordance with the Preserve's recreational ORV management plan (NPS 2000). The mitigation would be accomplished through the following objectives:

- Restoring freshwater flow into wetlands to more closely approximate the hydrologic regime prior to infrastructure construction;
- Decreasing the extent of saltwater intrusion into freshwater areas; and
- Restoring wetland habitat that existed prior to hydrologic alteration.

This plan is needed to restore natural sheet flow hydrology once prevalent in the Copeland Prairie wetlands. This area is part of a larger area of formerly uninterrupted wetlands now partitioned by roads, levees, and canals, which tend to diminish the prevalence and duration of surface water on the landscape. The primary purpose of this road-affiliated drainage infrastructure, which predates the 1974 establishment of the Preserve, was to dewater surrounding wetlands for eventual land development. Elevated roadbeds act as low-level dams that block regional sheet flow, and adjacent borrow canals channel that water away. The result is a net loss of fresh water to tide via the canals and shortening of water duration in adjacent wetlands and in the shallow aquifer, thereby increasing the area's susceptibility to drought, destructive wildfires, coastal saltwater intrusion, and invasive exotic vegetation. Since the 1980s the National Park Service has occasionally added retrofits to this road drainage infrastructure in attempts to lessen its overall drainage effects; however, these fixes have been mostly local-scale. Many problem areas in the Preserve, such as Copeland Prairie, still persist.

This environmental assessment (EA) analyzes the impacts on the human environment of two alternatives: the no-action alternative and the preferred alternative. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ, 40 CFR 1508.9), and NPS Director's Order Number 12 (DO-12, NPS 2001) and Handbook.

Big Cypress National Preserve Legislative History

The Preserve was established by Congress in 1974 "to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof" (PL 93-440). The enabling legislation states that the Preserve, as a unit of the national park system, is to be managed in a manner that will ensure its "natural and ecological integrity in perpetuity." The legislation further states that the management of the area should be in accordance "with the provisions of the Act of August 25, 1916," i.e., the NPS Organic Act. Thus, the natural and ecological integrity of the Preserve is the fundamental value that Congress directed the National Park Service to protect. In April 1988, PL 93-440 was

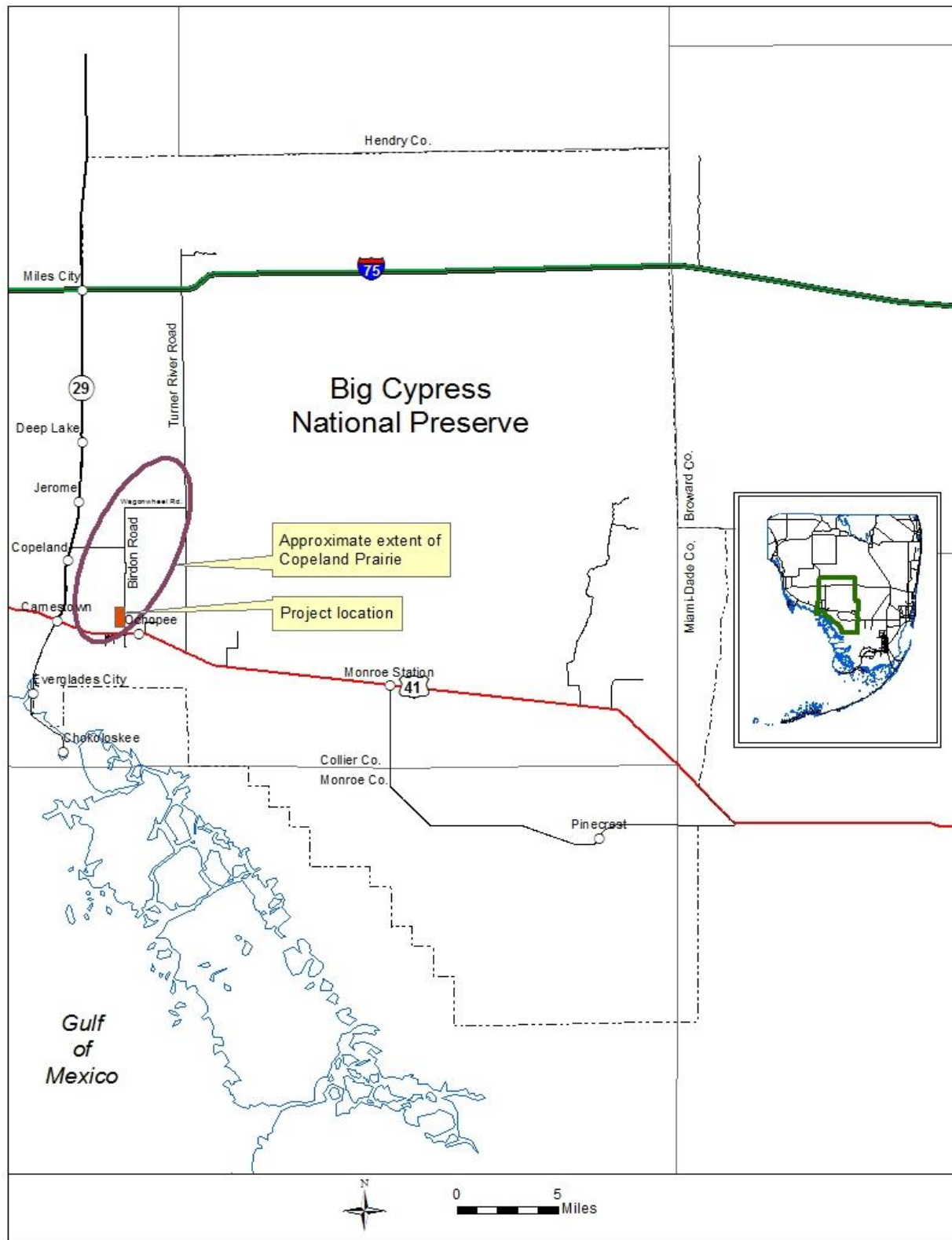


Figure 1. Mitigation Site Location

amended by PL 100-301, the Big Cypress National Preserve Addition Act, which expanded the Preserve by 146,000 acres. The new area was designated as the “Big Cypress National Preserve Addition.”

Purpose and Significance of the Preserve

The Preserve, including the Addition, contains vestiges of primitive southwest Florida. It is significant as a unit of the national park system because it:

- Is a large wetland mosaic that supports a vast remnant of vegetation types found only in this mix of upland and wetland environments;
- Contains the largest stands of dwarf cypress in North America;
- Is habitat for the Florida panther and other animal and plant species that receive special protection or are recognized by the State of Florida, the US government, or the Convention on International Trade in Endangered Species;
- Provides opportunities for the public to pursue recreational activities in a subtropical environment;
- Is home to the Miccosukee Tribe of Indians of Florida and Seminole Tribe of Florida and sustains resources that are important to their cultures; and
- Is a watershed that is an important component to the survival of the greater Everglades ecosystem.

Legislative Mandates and Special Commitments

Legislative mandates and special commitments include those measures that apply to the entire National Park Service plus Preserve-specific requirements. The intent of the mandates and commitments is to establish sustainable conservation and to avoid impairment of NPS lands and resources. Visitor use can occur only to the extent that it does not significantly adversely impact the Preserve and its natural and cultural resources.

The National Park Service and its mandates are authorized under the NPS Organic Act (16 USC 1, 2-4) and the General Authorities Act (16 USC 1a-8). These acts direct the agency to conserve the scenery, the natural and historic objects, and the wildlife, and to provide for the enjoyment of those resources in such a manner as to leave them unimpaired for future generations. Amending the Organic Act, the Redwood Act (March 27, 1978, 16 USC 1a-1) was passed shortly after the Preserve was established, with complete knowledge of how the act would affect such units as Big Cypress. In this act, Congress reaffirmed the mandates of the Organic Act and provided additional guidance on national park system management: “The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established.” In implementing this proposal, the National Park Service would comply with all applicable laws and executive orders, including the following:

Special Status Species

Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), requires all federal agencies to consult with the US Fish and Wildlife Service (FWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. The National Park Service has been informally consulting with FWS and will continue to comply with the requirements of ESA on this plan.

Cultural Resources

The National Park Service is mandated to preserve and protect its cultural resources through the Organic Act; specific legislation such as the Antiquities Act of 1906, NEPA, and the National Historic Preservation Act of 1966 (NHPA); *NPS Management Policies 2006* (NPS 2006a); DO-28, *Cultural Resource Management* (NPS 1998); and the Advisory Council on Historic Preservation's implementing regulations, *Protection of Historic Properties* (36 CFR 800).

This EA will be forwarded to the Florida State Historic Preservation Officer (SHPO) for review and comment and for concurrence with the National Park Service's determination that neither of the alternatives would adversely affect properties on or eligible for the National Register of Historic Places.

The area proposed for hydrologic restoration (the area of potential effect) was surveyed for cultural resources and none were discovered. In the unlikely event that buried human remains or other items of archeological significance were discovered during project development, work would stop and the National Park Service would begin consultations under NHPA and the Native American Graves Protection and Repatriation Act (NAGPRA).

Water Quality

Regulations implementing Section 404 of the Clean Water Act (CWA, 33 USC 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 401 et seq.) are administered by the US Army Corps of Engineers (ACOE), which issues permits for work affecting navigable waters and wetlands of the United States. The State of Florida requires an Environmental Resource Permit (ERP) from the South Florida Water Management District (SFWMD) for construction projects in wetlands and other surface waters within the District's boundary. This project is required by ACOE Permit SAJ-2002-3115 and SFWMD ERP 11-02135-P.

Under the State of Florida designation of Outstanding Florida Waters, no degradation of water quality, other than that allowed in Rule 62-4.242(2) and (3), FAC, is to be permitted. The Preserve falls under this designation, and thus the no-degradation requirement applies. All work implemented as described in this plan would incorporate best management practices (BMPs) in accordance with permit requirements to avoid and minimize impacts to water quality.

Floodplains Management

Executive Order (EO) 11988, *Floodplain Management*, directed federal agencies to avoid development in floodplains whenever there is a practicable alternative and to avoid, to the extent possible, adverse impacts associated with the occupancy or modification of floodplains. DO-77-2, *Floodplain Management* (NPS 2003), implements EO 11988 and applies to any NPS

proposed action that could adversely affect the natural resources of floodplains or increase flood risks. When it is not practicable to locate or relocate development or inappropriate human activities to a site outside and not affecting the floodplain, a floodplains statement of findings, prepared in accordance with procedures described in Procedural Manual 77-2, *Floodplain Management* (NPS 2002b), is required. Since the hydrologic improvements described in the preferred alternative would not have adverse impacts on floodplains and would not increase flood risk, DO-77-2 does not apply, and a floodplains statement of findings will not be prepared.

Wetlands Management

EO 11990, *Protection of Wetlands*, implemented in the NPS by DO-77-1, *Wetland Protection* (NPS 2012a), was issued to avoid adverse impacts to wetlands and new construction in wetlands wherever there is a practicable alternative. For projects having adverse impacts on wetlands, DO-77-1 requires a wetlands statement of findings to be prepared in accordance with Procedural Manual 77-1, *Wetland Protection* (NPS 2012a). Since the hydrologic improvements described in the preferred alternative would not result in adverse wetland impacts, a wetlands statement of findings will not be prepared.

Previous Restoration Efforts

Before development, the wetlands in the Copeland Prairie area were hydrated in the wet season by sheet flow, a broad, slowly moving, shallow layer of fresh water. This flow was primarily in a northeast-to-southwest direction and terminated in the Gulf of Mexico estuarine system. Birdon, Wagonwheel, and Turner River roads (Figure 1) were constructed in the 1940s–1970s through the common practice of excavating wetlands to obtain material to form an elevated roadbed. On a smaller scale, agricultural roads, such as those in the Copeland Prairie area, were similarly constructed. Many of the roads were accompanied by parallel canals from which the road fill was excavated. The roads have blocked the normal sheet flow through damming and diversion of water into the canals, resulting in a disruption to the normal hydrology of the area. This disruption has caused much of the wetlands and the shallow aquifer to be water-deficient during the May–October wet season, leading to vegetation changes. During the November–April dry season, the canals enable salt water to penetrate inland, causing additional ecological impacts. Susceptibility to drought, wildfires, and exotic plant invasion has also increased because of over-drainage of the wetlands during the dry season.

One of the first attempts to restore the area's hydrology was the 1980 publication of the *Water Management Plan: Turner River Restoration* (Rosendahl and Sikkema 1981), which proposed 19 earthen plugs to impede discharge down the Turner River, Wagonwheel, and Birdon canals and eight culverts to divert flow under the roads. These plugs and culverts were installed in 1988. In 1996, 1.5 miles of the Turner River Canal was plugged, causing the Turner River to flow again, as the newly saved water backed up north of the plug and became redirected through culverts into the river's channel. Additional work was done in 2000 and 2001 to remove flow impediments in the Turner River watershed. Specifically, 1.7 miles of an irrigation canal was filled in and several elevated roads were removed in the Bass Lakes Estates area and west of Turner River Road.

In spite of these hydrologic improvements, undesired impacts remain. While the plugs have reduced canal discharge, high water still bypasses them during the wet season. The culvert conveyance across the roads is deficient, and the canals still pulse high water to tide in the wet season and facilitate saltwater intrusion during the dry season.

Issues and Impact Topics

Issues

DO-12 Handbook defines issues as concerns or obstacles to achieving a goal. The major issues identified for this proposal are:

- Roads, canals, and levees have altered the natural sheet flow of water across the Copeland Prairie area landscape;
- Maintenance of existing culverts and canal plugs would require personnel, equipment, and budgetary commitments; and
- Removal of flow impediments, rehabilitation of culverts, and installation of plugs would require permits, monitoring, and funding.

Derivation of Impact Topics

Specific impact topics were developed for discussion focus and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and executive orders; NPS *Management Policies 2006*; and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further discussion.

Impact Topics Included in This Document

Surface Water Flow. Installation of canal plugs, road removal, and culvert rehabilitation could alter the hydrology of the area.

Water Quality. Construction of hydrologic improvements could affect water quality through temporary increase in turbidity, and restoration of sheet flow into wetlands could affect downstream water quality.

Wetlands. Wetlands could be affected by reintroduction of sheet flow, and former wetlands could also be restored through filling of canals.

Soils. Soils could be disturbed by construction activities.

Floodplains. All of the Preserve is within the 100-year floodplain according to the Federal Emergency Management Agency (FEMA).

Vegetation. Vegetation could be disturbed by construction, and vegetation patterns may change in response to sheet flow restoration, changes in hydroperiod, and use of prescribed fire.

Special Status Species. The Preserve is home to several federally and state-listed special status species, some of which inhabit the Copeland Prairie area.

Other Wildlife. The alternatives could potentially affect the quality of the wildlife habitat or directly disturb individual animals located in the Copeland Prairie area.

Visitor Use and Experience. Visitor use could be affected by implementation of the action alternative. Factors that affect visitor experience are safety, scenery, quality of experience, educational and cultural resources, recreational access, and traffic.

NPS Management and Operations. Construction and maintenance of the project as described in the action alternative would require commitment of NPS resources.

Impact Topics Dismissed from Further Analysis

Several potential topics were dismissed because they would not be affected, or the potential for impacts under the alternatives would be negligible. These topics are listed below with an explanation of why they were not considered in detail.

Cultural Resources. NHPA, the Organic Act, and NPS planning and cultural resource guidelines call for the consideration and protection of historic properties in development proposals (the term historic properties refers to all cultural resources, including prehistoric archeological sites, cultural landscapes, ethnographic sites, and historic sites eligible for or listed on the National Register of Historic Places). The evaluation of potential impacts of proposed actions on significant historic properties is required by NEPA and NHPA, as is attention to the provisions of NAGPRA for sites where human remains or burials may be present.

There are no documented archeological sites in the proposed mitigation site. Construction would occur in previously disturbed areas such as roads and canals. Neither of the proposed alternatives would adversely affect properties on or eligible for the National Register of Historic Places.

Climate Change. According to Loehman and Anderson (2010), predicted climate changes in the Gulf Coast bioregion, which includes the Preserve, include increased air and sea surface temperatures, altered fire regimes and rainfall patterns, increased frequency of extreme weather events, rising sea levels, increased hurricane intensity, and potential destruction of coastal wetlands and the species that reside within them. Prolonged drought conditions, storm surges, and rising sea levels may reduce availability of freshwater resources, alter river and wetland hydrology, increase erosion, and induce changes in the distribution of coastal plant and animal species.

Neither of the alternatives would contribute to climate change, as greenhouse gas emissions would be negligible. Climate change impacts on resources impacted by the alternatives are addressed in Chapter 4, "Environmental Consequences."

Wilderness Resources. Wilderness resources, whether eligible, proposed, recommended, potential, or designated, do not exist in or near the area of concern of this EA.

Noise/Soundscapes. Analysis of potential impacts to natural soundscapes is required by NPS *Management Policies 2006*. Construction would have temporary, negligible noise impacts, and neither alternative would affect the soundscape of the Copeland Prairie area.

Public Health and Safety. Implementation of this plan would pose no health or safety risks for Preserve visitors or staff.

Air Quality. The 1963 Clean Air Act , as amended (CAA, 42 U.S.C. 7401 et seq.), requires federal land managers to protect air quality, while NPS *Management Policies 2006* addresses the need to analyze air quality during park planning. The Preserve is a Class II area under the CAA and is currently within a designated attainment area, meaning that concentrations of criteria pollutants are within standards.

Should the preferred alternative be implemented, local air quality would be temporarily affected by dust and vehicle emissions from hauling material and operating construction equipment. Volatile organic compounds, ozone, carbon monoxide, and sulfur dioxide emissions would generally disperse quickly from the construction area. This would last only as long as construction activities occurred and would have a negligible effect on regional pollutant levels.

Fugitive dust plumes from construction equipment and vehicle traffic would intermittently increase airborne particulate concentrations in the area near the project site, depending on soil moisture. This dust would be temporary and highly localized and would have a negligible effect on regional particulate levels. In addition, BMPs to control dust would be required during construction.

Fisheries. Recreational fishing in the Preserve is regulated by the Florida Fish and Wildlife Conservation Commission (FWC), and no commercial fishing is allowed. Implementation of this plan would not affect the availability of or accessibility to fisheries resources.

Night Sky/Lightscaapes. It is NPS policy to preserve opportunities for visitors to have an unobstructed view of the night sky. Artificial light pollution can affect this opportunity. Since lighting is not a component of either of the proposed alternatives, no impacts to night sky would occur.

Prime or Unique Farmlands. The Farmland Protection Policy Act and the US Department of the Interior require an evaluation of impacts on prime or unique agricultural lands. These lands require certain soil types and water availability. According to the US Department of Agriculture, Natural Resources Conservation Service, there are no prime or unique farmlands within the Preserve.

Socioeconomics. The socioeconomic environment, including employment, occupation, income changes, tax base, and infrastructure, would not be affected. The alternatives would not increase or decrease the population of the area, nor would they negatively change or impede residents' access to community facilities.

Land Use. No land use plans would be affected by actions proposed under either of the alternatives, nor would implementation of the alternatives induce any changes in land use or increase pressure for development within or adjacent to the Preserve. The actions included in this EA and considered under the alternatives are compatible and not in conflict with local land use plans.

Energy Resources. Neither of the alternatives being considered would result in the extraction of energy resources from the Preserve nor result in a measurable change in energy consumption compared to current conditions. Additionally, neither of the alternatives would affect ongoing oil and gas operations in the Preserve.

Urban Quality and Design of the Built Environment. Consideration of this topic is required by 40 CFR 1502.16. Since neither of the alternatives proposes construction of structures, urban area quality and vernacular designs do not apply.

Environmental Justice. EO 12898 requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects on minorities or low-income populations or communities. Neither of the alternatives is expected to cause adverse health or environmental impacts to minorities, low-income populations, or communities.

Wild and Scenic Rivers. There are no wild and scenic rivers in the Preserve.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources in the Preserve. No lands in the Preserve are held in trust by the Secretary of the Interior for the benefit of the Indians due to their status as Indians.

Private Property. Neither of the alternatives would impact private property.

Coastal Zone Management. In accordance with the Coastal Zone Management Act (CZMA), federal projects in Florida must be consistent with Florida's Coastal Zone Management Plan. The Florida Department of Environmental Protection (DEP) stated by email on November 18, 2013, that the CZMA federal consistency review and concurrence would be covered by SFWMD's permitting decision. Issuance of an ERP from SFWMD is anticipated.

Transportation. The alternatives would not affect the existing road network.

CHAPTER 2. ALTERNATIVES

This chapter presents two alternatives—a no-action and the preferred alternative. The no-action alternative is required by NEPA and serves as a baseline for comparison.

Alternative 1: No Action (Continue Current Management)

Under this alternative, current management of infrastructure would continue. The abandoned farm roads in Figure 2 would remain in place. Existing culverts and earthen canal plugs would remain, but minimal to no effort would be put towards modifying or maintaining them. Culvert maintenance would be done primarily by Collier County and would be limited to the minimum required to achieve hydraulic equalization and road surface integrity; i.e., sediment and nominal vegetation removal. This alternative would not construct any new infrastructure or remove any major impediments to sheet flow.

Alternative 2: Copeland Prairie Wetlands Mitigation (Preferred Alternative)

This alternative would enhance a 1 by 0.5-mile (325-acre) area of disturbed wetlands in Copeland Prairie to satisfy permit mitigation requirements for wetland impacts resulting from stabilization of recreational ORV trails in the Preserve. The alternative (Figure 2) would utilize a three-action hydrologic approach performed in concert with removal of invasive exotic vegetation and application of prescribed fire treatments.

In Action 1, a grid of 6.45 miles (12.15 acres) of abandoned, elevated farm roads would be scraped down to wetland grade, opening 325 acres of over-parched wetlands to regional sheet flow from the north. The method for removing the roads would sequentially involve (1) clearing them of woody vegetation, (2) mechanically removing an approximately 0.5-1.5-foot overburden of fill material to re-establish the footprint of the roads to natural wetland grade, and (3) disposing of all road-removed fill, estimated at 25,000 cubic yards, to build three wetland-grade segments in currently open-water portions of Birdon and Diagonal canals, as described in Action 3 below. The roads would be used to access the site until removal. Disposing of the removed fill in the nearby canals would eliminate the need for long hauling and staging and would enable road removal and canal filling to occur simultaneously. Surveying would be performed to ensure that the re-engineered land surface matches the elevation and uniformity of the adjacent wetlands. Shallow, narrow swales near the roads would be retained to help provide the proper hydroperiod and to serve as spreader features, aiding in evenly distributing sheet flow to all corners of the mitigation site. The southernmost east-west road would similarly remain in place to serve as a spreader feature for retaining and distributing water across the full east-west dimension of the mitigation site.

Action 2 would divert water into the mitigation site from Birdon Road by rehabilitating and re-engineering two existing 24-inch-diameter concrete culverts. These culverts were originally installed to drain the mitigation site, i.e., divert water from the west side of Birdon Road to the east side and into Birdon Canal. This alternative would reverse the flow by:

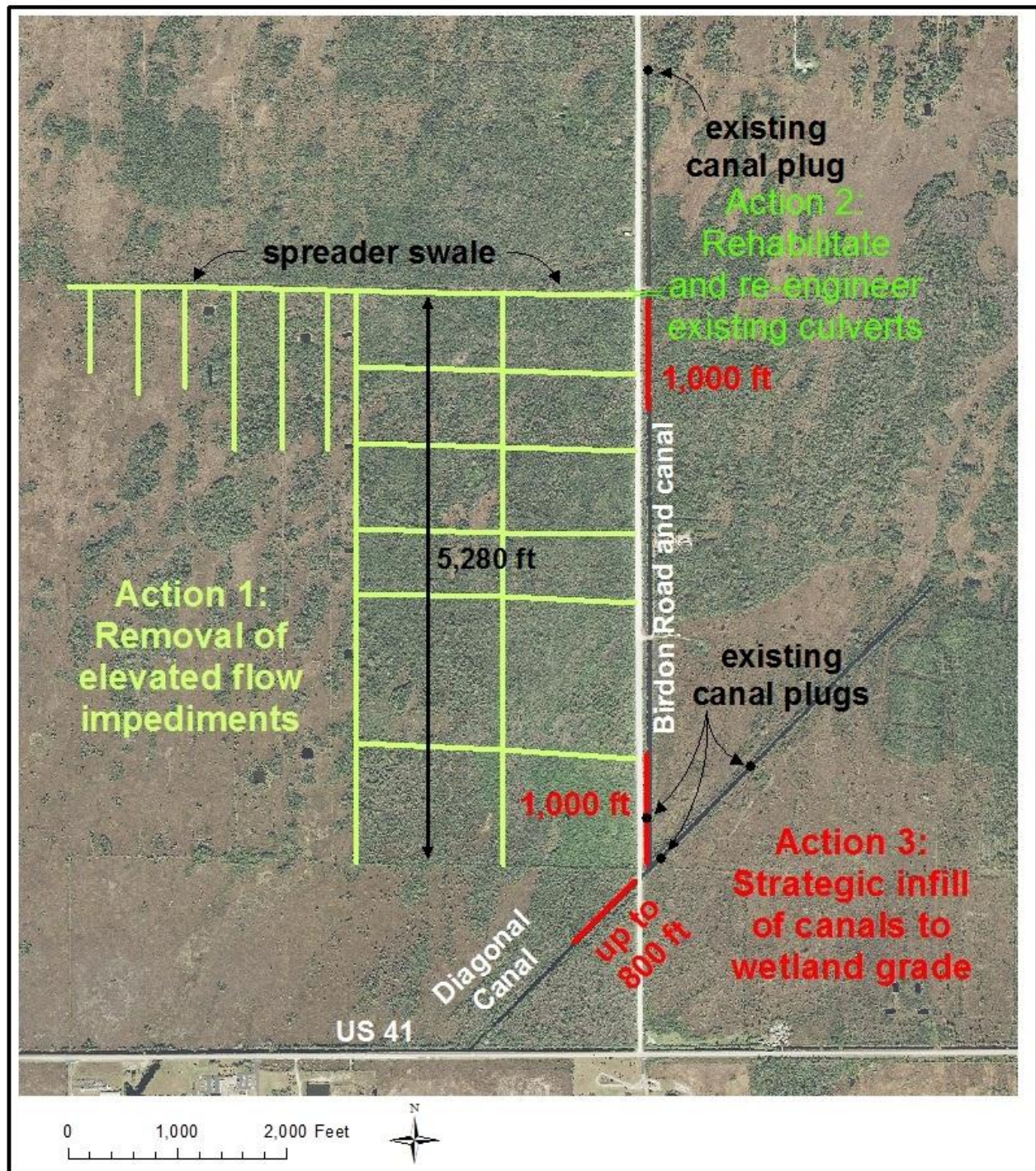


Figure 2. Mitigation Site Features and Proposed Improvements

1. Rehabilitating the culverts by cleaning out the entry, exit, and underground portions of the concrete pipes in coordination with Collier County, and

2. Re-engineering the hydraulics of the culverts to reverse flow direction and increase flow rate and annual volume. Re-engineering would be achieved by (a) re-sculpting the landscape of the west side of the culverts to hydraulically connect culvert flow to the shallow spreader swale that parallels the northern boundary of the mitigation site, and (b) installing an earthen plug in Birdon Canal downstream on the eastern side of the culverts to locally elevate canal stage, as described in Action 3 below. The result of re-engineering would create favorable hydraulics for sending water through the culverts in the desirable direction, rate, and annual volume.

Action 2 would deliver an estimated 6,000 acre-feet of supplemental water into the mitigation site from the east.

In Action 3, Birdon and Diagonal canals would be filled in three separate segments for a total estimated linear fill length of 2,800 feet. The first segment would be located in Birdon Canal, starting at the northern perimeter of the mitigation site and extending 1,000 feet to the south. Its primary purpose would be to hydraulically raise stage to send water at a sufficient rate and annual volume into the mitigation site through the rehabilitated and re-engineered culverts in Action 2. The second segment would be located in Birdon Canal, starting at the canal's confluence with Diagonal Canal and extending 1,000 feet to the north. Its primary purpose would be to provide a barrier for stopping saltwater intrusion from entering Birdon Canal, thus preventing saltwater contamination within freshwater wetlands in and adjacent to the mitigation site and in the underlying aquifer. The third segment would be located in Diagonal Canal, starting 50 feet west of Birdon Road and extending in a downstream direction for a maximum distance of 800 feet. The primary purpose of this segment would be to prevent saltwater intrusion in freshwater wetlands adjacent to Diagonal Canal. The exact length would depend on the total amount of fill generated during the road removal phase (Action 1) of the project. Action 3 would convert 2.5 acres of open canal channel to wetlands and eliminate 1.6 miles of saltwater intrusion via Birdon and Diagonal canals. These measures would be anticipated to return the affected area to a self-sustaining, saltwater-resistant, wet prairie habitat.

A reference site would be designated east of Birdon Road that would represent approximate hydrologic and ecological target conditions for the mitigation site. The mitigation target hydrology would be a hydroperiod of three to five months during summer and fall. The target flow rate in the culverts would be 2,000-6,000 acre-feet per year. Target water depths in feet above ground surface would be:

Summer	0.15 to 0.25
Fall (peak water)	0.30 to 0.50
Winter	-1.00 to 0
Spring (peak drought)	-4.00 to -2.00

The five-year target vegetation cover percentages for herbs, shrubs, trees, and woody exotics would be 30-75, <10, <20, and <5, respectively.

To determine progress toward meeting the above targets, a hydrologic, vegetative, and photographic monitoring program would be implemented. A network of ground/surface water monitoring wells would be established to characterize the relation between surface water and ground-level elevations and quantify pre- and post-mitigation hydrologic response. Flow would be monitored at the culverts, and conductance measured to quantify the degree to which

mitigation actions have excluded tidal inflows in the canals adjacent to the site. Vegetative ground cover and shrub/tree density and height would be estimated from sampling plots. A network of aerial and ground-level photographic points would be established to document annual changes in the engineering, hydrologic, botanical, and prescribed fire aspects of the mitigation. All monitoring would be documented in annual reports to the appropriate state and federal permitting agencies. If monitoring results indicate insufficient progress in meeting target conditions, adjustments such as additional water sources or alteration of the fire regimen would be made.

Mitigation Measures

Mitigation measures to protect natural, scenic, and cultural resources as described below would be implemented under the preferred alternative. All protection measures would be clearly stated in any construction specifications and special construction requirements.

General

- The limits of construction would be identified with construction tape or similar material prior to any construction activity. All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid conducting activities and disturbing areas beyond the construction limits;
- All tools, equipment, barricades, signs, surplus materials, demolition debris, and rubbish would be removed from the project work limits upon project completion;
- Personnel would be required to properly maintain construction equipment and generators (i.e., mufflers) to minimize noise from use of the equipment;
- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment would be checked daily;
- Material would be stored, used, and disposed of in a proper manner;
- Staging areas for equipment and materials would be away from residential properties, and residential property access roads would not be used for truck turnaround areas;
- During construction, visitors, inholders, and nearby residents would be alerted to activities through additional signs along the road, and information would be provided on the Preserve website (www.nps.gov/bicy);
- A hazardous spill plan would be approved by the Preserve prior to construction. This plan would state what actions would be taken in the case of a spill; notification measures; and preventive measures to be implemented, such as the placement of refueling facilities, secondary containment, and storage and handling of hazardous materials;
- BMPs for drainage and sediment control would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas.

BMPs would include all or some of the following actions, depending on site-specific requirements, and CWA Section 401 and 404 and National Pollutant Discharge Elimination System (NPDES) permit requirements:

- Construction would ideally occur during the dry season to limit discharge to surface waters that may be affected by sediment transport;
- Fencing, silt fencing, or similar material would be established prior to construction in order to define the construction zone and confine activity to the minimum area required for construction. Fencing or silt fencing would be installed immediately prior to the start of construction, would be limited in extent to those areas that require protection, and would be removed when all disturbed soil has been stabilized with vegetation;
- Waste and excess excavated materials would be stored outside of drainages to avoid sedimentation. Silt fences, temporary earthen berms, temporary water bars, sediment traps, check dams, or other equivalent measures would be installed around the perimeter of stockpiled fill material;
- Regular site inspections would occur during construction to ensure that erosion control measures are properly installed and are functioning effectively. Personnel would be required to ensure that the erosion control measures (such as silt fences) are repaired at all times and are emptied frequently;
- Water sprinkling would be used, as needed, to reduce fugitive dust in work zones.

Wetlands, Water Quality, and Soils

- Erosion control BMPs for drainage and sediment control, as identified and used by the National Park Service (and outlined above), would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas;
- Accumulated sediments would be removed when the established silt fencing fabric is estimated to be approximately 75% full. Silt removal would be accomplished in a manner to avoid introduction into wetlands;
- The operation of ground-disturbing equipment would be temporarily suspended when there would be a potential for erosion or turbid discharge from heavy rains;
- Fuel and oil services for construction machinery would be provided in a designated area away from surface waters. This would include secondary containment for all fuel storage tanks and on-site availability of a specialized “spill kit” with capacity to contain a 95-gallon fuel spill;
- Floating booms or similar measures would be deployed in the canals during plug construction to contain turbidity.

Vegetation

- Although rare plants are not known to occur in the vicinity of the mitigation site, a plant survey would be completed prior to project construction to identify and locate populations of rare plants that may be present. If rare plants are found, they would be avoided or relocated if possible;
- Temporary barriers would be provided to protect existing vegetation. Trees or other plants would not be removed, injured, or destroyed without prior approvals;
- In an effort to avoid introduction of nonnative species, no hay or straw bales would be used during revegetation or for temporary erosion control;
- To prevent the introduction of and minimize the spread of nonnative vegetation and noxious weeds, the following measures would be implemented during construction:
 - Any revegetation or other plantings would use native species from genetic stocks originating in or near the Preserve;
 - Heavy construction equipment would be kept on hardened surfaces to the greatest extent possible. Construction vehicles and workers would utilize existing pullouts, side roads, and other approved locations for parking and walking to minimize disturbance to vegetation;
 - All construction equipment would be pressure washed and/or steam cleaned before entering the Preserve to ensure that all equipment, machinery, rocks, gravel, and other materials are clean and weed-free;
 - Vehicle and equipment parking would be limited to within construction limits or approved staging areas;
 - Staging areas outside the Preserve would be surveyed for noxious weeds and treated appropriately prior to use;
 - Monitoring for exotic vegetation would occur after project activities are completed. If exotic plants are found, they would be treated according to the methods in the existing exotic plant management plan (NPS 2006b), including hand-pulling of seedlings and herbicide control. Existing exotic plant monitoring stations would continue to be operated by Preserve staff.

Special Status Species and Other Wildlife

- If erosion matting/netting is required, a biodegradable type with mesh that is small enough (½-foot or less) to not entangle snakes and other animals would be used;
- Personnel would be required to keep all garbage and food waste contained and removed daily from the work site to avoid attracting wildlife into the construction zone. Construction workers would be instructed to remove food scraps and not feed, harass, or approach wildlife;
- Wildlife collisions would be reported to Preserve personnel;

- Surveys for special status species would be conducted prior to disturbance of suitable habitat. If any of these species are found, the area would be avoided (if practicable) and mitigation measures would be implemented to minimize impacts. If affected animals need to be relocated, appropriate Preserve personnel would be contacted;
- Construction activities would include appropriate setbacks and/or buffers from nests and/or colonies;
- Mitigation to offset the loss of suitable habitat for protected wildlife in accordance with FWS and FWC protocol would be provided;
- All personnel, including contractors, involved in project activities would receive training on sensitive biological resources that may be encountered in the project area. Personnel would be reminded that harassment, handling, or removal of wildlife and/or other sensitive resources from the project area is prohibited by law. Personnel would be instructed that in the event a special status species is identified within an immediate work area, work would cease until Preserve personnel are notified. Further instructions would be provided by Preserve staff.

Cultural Resources

- In the unlikely event that construction should unearth previously undiscovered archeological resources, work would be stopped in the area of discovery and the Preserve would consult with the SHPO and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in NAGPRA would be followed;
- The National Park Service would ensure that all personnel are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Personnel would also be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment traffic would be minimized in the area of the site. Equipment and materials staging areas would be located to avoid known archeological resources.

Visitor Experience and Preserve Operations

- Preserve employees, visitors, and local landowners would be informed in advance of construction activities via a number of outlets, including the Preserve website, press releases, and visitor centers;
- During construction, visitors and residents would be alerted to activities through additional road signs, and information would be provided on the Preserve website;
- Construction equipment with well-tuned, properly operating mufflers would be used to reduce noise and perform work during low visitation periods;
- Construction activities would be limited to 7 am–6 pm.

Environmentally Preferable Alternative

According to US Department of the Interior regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources.” These regulations also allow for more than one environmentally preferable alternative in some situations.

Based on the analysis of potential impacts included in this EA, the National Park Service has identified the preferred alternative as the environmentally preferable alternative. This alternative would remove or modify much of the infrastructure in the Copeland Prairie area that has caused major changes in hydrology and ecology since the mid-twentieth century.

Table 1. Comparison of alternatives

	Alternative 1 (No Action)	Alternative 2 (Preferred Alternative)
	Current management of infrastructure would continue. Existing culverts and earthen canal plugs would remain intact, but minimal to no effort would be put towards modifying or maintaining them. Culvert maintenance would be limited to the minimum required to achieve hydraulic equalization and road surface integrity; i.e., sediment and nominal vegetation removal. No new infrastructure would be constructed, and no sheet flow impediments would be removed	A 325-acre area of disturbed wetlands in Copeland Prairie would be enhanced by (1) removal of 6.45 miles of abandoned farm roads, (2) rehabilitating and re-engineering culverts to direct more water into the site, and (3) installing three canal plugs to raise canal stage and halt saltwater intrusion. Invasive exotic vegetation removal and prescribed fire would be employed
Additional culverts and/or canal plugs installed?	No	Yes
Sheet flow impediments removed?	No	Yes
Canal plug in-channel length	15 feet	2,800 feet
Meets purpose and need?	No. Existing culverts and plugs only partially allow sheet flow to wetlands adjacent to roads, canals, and levees. Minimal maintenance of culverts and plugs would allow them to deteriorate and lose their effectiveness	Yes. Emphasis would be on long-term restoration, not local or short-term fixes
Cost	0 - \$1,000	\$450,000

Table 2. Objectives of the Alternatives Comparison

Objective	Alternative 1 (No Action)	Alternative 2 (Preferred Alternative)
Reintroduce fresh water into wetlands to more closely approximate the hydrologic regime prior to infrastructure construction	Partially meets this objective because existing culverts and plugs direct some fresh water into under-hydrated wetlands	Meets this objective because repair of culverts and installation of plugs would introduce more fresh water into areas currently impacted by roads and canals
Decrease the extent of saltwater intrusion into freshwater areas	Partially meets this objective through canal plugs; however, the plugs are eroded and largely ineffective	Meets this objective because longer, more effective plugs would be installed
Restore wetland habitat that existed prior to hydrologic alteration	Partially meets this objective by reintroducing some fresh water into areas that need it	Meets this objective because more natural hydrology, exotic plant removal, and application of prescribed fire would encourage re-establishment of the wetland vegetation that existed prior to disturbance

Table 3. Summary of Environmental Impacts

Impact Topic	Alternative 1 (No Action)	Alternative 2 (Preferred Alternative)
Surface water flow	Adverse, long-term, moderate impact from sheet flow obstruction and saltwater intrusion; beneficial cumulative impact	Beneficial impact from removal of sheet flow obstructions; cumulative impact same as in alternative 1
Water quality	Adverse, long-term, minor impact from human activity; adverse, long-term, minor cumulative impact	Adverse, short-term, minor impact from construction activity and adverse, long-term, negligible to minor impact from increase in contaminated water; cumulative impact same as in alternative 1
Wetlands	Adverse, long-term, minor to moderate impact from shortened hydroperiods; beneficial cumulative impact	Beneficial impact from improved hydrology, fire management, and exotic plant removal; cumulative impact same as in alternative 1
Soils	Adverse, long-term, negligible to minor impact from human activity and soil erosion; beneficial cumulative impact	Adverse, long-term, negligible to minor impact from construction and other human activity; cumulative impact same as in alternative 1
Floodplains	Adverse, long-term, negligible impact from flow impedance; beneficial cumulative impact	Beneficial impact from increased floodwater conveyance; cumulative impact same as in alternative 1
Vegetation	Adverse, long-term, moderate impact from dry conditions, exotic plants, and saltwater intrusion; beneficial cumulative impact	Beneficial impact from improved hydrology, prescribed fire, and exotic plant removal; cumulative impact same as in alternative 1

Impact Topic	Alternative 1 (No Action)	Alternative 2 (Preferred Alternative)
Special status species—Florida panther	Adverse, long-term, minor impact from human activity; adverse, long-term, minor cumulative impact. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>	Adverse, short-term, negligible to minor impact from human activity and long-term beneficial impact from habitat improvement; cumulative impact same as in alternative 1. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>
Special status species—wood stork	Adverse, long-term, negligible impact from human activity; adverse, long-term, minor cumulative impact. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>	Adverse, short-term, minor impact from human activity and long-term beneficial impact from improved hydrology and prescribed fire; cumulative impact same as in alternative 1. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>
Special status species—eastern indigo snake	Adverse, long-term, negligible to minor impact from human activity; adverse, long-term, minor cumulative impact. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>	Adverse, short- and long-term, minor impact from human activity and destruction of habitat; cumulative impact same as in alternative 1. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>
Special status species—Florida bonneted bat	Adverse, long-term, negligible impact from human activity; adverse, long-term, minor cumulative impact. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>	Adverse, short-term, negligible to minor impact from human activity and long-term beneficial impact from improved hydrology and habitat; cumulative impact same as in alternative 1. ESA Section 7 determination of effect: <i>not likely to adversely affect</i>
Other wildlife	Adverse, long-term, minor impact from altered habitat and human activity; beneficial cumulative impact	Adverse, short-term, negligible to minor impact from hunting and other human activity and long-term beneficial impact from improved hydrology and habitat; cumulative impact same as in alternative 1

Impact Topic	Alternative 1 (No Action)	Alternative 2 (Preferred Alternative)
Visitor use and experience	Beneficial impact from improved access and absence of construction activity disruptions; beneficial cumulative impact	Adverse, short- and long-term, minor impact from diminished access and disruptions from construction activity; cumulative impact same as in alternative 1
NPS management and operations	Adverse, long-term, negligible to minor impact from NPS management of fire, law enforcement, exotic control, and wildlife monitoring; adverse, long-term, minor to moderate cumulative impact	Adverse, long-term, minor impact from commitment of personnel, equipment, and budget resources; cumulative impact same as in alternative 1

CHAPTER 3. AFFECTED ENVIRONMENT

This chapter describes the characteristics of the existing environmental components identified as impact topics that could be affected by the alternatives. This provides information for analyzing impacts in the “Environmental Consequences” chapter, which assesses the effects the alternatives may have on the impact topics within the affected environment. The description of the affected environment focuses on only those environmental components potentially subject to effects from implementing any of the alternatives.

Surface Water Flow

The Preserve is exceptionally flat, with a typical gradient of only 5–10 inches per mile and elevations ranging from sea level to 19 feet above sea level. Rainfall averages 53 inches per year, but has ranged from 35 to 80 inches. Nearly 80% of the rain normally falls during the six-month wet season of May through October (Miller et al. 2004). Surface water hydrology of the Preserve is typically characterized as a “sheet flow” flooding regime. The hydrologic regime of the Preserve largely determines the patterns in which vegetative communities and their related wildlife species occur.

Three general drainage patterns dominate the Preserve:

- Bands of southwest-trending sloughs and strands, separated by marl prairies and pinelands, which discharge under US 41 (Tamiami Trail) and into the Gulf of Mexico. The Copeland Prairie area covered by this EA is within this drainage pattern;
- In the north, a broad, interior lowland channel with an aggregation of sloughs and hammock islands that drain east into the Everglades;
- In the northwestern corner of the Preserve, a small area of marshes, ponds, prairies, hammocks, and sloughs that drain into Fakahatchee Strand west of the Preserve (Miller et al. 2004).

The Preserve is underlain by an extensive, shallow aquifer that extends from the west coast of Collier County to near the eastern edge of the Preserve. This aquifer is the prime freshwater supply source for Collier County. The aquifer, which is approximately 130 feet thick in western Collier County, becomes progressively thinner to the east, where it eventually disappears near the eastern boundary of the Preserve. This limestone aquifer lies within 10 feet of the surface throughout most of the Preserve. It is non-artesian and contains lenses of confining layers, which prevent circulation of water in the aquifer. The upper part of the limestone section is typically of lower permeability than below, restricting the ability of shallow canals to drain water from the aquifer. The aquifer is recharged by rainfall during the wet season, and overland flow occurs when the aquifer is saturated (Schneider et al. 1996).

Approximately 90% of the Preserve is inundated between a few inches to more than three feet at the height of the rainy season. Because of poor drainage, water pools and slowly drains by sheet flow through the sloughs and strands. During the dry season, between October and May, water levels recede until only approximately 10% of the Preserve remains inundated in ponds and lower portions of sloughs. Although the ground within the Preserve appears to be relatively flat with no well-defined stream systems, flows generally follow bedrock undulations. Marshy

sloughs occupy the shallower undulations, with cypress strands in the deeper ones (Schneider et al. 1996).

Water flows through the Preserve and under US 41 through numerous culverts and bridges before discharging into the Gulf of Mexico. Flows in some sections of US 41 were improved in the mid-1990s by the construction of several new water control structures. The Preserve is essentially a self-contained hydrologic unit recharged primarily by local rainfall (Miller et al. 2004). US 41, finished in 1928, and subsequently constructed roads obtained fill via excavation of parallel canals, resulting in both elevated obstructions to sheet flow as well as channeling of water in open canals.

The hydrology of the Copeland Prairie mitigation site has been affected by human disturbance in the last century. The construction of Birdon Road and numerous farm roads has resulted in interception of much of the sheet flow from the north and east and diversion of the water into canals, causing a lowering of the water table and a decrease in the hydroperiod. Additionally, culverts were installed to enhance drainage of the area to make it suitable for farming.

Water Quality

The original boundary of the Preserve was established at the perimeter of a predominantly self-contained, rain-driven watershed that lies upgradient of Everglades National Park. Major cypress strands were logged in the early 1900s, and areas of the watershed were used as farmland in the decades prior to the Preserve's establishment. However, the area's remoteness limited it to only sparse development, much of which has been reclaimed since the Preserve's establishment in 1974.

The waters of the Preserve are currently designated as Outstanding Florida Waters. This is a state designation, delegated by the US Environmental Protection Agency under CWA, and is intended to protect existing, high-quality waters.

The low-nutrient, high-quality water in the Preserve is vulnerable to degradation from contaminants. Because the water is of such high quality, even small amounts of contaminants can result in relatively large adverse effects. Potential external sources of non-point source pollution primarily include nutrient-enriched runoff from upstream agricultural activities, especially along the northern boundary of the Preserve. Potential internal contaminant sources include leakage and ancillary activities associated with oil and gas exploration and development, operation of vehicles along roads, and oil and fuel leakage and soil disturbance caused by the operation of ORVs.

The Preserve established a long-term water monitoring program for measuring surface water stage and quality in 1988. Water quality samples currently are collected every other month at ten stations located throughout the Preserve. The objective of this water monitoring program is to provide a long-term record for assessing ambient water quality conditions and contamination threats. There are currently no monitoring stations in or adjacent to the mitigation site, so the water quality there is largely unknown. However, the water quality of the site is expected to be high, as it is away from the contaminant sources described above. An environmental site assessment conducted in January 2014 analyzed soil samples taken from the site for metals and pesticides. The assessment concluded that contaminant concentrations were not likely to present a risk to ecological resources and that no further sampling or corrective actions would be required.

Wetlands

Wetlands comprise approximately 88% of the Preserve. The original Preserve and Addition general management plans (NPS 1991, 2010) included comprehensive descriptions of the vegetation resources within the Preserve. The main wetland types are wet prairies, marshes, cypress swamps, mixed hardwood swamps, mangroves, and hydric pinelands.

The Copeland Prairie mitigation site was mostly wet prairie before disturbance, with occasional small mesic hammock islands and frequent bald cypress (*Taxodium distichum*) stands. This wetland type occurs extensively throughout the Preserve, particularly in the western and southern portions. Wet prairies in the Preserve are mostly treeless areas dominated by herbaceous species such as muhly grass (*Muhlenbergia capillaris*), love grass (*Eragrostis* spp.), and sand cordgrass (*Spartina bakeri*). They tend to have sandier soils than the wetter marsh systems and are inundated to a maximum depth of approximately eight inches during the wet season. Wet prairies will burn during periods of drought, and these fires maintain community structure by eliminating invading trees and shrubs.

The FWS National Wetlands Inventory (FWS 2013b) describes the predominant wetland type at the mitigation site as palustrine forested, broad-leaved deciduous/evergreen, seasonally flooded (Figure 3). The transition of the site from wet prairie to this wetland type is probably the result of altered hydrology from road and canal construction and the discontinuation of farming in the last century. Much of the area is now dominated by rank growth of hardwoods, including red maple (*Acer rubrum*), sweetbay magnolia (*Magnolia virginiana*), Florida dogwood (*Cornus foemina*), and wax myrtle (*Myrica cerifera*). This is particularly evident in the eastern limits of the former prairie, where hydrologic perturbations appear to be most severe, and becomes less evident to the west, where hydrologic changes appear to be minimal.

Soils

South Florida lies within the Atlantic Coastal Plain physiographic province. This province is divided into several subprovinces: Big Cypress Swamp, Everglades, Southern Atlantic Coastal Strip, Ten Thousand Islands, Florida Keys, and Southwestern Flatwoods (Figure 4). The Big Cypress Swamp subprovince defines the western boundary of the Everglades subprovince. Comprised of silt, sand, and carbonate minerals, the rocks underlying this area are among the oldest in south Florida (NPS 2008). Coral-rich limestone is exposed in vast areas of the Preserve because the elevation is slightly higher than the Everglades basin. The land surface of the swamp is flat, except for numerous low-mounded limestone outcrops and small, circular, elongated depressions in the limestone. Water in the swamp drains slowly to the south and southwest through a number of cypress strands into the coastal mangrove forest.

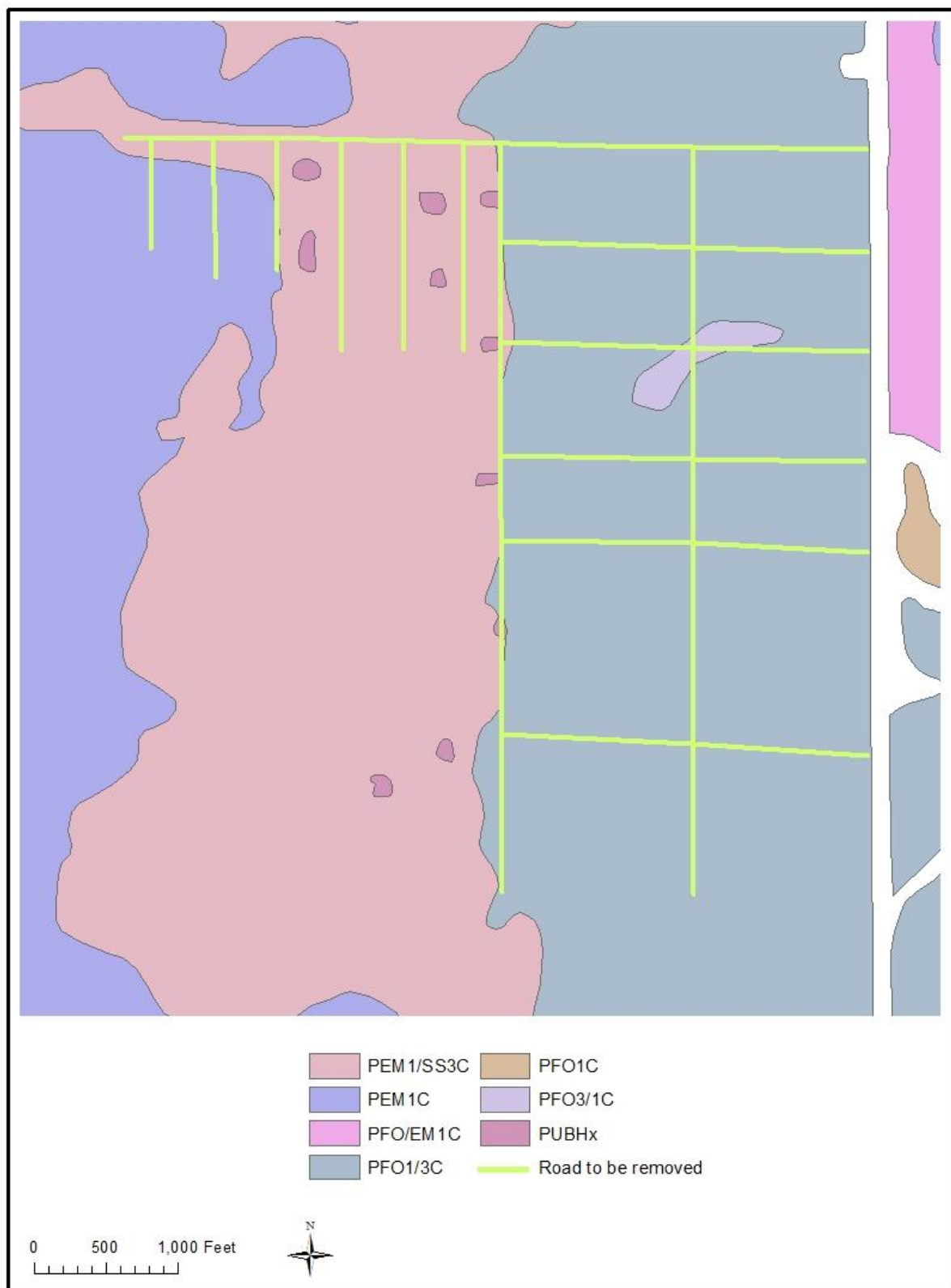


Figure 3. Mitigation Site Wetlands (FWS 2013b)

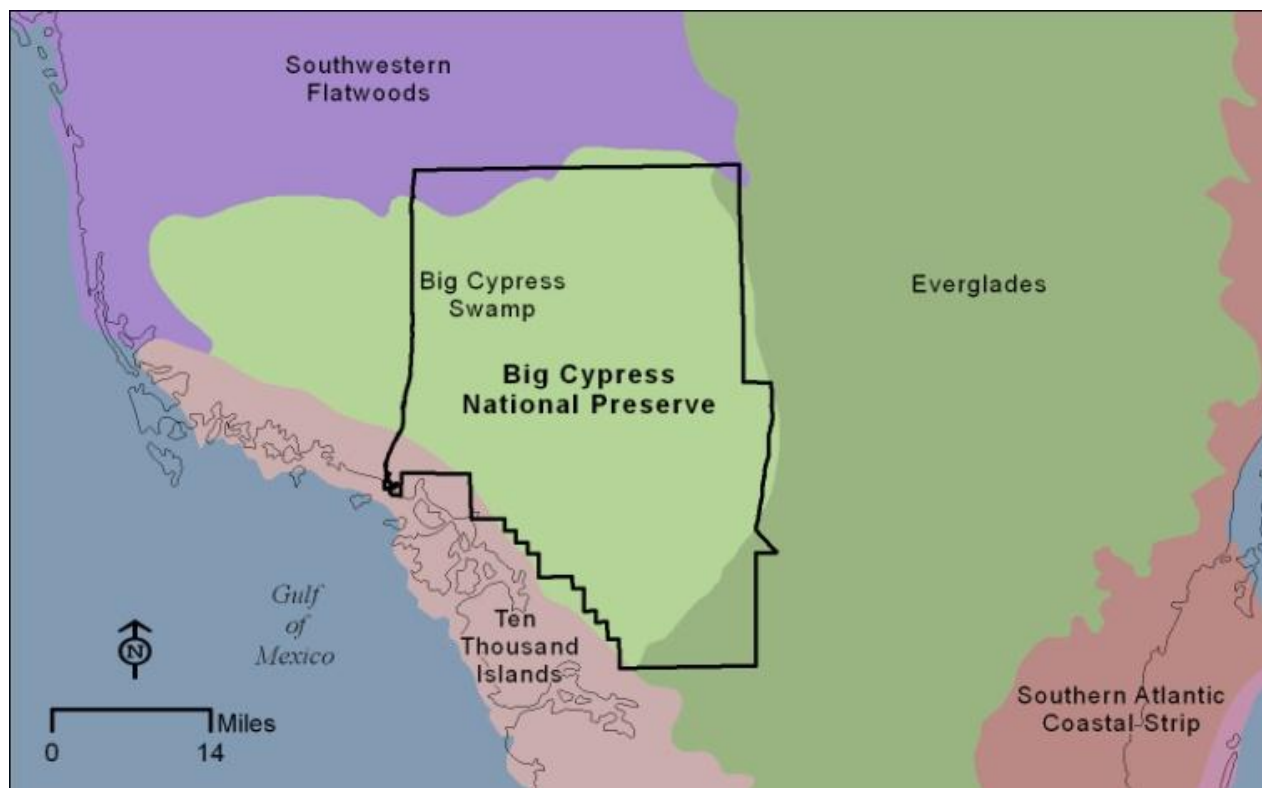


Figure 4. Physiographic Subprovinces for Big Cypress National Preserve (St. Johns River Water Management District 2000)

Duever et al. (1986) conducted extensive research related to the geology of the Preserve prior to completion of the GMP/EIS. They reported that most of the soils in the Preserve are simple geological and biological products that have not had sufficient time or environmental conditions for evolution into true soils. Marl, sand, organic matter, and rock are the four substrate types in the Preserve. Sand deposits within the Preserve are thin, infrequent, and likely derived from old shoreline deposits. Peats derived from partially decayed plant material are also present in the Preserve and are identified by their major plant components, which include mangroves and sawgrass. Cypress domes indicate areas of thicker soil deposition. Typically, these sites were caused by advanced dissolution and subsequent collapse of the limestone rock.

Carbonate marls are the most widespread, unconsolidated soil type in the Preserve. Marls are mixtures of calcareous clays with calcite particles, sand, and/or shell fragments and may have periphyton precipitates at the surface. Marl soils support few trees and provide poor traction when wet.

A 1954 soil survey of Collier County (Leighty et al. 1954) described the soils of the mitigation site as mostly marls, typical of wet prairie habitat (Figure 5). The elevated farm roads, estimated to rise 0.5-1.5 feet higher than natural wetland grade, are likely composed of a combination of marl extracted from adjacent swales and limestone and sand extracted from nearby borrow pits.

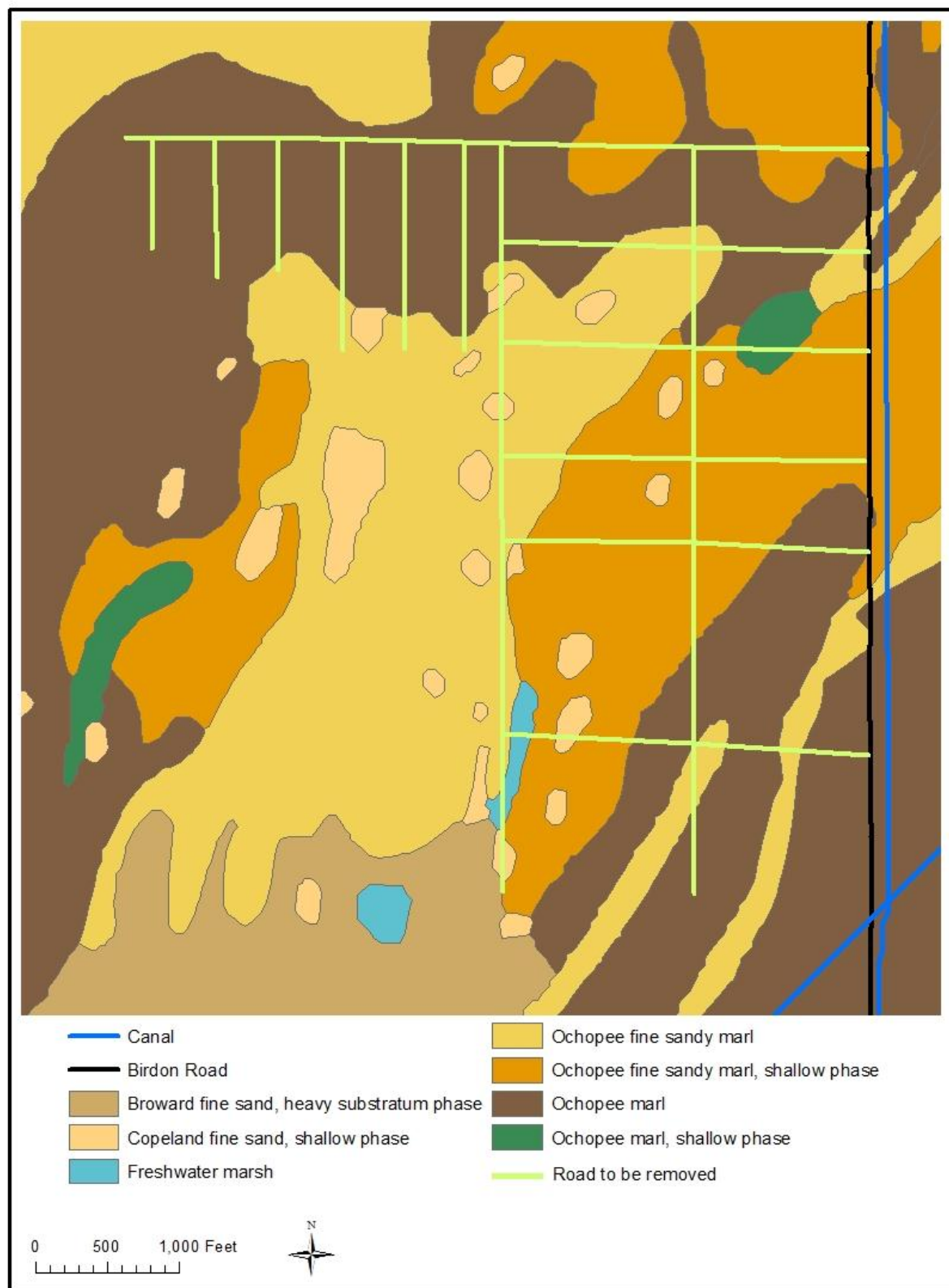


Figure 5. Mitigation Site Soils (Leighty et al. 1954)

Floodplains

According to the FEMA digital flood insurance rate map for Collier County (Collier County 2012), the mitigation site is within the 100-year floodplain. Flooding at the site as a result of a 100-year storm or hurricane storm surge could be as much as seven feet above mean sea level. There are no areas within the Preserve in the coastal high hazard area, and no areas are subject to flash flooding (NPS 1991). Rising sea levels and increased frequency and intensity of extreme weather events due to climate change will most likely require frequent updates to the flood insurance rate map.

Vegetation

Five major vegetation types are found in the Preserve: cypress, prairie, mangrove, pinelands, and hardwood hammocks. Disturbed areas can be found within all the vegetation types. Full discussions of the Preserve's vegetation types are found in the GMPs for the original Preserve and the Addition (NPS 1991, 2010).

The Florida Exotic Pest Plant Council maintains a list of invasive exotic plant species in Florida (FLEPPC 2011). Category I species are those exotics that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. Several Category I species are found in the Preserve, including melaleuca (*Melaleuca quinquenervia*), Brazilian pepper (*Schinus terebinthifolius*), water-hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), small-leaf climbing fern (*Lygodium microphyllum*), crested floatingheart (*Nymphoides cristata*), water-lettuce (*Pistia stratiotes*), and common air-potato (*Dioscorea bulbifera*).

Welch and Madden (1999) mapped the vegetation at the mitigation site as primarily mixed hardwoods, cypress, and pine, with small areas of cypress savanna and hardwood scrub (Figure 6). Recent data from systematic reconnaissance flights conducted by the Everglades Cooperative Invasive Species Management Area (Pernas 2013) combined with ground truth observations indicate several locations containing exotic vegetation, primarily Brazilian pepper (Figure 7).

Relatively undisturbed plant communities nearby and soils/plant community maps that were made in the 1940s lead to speculation that this area was mostly wet prairie with 25 – 30% scattered tree cover before disturbance; the area is now about two-thirds dominated by trees. This proliferation of arborescents appears to have been produced by changes in soils and hydrology. The soils were altered mechanically by agricultural activities when the area was actively farmed, hydrologically by disruption of sheet flow from roads, and perhaps chemically by addition of fertilizers during agricultural operations. Changes in hydrology occurred at about the same time or earlier from drainage associated with Tamiami Trail, construction of Birdon Road and associated drainage, construction of agricultural access roads, and ground contouring to create fields and associated water control structures.

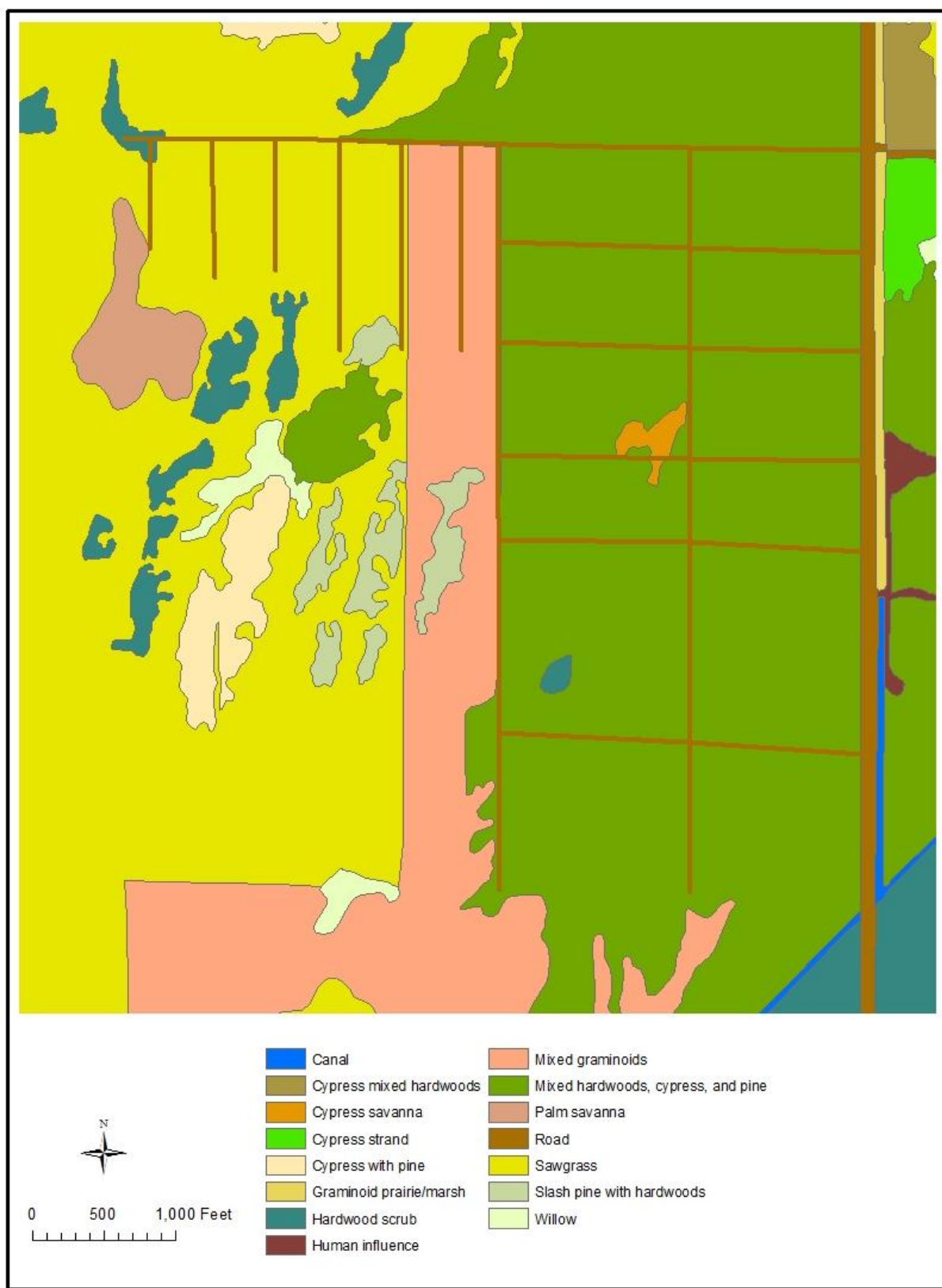


Figure 6. Mitigation Site Vegetation (After Welch and Madden 1999)

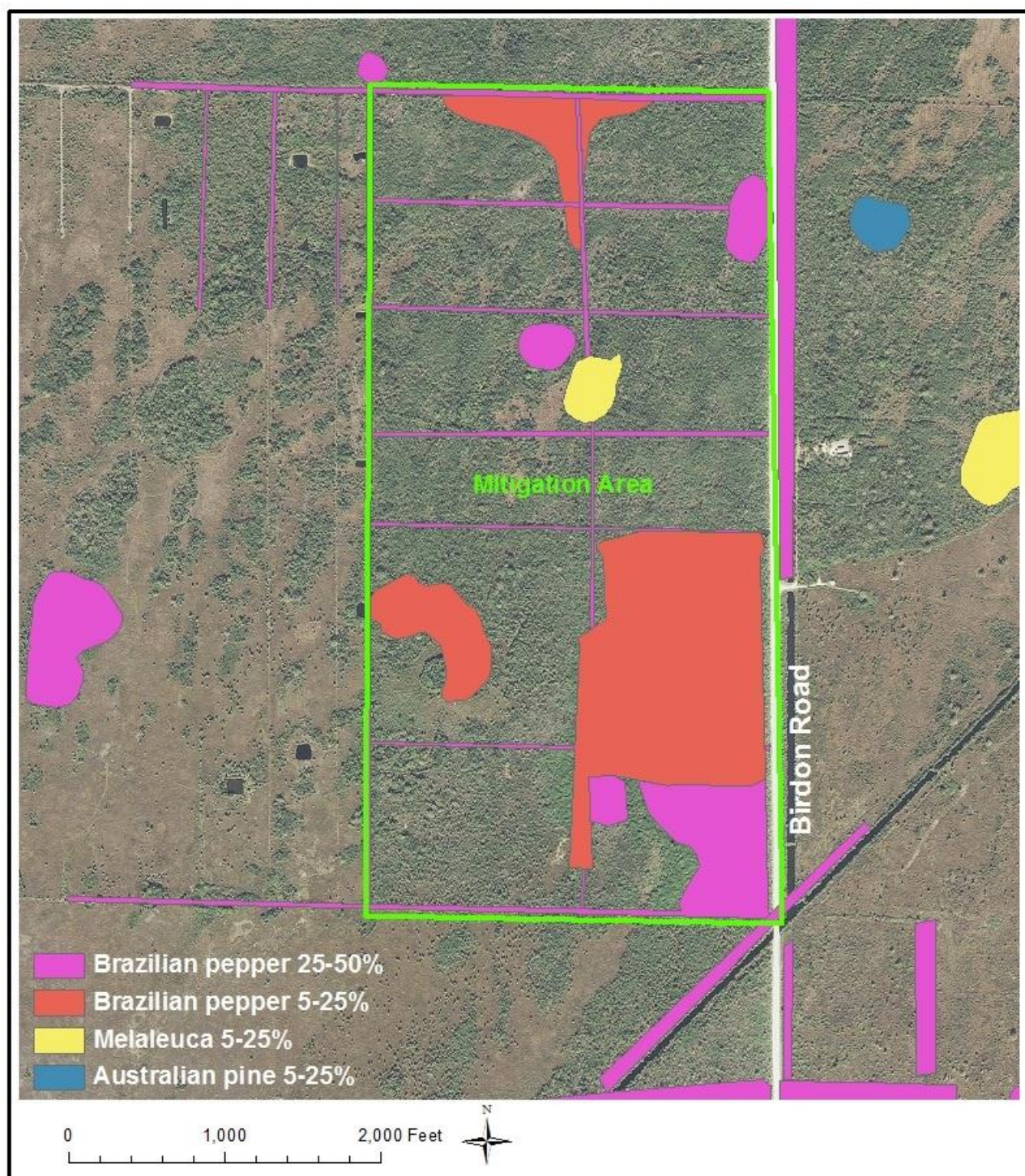


Figure 7. Mitigation Site Exotic Vegetation (Pernas 2013)

Special Status Species

As of 2010, 102 plant species occurred in the Preserve that were listed by the state as endangered, threatened, or commercially exploited (NPS 2010). None of these are federally endangered or threatened, although three are candidates for listing (FWS 2013a).

A total of 29 animal species that could occur in the Preserve receive some level of special protection or are recognized as rare species by the state of Florida or the federal government (FWS 2011, FWC 2013, FNAI 2010). Nine species are listed as federally endangered or threatened and reside in the Preserve. Of these nine species, the four below can be expected to occur in the mitigation site.

Florida Panther (*Puma concolor coryi*)

Endangered Florida panthers once lived throughout most of the southeastern United States, but intensive persecution of these animals, prey decline, and destruction of wildlands severely reduced the population. Today, the only confirmed breeding population is located in south Florida. The current panther population is centered in and around the Preserve, including Everglades National Park, Fakahatchee Strand Preserve State Park, Florida Panther National Wildlife Refuge, and privately owned lands north of the Preserve in Collier and Hendry counties.

Panthers are a landscape species that require large contiguous areas with adequate prey availability and reduced levels of human disturbance. Forest patches comprise an important component of panther habitat in south Florida. Panthers select forested habitat types interspersed with other habitat types that are used in proportion to their availability. Panthers prefer to move through vegetated areas and rarely move through open areas except at night. It is important to maintain vegetated corridors between habitats to allow for panther movement.

The panther's preferred prey items are white-tailed deer (*Odocoileus virginianus*) and feral hogs (*Sus scrofa*). Secondary prey includes raccoons (*Procyon lotor*), nine-banded armadillos (*Dasypus novemcinctus*), marsh rabbits (*Sylvilagus palustris*), and American alligators (*Alligator mississippiensis*).

The National Park Service has an ongoing project monitoring the status of the panther population within the Preserve. The overall purpose is to provide information to management so that their decisions will support and enhance panther recovery and to determine the panthers' behavioral and/or demographic responses to natural events, management actions, and human impacts in south Florida.

Wood Stork (*Mycteria americana*)

Endangered wood storks forage annually in the Preserve when lower water levels provide concentrations of fish. Documented nesting in the Preserve was rare until 1996 when 45 colonies were reported (Jansen and Brooks 1996). The previous two consecutive years of high water and subsequent buildup of the prey base apparently provided ideal conditions in which to raise young. Wood stork nests have been found only sporadically in the Preserve since 1996. The storks feed on fish in shallow water and may use Birdon and Diagonal canals for feeding. The mitigation site is not within the 1,500-foot primary zone or the 2,500-foot secondary zone of a known nesting or roosting site (Ogden 1990).

Eastern Indigo Snake (*Drymarchon corais couperi*)

The threatened eastern indigo snake is a long, black snake of mostly upland habitats in Florida; however, in portions of south Florida, it may also occupy agricultural sites and areas along canals and other artificial waterways. In the northern parts of their range, eastern indigo snakes often take refuge from the cold in gopher tortoise (*Gopherus polyphemus*) burrows, but even in south Florida, where thermal stress may not be a limiting factor, the snakes still seek and use underground refuges. Although not documented at the mitigation site, the abandoned farm roads could provide potential habitat.

Florida Bonneted Bat (*Eumops floridanus*)

Endemic to Florida, the endangered Florida bonneted bat has been recorded or observed in Collier, Charlotte, Lee, Miami-Dade, Monroe, Okeechobee, and Polk counties in a wide variety of habitat types. Little is known about the life history and ecology of this species. Like most bats in Florida, it probably forages for insects over wetlands or open water and roosts in tree cavities or manmade structures. The species has been recorded in the Preserve in the Deep Lake and Cal Stone's camp areas.

Other Wildlife

More than 500 species of birds have been identified in the state of Florida, and a great number of these species occur at least seasonally in the Preserve. Birding is a featured aspect of ranger-led walks, and local Audubon groups reference the Preserve as a birding 'hotspot.'

Alligators are common in the Preserve and occur in open waters, including the Birdon and Diagonal canals, as well as marshes, strands, and creeks throughout. Even more than birds, alligators attract tourists to the Tamiami Canal and at the Big Cypress Swamp Welcome Center, H.P. Williams, Kirby Storter, and Oasis Visitor Center boardwalks. Alligators serve as a keystone species in the south Florida ecosystem. They dig holes in the muck that become refugia for fish, turtles, and other aquatic animals during dry conditions. A plethora of other species of wildlife occurs within the same ecosystem. The alligator's role as a top predator and its effect on plant and associated aquatic animals make it an ideal indicator of ecosystem health (Mazzotti and Brandt 1994).

The original Preserve is established as a Wildlife Management Area (WMA), and hunting is regulated and managed by FWC. Hunting in the WMA is largely dependent on ORV access. Typical game species in the Preserve are white-tailed deer, turkey (*Meleagris gallopavo*), and hogs, but a total of 13 wildlife species are hunted throughout the original Preserve. White-tailed deer harvest rates have been monitored since the late 1980s, and declines in the deer population have recently forced the closure of some areas of the Preserve to hunting. White-tailed deer and feral hogs are also prey for the endangered Florida panther. Alligator hunting is not allowed within the Preserve.

The fact that the Preserve is 88% wetland influences the wildlife that occurs there. Wading birds move across south Florida and the Preserve, as flooding and drought influence the abundance and availability of prey. A variety of reptiles and amphibians occurs in the landscape, and they, too, segregate habitats in part due to the hydrologic regime that they prefer. Mammals either tolerate inundation (white-tailed deer, hogs), move to avoid it (bobcat [*Lynx rufus*]), or travel to take advantage of seasonally flooded wetlands (river otter [*Lontra canadensis*]). The landscape

of the Preserve is a vast area of relatively undisturbed habitat, but the changes in annual patterns of flood and drought create a dynamic environment that requires adaptation from the species that thrive there.

According to FWC's Florida Breeding Bird Atlas (FWC 2003), a number of rookeries have been documented in and around the Preserve. No rookeries occur near the mitigation site. The 2012 South Florida Wading Bird Report (Cook and Kobza 2012) documented two rookeries in the southeastern part of the Preserve.

Wildlife expected at the mitigation site reflects the array of habitats at the site and the surrounding landscape. At canals and creeks, the open water provides habitat for wading birds, belted kingfisher (*Mergaceryle alcyon*), pig frog (*Rana grylio*), red-bellied woodpecker (*Melanerpes carolinus*), and alligator. Pinelands provide habitat for pine warbler (*Dendroica pinus*), brown-headed nuthatch (*Sitta pusilla*), and downy woodpecker (*Picoides pubescens*). Open prairies provide habitat for little grass frog (*Pseudacris ocularis*), ribbon snake (*Thamnophis sauritus*), and palm warbler (*Dendroica palmarum*).

At least 22 nonnative animal species have been collected in the Preserve, 18 of which are known to have breeding populations, such as the feral hog, armadillo, several fish (walking catfish [*Clarias batrachus*], black acara [*Cichlasoma bimaculatum*], spotted tilapia [*Pelmatolapia mariae*], and oscar [*Astronotus ocellatus*]), several insects (fire ants [*Solenopsis* spp.] and lovebugs [*Plecia nearctica*]), and snakes.

Visitor Use and Experience

Visitors to the Preserve can participate in birding, viewing wildlife, sightseeing, experiencing wilderness, and experiencing solitude. Hunting is also a popular recreational activity. Hunting seasons run from September through April.

The use of ORVs is a popular recreational activity within the Preserve. Recreational ORV use is currently restricted to the original Preserve and is governed by the *Recreational Off-Road Vehicle Management Plan* (NPS 2000). Hiking opportunities include Fire Prairie Trail and the Florida National Scenic Trail. The National Park Service collects limited information on visitor statistics for various categories of recreational use. Camping occurs in both frontcountry and backcountry sites.

Visitors drive Turner River and Loop roads to view birds, alligators, and other wildlife in the roadside canals. People commonly fish in roadside canals. Bicycling is gaining in popularity, particularly in the Bear Island area and along the Loop Road and Turner River Road/Birdon Road corridors. Canoeing occurs primarily on Turner River and Halfway Creek, with commercial tours taking frequent trips from US 41 to the Everglades City area. Hiking use on the Florida National Scenic Trail is increasing. Many hikers use the first ten miles of the trail north of Oasis and then turn around rather than hiking all the way through to I-75 or points farther north.

Formal and informal interpretation is available to visitors at the current Big Cypress Visitor Center and the Big Cypress Swamp Welcome Center. Guided bicycle trips, canoe tours, and environmental education activities, as well as swamp walks and hikes on the Florida National Scenic Trail, are offered each winter season from mid-December through early April.

The Copeland Prairie mitigation site and immediately adjacent area contain no visitor amenities such as improved hiking trails or campgrounds, and the area prohibits recreational ORV use. Thus, visitor activity is limited to walk-in hunting and backcountry activities such as hiking, birding, and camping. Adjacent Birdon Road provides convenient access, and the abandoned farm roads can be used for foot access, particularly in the wet season, although the abundance of invasive exotic vegetation can make passage difficult.

NPS Management and Operations

The Copeland Prairie mitigation site is located in the westernmost portion of the Preserve's Turner River Management Unit. The site is open to non-motorized public access and is subject to occasional NPS administrative activity, including law enforcement, exotic vegetation management, fire management, and research activity, including tracking and capture of Florida panthers for radio-collaring and data collection.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

Methodology for Impact Analysis

The National Park Service based the analysis of impacts on the review of existing literature and Preserve studies, information provided by staff, and consultation with tribal, federal, state, and local entities.

The following definitions have been used to describe the impacts associated with the alternatives. Definitions relating to intensity of impact are described for natural resources, visitor use and experience, and NPS management and operations.

Context is the setting within which an impact is analyzed, such as society as a whole, the affected region, the affected interests, and/or a locality. In this EA the intensity of impacts is evaluated within a local (i.e., project area) context while intensity of the contribution of effects to cumulative impacts is evaluated in a regional context.

Duration is a measure of the time period over which the effects of an impact persist. The duration of an impact may be:

- Short-term, meaning impacts would be less than two years in duration.
- Long-term, meaning impacts would be two years or more in duration.

Type - impacts are considered to be either adverse or beneficial when analyzed under NEPA.

Direct effects are caused by the action and occur at the same time and place.

Indirect effects are caused by the action, but occur later in time or are further removed in distance, but must be reasonably foreseeable.

Definitions for Analysis of Natural Resources

The following definitions were used to evaluate the intensity, or severity of impacts, on natural resources associated with the alternatives. The intensity of an impact on surface water flow, water quality, soils, wetlands, and floodplains may be:

- Negligible, meaning the impact would be at the lower levels of detection or not measurable. Natural processes would not be affected;
- Minor, meaning the impact would be detectable and natural processes may be affected in a localized area;
- Moderate, meaning the impact would be clearly detectable and could have an appreciable effect on natural processes; or
- Major, meaning the impact would result in highly noticeable changes and would substantially alter natural processes.

The intensity of an impact on wetlands, vegetation, and other wildlife may be:

- Negligible, meaning the impact would be detectable but would have no principal effect on biological resources;
- Minor, meaning the impact would be detectable but not expected to have an overall effect on natural community structure;
- Moderate, meaning the impact would be clearly detectable and could have an appreciable effect on individual species or natural processes; or
- Major, meaning the impact would result in substantial and highly noticeable influences on individual species or natural processes.

Through coordination with FWS, species of special concern were identified that were generally located in the region. This coordination included information on each species, including their preferred habitat, prey, and foraging areas. Preserve staff then collected more specific information such as the absence or presence of each species within the Preserve boundary and the specific locations being considered. For special status species, the following impact intensities were used to comply with Section 7 of ESA:

- No effect - The alternative would have no effect on the special status species, including listed species;
- Not likely to adversely affect - The alternative would be expected to have an insignificant, discountable, or beneficial effect on the special status species, including listed species; and
- Likely to adversely affect - The alternative would be expected to directly or indirectly have an adverse effect on the special status species, including listed species. Actions that could be likely to adversely affect species would include direct or indirect mortality of individuals; removal of or damage to nesting, breeding, foraging, or roosting habitats; impacts on food sources; and disturbance of nests during the breeding season. For wildlife, removal of vegetation could adversely affect species if it increased their susceptibility to predation.

Definitions for Analysis of Visitor Use and Experience

The following definitions were used to evaluate the intensity of impacts on visitor use and experience associated with the alternatives. The intensity of an impact on visitor use and experience may be:

- Negligible, meaning the impact would not be perceptible or would be barely perceptible by most visitors;
- Minor, meaning there would be a slight change in a few visitors' experiences, which would be noticeable but which would result in little detracting in the quality of the experience;

- Moderate, meaning there would be a change in a large number of visitors' experiences, resulting in a noticeable decrease in the quality of the experience. This would be indicated by a change in frustration level or inconvenience for a period of time; or
- Major, meaning there would be a severe drop in the quality of many visitors' experiences, such as the elimination of a recreational opportunity or a permanent change in access to a popular area.

Definitions for Analysis of NPS Management and Operations

The following definitions were used to evaluate the intensity of impacts on NPS management and operations associated with the alternatives. The intensity of an impact on NPS management and operations may be:

- Negligible, meaning the impacts on existing NPS management and operations would be at or below the level of detection;
- Minor, meaning the impacts on the existing level of NPS management and operations would be small but detectable. The change would be noticeable to staff but probably not to the public;
- Moderate, meaning the impacts on NPS management and operations would be readily apparent to staff and possibly to the public; or
- Major, meaning the impacts on NPS management and operations would be substantial, widespread, and apparent to staff and the public.

Cumulative Impacts

Cumulative Impacts are described in regulations developed by CEQ, 40 CFR 1508.7. A cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts were determined by combining the impact of the alternatives with potential impacts of other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or foreseeable future projects and activities within the region. The following projects and activities were identified:

- A Recreational ORV Management Plan for the original Preserve (NPS 2000) was completed in 2000. Included in this plan is the designation of 15 ORV access points, up to 400 miles of primary trails, and an undetermined amount of secondary trails. Restriction of ORVs to the designated trail system has allowed wetlands previously impacted by dispersed ORV use to recover. Portions of the trail system require rock fill to make them sustainable for ORVs; state and federal permitting agencies have required the restoration of Copeland Prairie as mitigation;

- Over the next several decades there are a number of major water management projects which are anticipated to have major consequences on the hydrology and water quality of the greater Everglades ecosystem, including the Preserve. Most of these projects fall under the auspices of either the Comprehensive Everglades Restoration Plan (CERP) or the Everglades Forever Act (EFA). Implementation of CERP is expected to either partially or fully modify the system of levees and canals along the eastern extent of the Preserve in the next 20 years. The purpose of these projects is to restore the surface water flow regime between the eastern Big Cypress Swamp and the Everglades. Implementation of the EFA is expected to reduce water pollution upstream within the Everglades Agricultural Area. These are waters that do not enter the Preserve under current conditions but may do so in the future as CERP and other projects are completed;
- In 2006 the National Park Service completed construction of ten visitor safety highway improvements along US 41 and Loop Road in the Preserve. These improvements have resulted in benefits to visitor use by improving visitor safety and providing visitors information about the Preserve and its resources. The construction has resulted in adverse, long-term impacts on vegetation and wetlands; however, the impacts are minor to moderate, since the improvements were located to maximize the use of previously disturbed lands;
- An Everglades Ecosystem Restoration Critical Project to construct 77 additional culverts under US 41 is underway. In conjunction with the added culverts, a total of 29 blocking plugs will be constructed or modified in the existing highway borrow canal. Blocking the east-west flow of the borrow canal will balance runoff conveyed by the proposed culverts. The success of this project will rely on the location of the culverts, placed to provide maximum benefits for hydrology as well as achieving the habitat modifications intended. When fully funded, this project will improve the natural sheet flow of surface water within the watersheds of Ten Thousand Islands National Wildlife Refuge and Aquatic Preserve, Picayune Strand State Forest, Fakahatchee Strand Preserve State Park, Everglades National Park, and the Preserve. By creating greater flow beneath US 41, a more natural flow pattern will be established on either side of the highway. The objective of this project is to improve natural hydrology, which will implement biological restoration for this region. Currently, only the portion of the project west of the Preserve has been funded and completed;
- Fire is managed in the Preserve and adjacent public and tribal lands, including Florida Panther National Wildlife Refuge, Fakahatchee Strand Preserve State Park, Collier-Seminole State Park, Rookery Bay National Estuarine Research Reserve, Everglades National Park, state water conservation areas, and the Miccosukee and Seminole reservations. Most, if not all, of these entities use prescribed fire for resource benefit and fuel reduction. An EA of the Preserve Fire Management Plan (NPS 2005) is used as a guideline for fire management in the area;
- The Big Cypress Seminole Indian Reservation Water Conservation Plan is currently underway and is intended to improve the quality of agricultural water runoff within the reservation, restore storage capacity, and return native vegetation within the reservation. It will result in considerable changes to water volume, distribution, and quality within the reservation, which will affect downstream areas in the Preserve. Water management

practices from citrus expansion north of the Preserve may influence hydrology and water quality in the Preserve as well;

- Improvement of up to six ORV trail heads and construction of up to five turn lanes on US 41 is in progress. Trail head improvement at Skillet Strand North (US 41), Monroe Station, and Paces Dike (Loop Road) has been completed, and construction at additional sites will occur as funding becomes available. An EA for this project was completed in 2012 (NPS 2012b);
- The River of Grass Greenway (ROGG) is planned as a non-motorized transportation and recreation corridor that would cross the Everglades, connecting the Everglades with the east and west coasts of south Florida. The pathway would provide multiple use recreational access to various public lands, including the Preserve and Everglades National Park. It is planned as a hard-surfaced, 12- to 14-foot-wide trail that would run parallel to US 41. Feasibility studies for the trail have been ongoing since 2008; and
- A backcountry access plan for the Preserve is in preparation. This plan will provide ORV secondary trails, nonmotorized trails, and a camping management approach that protects the Preserve's natural and cultural resources while providing for public enjoyment. The plan will also establish a permanent route for the Florida National Scenic Trail and other hiking opportunities.

Impacts of Alternative 1 – No Action (Continue Current Management)

Surface Water Flow. Under alternative 1, the abandoned farm roads would remain and continue to act as barriers to sheet flow. The two Birdon Road culverts at the northeast corner of the mitigation site (Figure 2) would remain, and only minimal maintenance, such as cleaning out accumulated sediment and nominal removal of vegetation, would be performed. These culverts were originally installed to divert water away from the area, i.e., from west to east, under Birdon Road and into Birdon Canal. This diversion would continue, perpetuating the water deficiency on the west side of Birdon Road. The eroded, 15-foot-wide plug in Birdon Canal at the southeast corner of the mitigation site would continue to allow southward-flowing, fresh water to bypass it and escape to tide, and salt water to penetrate northward. Under this alternative, no maintenance or modification to the plug would occur, and the water bypasses would continue and most likely increase in magnitude as a result of further erosion. The combined impact on surface water flow from the farm roads, culverts, and canal plug remaining in their current state would be adverse, long term, and moderate.

Cumulative Impacts. Implementation of the ORV management plan will have beneficial impacts to surface water flow by prohibiting ORV use in marl prairies, where rutting can occur. Planned and completed projects under CERP and EFA as well as the installation of culverts under US 41 are expected to result in beneficial impacts to surface water flow. Implementation of the Seminole Water Conservation Plan could introduce increased surface water into the Preserve from the north, possibly increasing surface water flow in the mitigation site. Construction of the ROGG may involve filling of wetlands and disruption of water flows. Climate change could result in altered hydrology due to changes in Preserve rainfall patterns, reduced freshwater flows, and more frequent and longer droughts. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions

as described above, there would be a beneficial impact on surface water flow. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 1, the impact on surface water flow would be adverse, long term, and moderate. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Water Quality. Impacts to water quality under alternative 1 would be mainly attributed to limited NPS management actions and visitor activity. NPS actions may include culvert cleaning, possibly causing a temporary increase in turbidity, and administrative vehicular use in the mitigation site related to fire and exotic plant management, law enforcement, and research activities, which could cause turbidity and inadvertent leaks or spills of fuel or oil. Visitor activities include hunting, hiking, and backcountry camping, which could cause soil erosion or human waste that would affect turbidity and surface water quality. The impact of these infrequent activities would be adverse, long term, and minor.

Cumulative Impacts. Implementation of CERP, EFA, and Seminole water conservation projects will increase surface water flow and connectivity, but the discharged waters are expected to have elevated chemical concentrations that would degrade water quality. Construction of scenic corridor and ORV trailhead improvements may result in an increase in parked vehicles, with an increase in the potential for leaked or spilled fuels and oils. This potential would be mitigated somewhat by related stormwater detention/retention features. Wildfire suppression activities could cause increases in turbidity if firebreaks are constructed. Rising sea levels as a result of climate change could cause salt water to intrude into freshwater areas, thus increasing salinity. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor impact on water quality. The actions contained in alternative 1 would contribute a very small increment to this cumulative impact.

Conclusion. Under alternative 1, the impact on water quality would be adverse, long term, and minor. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 1 would contribute a very small increment to this cumulative impact.

Wetlands. Under alternative 1, hydrologic impediments would remain in place, continuing to disrupt sheet flow into the Copeland Prairie site. The elevated roads and culvert and canal drainage would continue to cause water to be diverted from the site, resulting in a continuation of lowered water table, drier conditions, and plant and animal communities more amenable to shortened hydroperiods. Although the resulting habitat would still be considered wetlands, the functions and values would continue to be representative of a disturbed ecosystem rather than the wet prairie that once prevailed. The impact of implementing alternative 1 would thus be adverse, long term, and minor to moderate.

Cumulative Impacts. Designation of ORV trails has benefitted wetlands by removing ORVs from sensitive terrain and restricting them to sustainable trails. Construction of CERP and EFA projects as well as installation of the US 41 culverts will generally benefit wetlands by restoring sheet flow to wetlands where hydrology has been altered from road, canal, and levee construction. The scenic corridor and ORV trailhead improvements have had locally adverse impacts in that wetlands were filled in order to provide parking and facilities. The ROGG may have locally adverse impacts if fill or boardwalks will be needed in order to construct the trail through wetlands. Implementation of prescribed fire in the Preserve and surrounding lands will

have beneficial impacts to wetlands by reproducing the natural fire cycle and controlling woody growth. The backcountry access plan may result in designation of additional secondary ORV trails, the use of which would have adverse impacts on wetlands. Increases in sea level and salinity as a result of climate change may result in reduction of coastal wetland area, a landward shift in wetland extent, and/or changes in wetland species composition and distribution more characteristic of estuarine systems. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on wetlands. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 1, the impact on wetlands would be adverse, long term, and minor to moderate. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Soils. Impacts to soils under alternative 1 would be attributed primarily to limited NPS management actions and visitor activity. NPS actions may include administrative vehicular use in the mitigation site from fire and exotic plant management, law enforcement, and research activities, which could result in rutting or displacement of soils. This activity would be infrequent, and thus the impact to soils would be adverse, long term, and negligible to minor. Visitor activities include hunting, hiking, and backcountry camping, which could cause soil erosion, but these adverse impacts would be negligible. Collectively, the impact on soils from implementing alternative 1 would be adverse, long term, and negligible to minor.

Cumulative Impacts. Implementation of the ORV management plan will have a beneficial impact to soils by removing ORVs from sensitive soils and restricting them to sustainable trails. Changes in availability of water due to CERP/EFA and Seminole water conservation projects as well as installation of culverts under US 41 could improve or restore the integrity of hydric soils, a beneficial impact. Fire management activities will generally be beneficial to soils, as planned and strategically applied fire will reduce the frequency of hot wildland fires that could ignite organic soils. Construction related to scenic corridor improvements, ORV trailheads/turn lanes, and the ROGG will have adverse, long-term impacts due to displacement of soils. The backcountry access plan may result in designation of additional secondary ORV trails, the use of which would have adverse impacts on soils. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on soils. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 1, the impact on soils would be adverse, long term, and negligible to minor. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Floodplains. Under alternative 1, there would be no construction and therefore no alteration in the input of water during storm events and no additional impedance of surface water flow through the mitigation site. The impact to floodplains would be adverse, long term, and negligible.

Cumulative Impacts. Increased surface water flows as a result of south Florida ecosystem restoration and Seminole water conservation projects and US 41 culverts will affect floodplains by reclaiming some floodplains and improving their integrity and function, a beneficial impact. When the likely effects of implementing the actions in alternative 1 are added to the effects of

other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on floodplains. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 1, the impact on floodplains would be adverse, long term, and negligible. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a very small increment to this cumulative impact.

Vegetation. Impacts to vegetation from maintaining current management of the Copeland Prairie site under alternative 1 would be caused primarily by the continued disruption of sheet flow and perpetuation of unnaturally dry conditions in the wetlands. The prevalence of woody vegetation would continue, and the disturbed sites and higher elevations provided by the abandoned farm roads would continue to offer favorable conditions for invasive exotic plants, such as Brazilian pepper and melaleuca. Vegetation would also be impacted by NPS management actions and visitor activity. NPS actions may include administrative vehicular use in the mitigation site from fire and exotic plant management, law enforcement, and research activities, which could result in destruction of vegetation. This activity would be infrequent, and thus the impacts to vegetation would be adverse, long term, and negligible to minor. Visitor activities include hunting, hiking, and backcountry camping, which could result in trampling of vegetation, but these adverse impacts would be negligible. Collectively, the impact to vegetation from this alternative would be adverse, long term, and moderate.

Cumulative Impacts. Designation of ORV trails has benefitted vegetation by removing ORVs from sensitive terrain and restricting them to sustainable trails, allowing impacted vegetation to recover. Construction of CERP and EFA projects as well as installation of the US 41 culverts will generally promote re-establishment of pre-disturbance wetland vegetation by restoring sheet flow to wetlands where hydrology has been altered from road, canal, and levee construction. The scenic corridor and ORV trailhead improvements have caused locally adverse impacts from vegetation clearing in order to provide parking and facilities. The ROGG may have locally adverse impacts if vegetation will be removed to construct the greenway. Implementation of prescribed fire in the Preserve and surrounding lands will have beneficial impacts to vegetation by reproducing the natural fire cycle and controlling woody growth. The backcountry access plan may result in designation of additional secondary ORV trails, the use of which would have adverse impacts on vegetation. Prolonged dry conditions induced by climate change could also occur. The effects of rising sea levels from climate change, as well as the breached canal plug at the southeast corner of the site, could allow salt water to encroach into the area, causing a shift from freshwater plant community composition to one more characteristic of estuarine hydrology. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on vegetation. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 1, the impact on vegetation would be adverse, long term, and moderate. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Special Status Species—Florida Panther. Impacts to the Florida panther from implementation of alternative 1 would be primarily from limited NPS management activity and visitor use. Ongoing vegetation management through invasive exotics control and prescribed fire would continue to improve habitat for panthers as well as prey species. Partnerships with FWC and

FWS to monitor panthers would continue. Recreational ORV use would continue to be prohibited in the project area, but limited ORV NPS administrative use would continue. Walk-in hunting, backcountry hiking, and camping would continue to be allowed, resulting in possible flushing and displacement of panthers. Overall, the impact to the Florida panther resulting from implementation of alternative 1 would be adverse, long term, and minor. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Implementation of the 2000 ORV management plan will result in beneficial impacts to the panther because ORV impacts will be minimized and habitat improved. Construction of CERP and EFA restoration projects and US 41 culverts may benefit the panther, since sheet flow and hydrologic connectivity, and thus wildlife habitat, will be improved. Similarly, continued fire management in the Preserve and adjacent lands will benefit the panther by improving habitat. The scenic corridor improvements, ORV trailheads, ROGG, and backcountry access plan will adversely affect the panther by introducing development and additional visitors into panther habitat. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor impact on the Florida panther. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Continuation of current management under alternative 1 would result in an adverse, long-term, minor impact to the Florida panther. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Special Status Species–Wood Stork. Any wood stork activity in or near the mitigation site would most likely be in the prairies or along the Birdon and Diagonal canals. Continuation of current management under alternative 1, including limited human activity associated with NPS administrative access, hunting, hiking, and camping, would result in an adverse, long-term, negligible impact on the wood stork. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Implementation of the 2000 ORV management plan will result in long-term, moderate, beneficial impacts to the wood stork because ORV impacts will be minimized and wood stork habitat will be improved. Construction of CERP and EFA restoration projects and US 41 culverts may benefit the stork, since sheet flow and hydrologic connectivity, and thus food supply, will be improved. Similarly, continued fire management in the Preserve and adjacent lands will benefit the stork by improving habitat. The scenic corridor improvements, ORV trailheads, ROGG, and backcountry access plan will adversely affect the wood stork by introducing development and additional visitors into wood stork habitat. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor impact on the wood stork. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Continuation of current management under alternative 1 would result in an adverse, long-term, negligible impact on the wood stork. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor

cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Special Status Species—Eastern Indigo Snake. Impacts to the eastern indigo snake from continuation of current management under alternative 1 would be attributable primarily to limited NPS management activity and visitor use. Ongoing vegetation management through invasive exotics control and prescribed fire would continue to improve habitat for the snake as well as prey species. Recreational ORV use would continue to be prohibited in the project area, but limited NPS ORV administrative use would continue. Walk-in hunting, backcountry hiking, and camping would continue to be allowed, resulting in possible flushing and displacement of snakes. Overall, the impact on the eastern indigo snake resulting from implementation of alternative 1 would be adverse, long term, and negligible to minor. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Implementation of the 2000 ORV management plan will result in beneficial impacts to the eastern indigo snake because ORV impacts will be minimized and habitat improved. Construction of CERP and EFA restoration projects and US 41 culverts may adversely impact the snake, since introduction of more water from improved sheet flow and hydrologic connectivity will possibly decrease the extent of drier habitat preferred by the snake. Continued fire management in the Preserve and adjacent lands will benefit the snake by improving habitat. The scenic corridor improvements, ORV trailheads, ROGG, and backcountry access plan will adversely affect the snake by decreasing available snake and prey habitat. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor impact on the eastern indigo snake. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Continuation of current management under alternative 1 would result in an adverse long-term, negligible to minor impact on the eastern indigo snake. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Special Status Species—Florida Bonneted Bat. Impacts to the Florida bonneted bat from implementation of alternative 1 would be attributable primarily to limited NPS management activity and visitor use on the species' foraging activities. Because activities such as fire management, exotics control, administrative access, hiking, and hunting would occur during the day and the bat is active at night, any impacts to foraging would be adverse, long term, and negligible. There are no suitable cavity trees or nesting structures in the area, so impacts on roosting would also be adverse, long term, and negligible. Overall, the impact on the Florida bonneted bat resulting from implementation of alternative 1 would be adverse, long term, and negligible. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Implementation of the 2000 ORV management plan will result in beneficial impacts to the Florida bonneted bat because ORV activity and hence potential disturbance to the bat will be reduced and wetlands where the bat forages will be restored. Construction of CERP and EFA restoration projects and US 41 culverts may benefit the bat, since increased water flow and levels may provide additional open water and wetlands for foraging. Continued fire management in the Preserve and adjacent lands may benefit the bat by opening up areas

for foraging but may adversely affect the species by destroying active or potential cavity trees. The scenic corridor improvements, ORV trailheads, ROGG, and backcountry access plan will adversely affect the bat by introducing development and additional visitors into bat habitat. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor impact on the Florida bonneted bat. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Continuation of current management under alternative 1 would result in an adverse long-term, negligible impact on the Florida bonneted bat. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Other Wildlife. Under alternative 1, impacts to wildlife other than special status species would be attributed primarily to altered habitat and limited NPS management activity and visitor use. The abandoned roads and altered hydrology would remain, providing favorable habitat for invasive exotic plants such as Brazilian pepper and melaleuca. These exotic plants would continue to displace native vegetation, resulting in degraded wildlife habitat. Although some Brazilian pepper berries would be consumed by birds and mammals, the seeds would remain intact during digestion and the plants would be further spread through the animals' droppings. The presence of exotic plants would require constant vegetation management through invasive exotics control and prescribed fire. The use of prescribed fire to promote early successional stages of vegetation would provide new vegetative growth for white-tailed deer browse. Recreational ORV use would continue to be prohibited in the project area, but limited ORV NPS administrative use would continue. Walk-in hunting, backcountry hiking, and camping would continue to be allowed, resulting in possible harvesting of game animals and flushing and displacement of wildlife. Overall, the impact to wildlife resulting from implementation of alternative 1 would be adverse, long term, and minor.

Cumulative Impacts. Implementation of the 2000 ORV management plan will result in beneficial impacts to wildlife because ORV impacts will be minimized and habitat improved. Construction of CERP and EFA restoration projects and US 41 culverts will benefit wildlife, since sheet flow and hydrologic connectivity, and thus wildlife habitat, will be improved. Similarly, continued fire management in the Preserve and adjacent lands will benefit wildlife by improving habitat. The scenic corridor improvements, ORV trailheads, ROGG, and backcountry access plan will adversely affect wildlife by introducing development and additional visitors into wildlife habitat, resulting in wildlife displacement. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on wildlife. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Continuation of current management under alternative 1 would result in an adverse, long-term, minor impact to wildlife. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Visitor Use and Experience. The continued existence of the abandoned roads under alternative 1 would provide convenient foot access for hunters, hikers, and backcountry campers, a beneficial impact. No mitigation construction would occur, thus there would be no impacts to visitors from noise, area restrictions, and traffic disruptions on Birdon Road. The

impact to visitor use and experience from implementation of alternative 1 would thus be beneficial.

Cumulative Impacts. Implementation of the 2000 ORV management plan, while placing restrictions on ORV users, nevertheless has resulted in beneficial impacts to other visitors by designating large areas of the Preserve as closed to ORVs. Restoration of ecosystems from CERP, EFA, fire management, and culvert installation has benefitted visitors in providing a more natural environment for educational and recreational purposes. The scenic corridor/trailhead improvements, ROGG, and backcountry access plan will improve visitor experience through increased access to the backcountry. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on visitor use and experience. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 1 would result in a beneficial impact on visitor use and experience. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

NPS Management and Operations. Since implementation of alternative 1 would not entail mitigation construction, no commitment of NPS personnel, equipment, and budget resources would be required, a beneficial impact. NPS management and operations would be primarily confined to ongoing, Preserve-wide activities such as fire management, law enforcement, exotic plant control, and Florida panther monitoring, collectively resulting in an adverse, long-term, negligible to minor impact.

Cumulative Impacts. Implementation of the 2000 ORV management plan will require extensive commitment of NPS resources for permit issuance, trail maintenance, and law enforcement. Completion of ORV trailhead construction and scenic corridor improvements will require periodic maintenance, and fire management will require personnel, equipment, and aircraft. When the likely effects of implementing the actions in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor to moderate cumulative impact on NPS management and operations. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 1 would result in an adverse, long-term, negligible to minor impact on NPS management and operations. There would be an adverse, long-term, minor to moderate cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Impacts of Alternative 2 – Copeland Prairie Wetlands Mitigation (Preferred Alternative)

Surface Water Flow. Under alternative 2, surface water flow would be impacted by abandoned road removal, rehabilitation and re-engineering of existing culverts, and placement of fill in Birdon and Diagonal canals. Removal of the roads would open several hundred acres of wetlands to regional sheet flow from the north. Rehabilitating and re-engineering the culverts by unclogging them and connecting the west side of the culvert openings to an existing spreader swale (Figure 2), combined with constructing an earthen plug in the Birdon Canal, would reverse the west-to-east flow and supplement the mitigation site with approximately 6,000 acre-

feet of new water from the east. Strategic infilling of Birdon and Diagonal canals with fill obtained from the road removal would (1) hydraulically raise stage to send water at a sufficient rate and annual volume into the mitigation site, and (2) provide barriers for stopping saltwater intrusion, possibly enhanced by climate change, from entering Birdon and Diagonal canals and adjacent wetlands. The lengths of the plugs (800-1,000 feet) would ensure that water would not bypass them. The beneficial impact to surface water flow from this alternative could counter the potential effects of climate change, including altered hydrology due to changes in Preserve rainfall patterns, reduced freshwater flows, and more frequent and longer droughts. Collectively, the actions described in alternative 2 would result in a beneficial impact to surface water flow.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be a beneficial impact on surface water flow. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 2, the impact on surface water flow would be beneficial. There would be a beneficial cumulative impact. The actions contained in alternative 1 would contribute a small increment to this cumulative impact.

Water Quality. Impacts to water quality under alternative 2 would result from mitigation construction as well as the NPS management and visitor activities described under alternative 1. Excavation of the abandoned farm roads and hauling of fill would cause short-term elevations in turbidity levels and increased potential for leaks and spills of fluids from construction equipment. Similarly, excavation to connect the culverts to the northern spreader swale and deposition of fill into Birdon and Diagonal canals to create plugs would increase short-term turbidity. In the long term, water quality may be adversely impacted from increased flow of contaminated water from outside the Preserve. Collectively, the impact on water quality from actions in alternative 2 would be adverse, short term and minor and adverse, long term and negligible to minor.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be an adverse, long-term, minor impact on water quality. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 2, the impact on water quality would be adverse, short term and minor and adverse, long term, and negligible to minor. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Wetlands. Under alternative 2, wetlands would be impacted by changes in hydrology as a result of road removal, culvert rehabilitation/re-engineering, and canal plugging; and changes in plant community structure brought about by application of prescribed fire to approximate the natural fire cycle and invasive exotic plant removal. These actions would reduce the prevalence of woody vegetation and encourage the return of the herbaceous wet prairie habitat that once prevailed. Introduction of more water into the area would also lengthen the hydroperiod, thus discouraging invasive exotic plant establishment and reducing the potential for frequent and severe wildfires. Installation of the three canal plugs would halt the intrusion of salt water and

hence preserve the freshwater conditions present. These actions would collectively have a beneficial impact on wetlands.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be a beneficial impact on wetlands. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 2, the impact on wetlands would be beneficial. There would be a beneficial cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Soils. Impacts to soils under alternative 2 would be attributable primarily to mitigation construction, NPS management activities, and visitor use. Soils would be disturbed or displaced from construction equipment excavating the farm roads and hauling away the fill, resulting in adverse, long-term, minor impacts. The native soil underlying the filled roads would once again be exposed and available for plant growth, a beneficial impact. Some adverse, minor soil impacts would occur from re-sculpting the landscape of the west side of the culverts to hydraulically connect culvert flow to the shallow spreader swale that parallels the northern boundary of the mitigation site. As in alternative 1, NPS management actions and visitor activities would cause adverse, long-term, negligible to minor impacts. Collectively, the impact on soils from alternative 2 would be adverse, long term, and negligible to minor.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be a beneficial impact on soils. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 2, the impact on soils would be adverse, long term, and negligible to minor. There would be a beneficial cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Floodplains. Implementation of the actions in alternative 2 would result in increased surface water flows to the mitigation site and thus increased depth and duration of seasonal flooding. This improvement in sheet flow would improve overall floodwater conveyance at the site. The impact on floodplains would be beneficial.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be a beneficial impact on floodplains. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 2, impacts on floodplains would be beneficial. There would be a beneficial cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Vegetation. Impacts to vegetation from implementation of alternative 2 would be primarily beneficial and attributable to (1) long-term changes in hydrology as a result of road removal,

culvert rehabilitation/re-engineering, and canal plugging; (2) changes in plant community structure brought about by application of prescribed fire to approximate the natural fire cycle; and (3) short- and long-term changes due to invasive exotic plant removal. These actions would reduce the prevalence of woody vegetation and encourage the return of the herbaceous wet prairie vegetation that once prevailed. Introduction of more water into the area would also lengthen the hydroperiod, thus discouraging invasive exotic plant establishment and reducing the potential for frequent and severe wildfires. Installation of the three canal plugs would halt the intrusion of salt water, and hence preserve the freshwater conditions present. As in alternative 1, adverse, long-term, negligible to minor impacts to vegetation would result from NPS management actions and visitor activity. Overall, the actions under alternative 2 would collectively have a beneficial impact on vegetation.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be a beneficial impact on vegetation. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Under alternative 2, the impact on vegetation would be beneficial. There would be a beneficial cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Special Status Species—Florida Panther. Construction activity related to road removal, culvert rehabilitation, and canal infilling under alternative 2 may temporarily displace Florida panthers and cause adverse, short-term, negligible to minor impacts. Habitat improvement through restoration of sheet flow, invasive exotic vegetation removal, and fire management would have long-term beneficial impacts. Panther monitoring through interagency partnerships would continue to provide information on the species, a beneficial impact. As in alternative 1, NPS administrative ORV access, walk-in hunting, hiking, and camping would continue, resulting in adverse, long-term, negligible to minor impacts. Collectively, impacts to the Florida panther under alternative 2 would be adverse, short term, and negligible to minor and long-term beneficial. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be an adverse, long-term, minor impact on the Florida panther. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in adverse, short-term, negligible to minor impacts and long-term beneficial impacts to the Florida panther. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Special Status Species—Wood Stork. Any wood stork activity in or near the mitigation site would most likely be in the prairies or along the Birdon or Diagonal canals. Because wood storks have nested in the Preserve only sporadically since 1996, effects of alternative 2 would be limited to impacts on foraging habitat and avoidance of certain areas during periods of

human activity. Removal of abandoned farm roads, hauling of fill, and expansion of canal plugs would cause an adverse impact on storks by creating short-term disturbances associated with construction activities. In the long term, limited human activity associated with NPS administrative access, hunting, hiking, and camping would result in adverse, negligible impacts; however, wood stork habitat would be improved and expanded as a result of improved hydrology and application of prescribed fire. Collectively, the impact on the wood stork under alternative 2 would be adverse, short term, and minor and long-term beneficial. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in an adverse, short-term, minor impact and a long-term beneficial impact to the wood stork. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Special Status Species—Eastern Indigo Snake. Impacts to the eastern indigo snake from implementation of alternative 2 would be attributable primarily to effects of construction on potential habitat. Since the abandoned farm roads could serve as potential snake habitat, removal of these roads could have an adverse, short- and long-term, minor impact. Debris and brush piles generated during construction might be an attractant for snakes. This could lead to snake injury or mortality during construction, an adverse, short-term, minor impact. Ongoing vegetation management through invasive exotics control and prescribed fire would continue to improve habitat for the snake as well as prey species. Recreational ORV use would continue to be prohibited in the project area, but limited NPS ORV administrative use would continue. Walk-in hunting, backcountry hiking, and camping would continue to be allowed, resulting in possible flushing and displacement of snakes. Overall, the impact to the eastern indigo snake resulting from implementation of alternative 2 would be adverse, short and long term, and minor. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be an adverse, long-term, minor impact on the eastern indigo snake. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in an adverse, short- and long-term, minor impact to the eastern indigo snake. The determination of effect under Section 7 of ESA would be *likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Special Status Species—Florida Bonneted Bat. Adverse, short-term, negligible to minor impacts to the Florida bonneted bat could result from human activity associated with road removal and canal plug construction under alternative 2. In the long term, recreational ORV use

would continue to be prohibited in the project area, but limited ORV NPS administrative use would continue. Walk-in hunting, backcountry hiking, and camping would continue to be allowed, resulting in possible flushing and displacement of the bat and causing an adverse, long-term, negligible to minor impact. Improvement of hydrologic conditions and removal of invasive exotic vegetation through prescribed fire would improve the bat's habitat, a beneficial impact. Overall, the impact to the Florida bonneted bat resulting from implementation of alternative 2 in the short term would be adverse and negligible to minor and in the long term would be beneficial. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be an adverse, long-term, minor impact on the Florida bonneted bat. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in an adverse, short-term, negligible to minor and long-term beneficial impact to the Florida bonneted bat. The determination of effect under Section 7 of ESA would be *not likely to adversely affect*. There would be an adverse, long-term, minor cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Other Wildlife. Under alternative 2, noise and human activity associated with road removal could flush wildlife from the area, causing an adverse, short-term, negligible to minor impact to wildlife other than special status species. In the long term, recreational ORV use would continue to be prohibited in the project area, but limited ORV NPS administrative use would continue. Walk-in hunting, backcountry hiking, and camping would continue to be allowed, resulting in possible harvesting of game animals and flushing and displacement of wildlife and causing an adverse, long-term, negligible to minor impact. Improvement of hydrologic conditions and removal of invasive exotic vegetation through prescribed fire would improve wildlife habitat, a beneficial impact. The use of prescribed fire to promote early successional stages of vegetation would also provide new vegetative growth for white-tailed deer browse. Overall, the impact to wildlife resulting from implementation of alternative 2 would be adverse, short term, and negligible to minor and long-term beneficial.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions, there would be a beneficial impact on wildlife. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in an adverse, short-term, negligible to minor and a long-term beneficial impact to wildlife. There would be a beneficial cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Visitor Use and Experience. The removal of the abandoned roads under alternative 2 would take away convenient foot access for hunters, hikers, and backcountry campers, an adverse impact. Mitigation construction would occur, resulting in adverse, short-term impacts to visitors from noise, area restrictions, and traffic disruptions on Birdon Road. The impact to visitor use

and experience from implementation of alternative 2 would thus be adverse, short and long term, and minor.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a beneficial impact on visitor use and experience. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in an adverse, short- and long-term, minor impact to visitor use and experience. There would be a beneficial cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

NPS Management and Operations. Implementation of alternative 2 would require mitigation construction, commitment of NPS personnel, equipment, and budget resources, an adverse impact. NPS resources would be needed to monitor and report success of the mitigation and to maintain the site. Ongoing NPS activities such as fire management, law enforcement, exotic vegetation control, and Florida panther monitoring would continue as in alternative 1, collectively resulting in an adverse, long-term, minor impact.

Cumulative Impacts. Cumulative impacts would be the same as under alternative 1. When the likely effects of implementing the actions in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be an adverse, long-term, minor to moderate cumulative impact on NPS management and operations. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

Conclusion. Implementation of alternative 2 would result in an adverse, long-term, minor impact to NPS management and operations. There would be an adverse, long-term, minor to moderate cumulative impact. The actions contained in alternative 2 would contribute a small increment to this cumulative impact.

CHAPTER 5. CONSULTATION AND COORDINATION

This chapter documents the scoping process for the proposed action and identifies permitting requirements.

Scoping

Director's Order 12 requires the National Park Service to make "diligent" efforts to involve the interested and affected public in the NEPA process. This process, known as scoping, helps to determine the important issues and eliminate those that are not; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify other permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made.

The National Park Service consulted with the federal and state agencies responsible for the protection and management of natural and cultural resources. A scoping notice was uploaded to the NPS Planning, Environment and Public Comment (PEPC) website, and agencies, tribes, and the public were notified via a press release on November 7, 2013, in which the National Park Service proposed to complete an EA to analyze the impacts of implementing a Copeland Prairie Mitigation Plan. Requests for scoping comments were mailed on November 12, 2013, to the SHPO, FWS, the DEP's Florida State Clearinghouse, the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and the Seminole Nation of Oklahoma. The public scoping comment period for the project began November 7, 2013, and ended on December 7, 2013.

No responses to the scoping notice from the public or the tribes were received. The Florida State Clearinghouse stated by email on November 16, 2013, that they would withhold comment, since SFWMD would be performing a detailed review of the project and would be coordinating with the appropriate state agencies as part of the permitting process. The SHPO responded by email on January 16, 2014, stating that they had no comments. FWS responded by email on January 16, 2014, with no comments and provided lists of threatened, endangered, and candidate species for Collier and Monroe counties, Florida.

The draft EA will be uploaded to PEPC and the public will be allowed 30 days to comment. Announcement of availability will be made via press release, and tribes and agencies will be notified by letter.

Permitting

Implementation of the preferred alternative would satisfy regulatory agency mitigation requirements for impacts to wetlands from stabilization of ORV trails in the Preserve. This stabilization was authorized by two fill permits:

- ACOE CWA Section 404 permit SAJ-2202-3115(IP-MN) issued in 2004 and subsequently modified it in 2013 to include the Copeland Prairie mitigation, and
- SFWMD ERP #11-02135-P issued in 2002. Application #130718-23, a modification request which includes the Copeland Prairie mitigation, has been submitted to SFWMD

for review. A small portion of the road removal was previously authorized by a permit modification issued in 2010 (Application #090512-15).

In addition to fill permits, an NPDES stormwater permit issued by DEP for large construction activity would be required, as the construction described in the preferred alternative would disturb five or more acres of land.

ABBREVIATIONS

ACOE – US Army Corps of Engineers
BMP – Best Management Practice
CAA – Clean Air Act
CEQ – Council on Environmental Quality
CERP – Comprehensive Everglades Restoration Plan
CFR – Code of Federal Regulations
CR – County Road
CWA – Clean Water Act
CZMA – Coastal Zone Management Act
DEP – Florida Department of Environmental Protection
DO – Director’s Order
EA – Environmental Assessment
EFA – Everglades Forever Act
EIS – Environmental Impact Statement
EO – Executive Order
ERP – Environmental Resource Permit
ESA – Endangered Species Act
FAC – Florida Administrative Code
FEMA – Federal Emergency Management Agency
FLEPPC – Florida Exotic Pest Plant Council
FWC – Florida Fish and Wildlife Conservation Commission
FWS – US Fish and Wildlife Service
GIS – Geographic Information System
GMP – General Management Plan
NAGPRA – Native American Graves Protection and Repatriation Act
NEPA – National Environmental Policy Act
NHPA – National Historic Preservation Act
NPDES – National Pollutant Discharge Elimination System
NPS – National Park Service
ORV – Off-road Vehicle
PEPC – Planning, Environment and Public Comment
PL – Public Law
ROGG – River of Grass Greenway
SFWMD – South Florida Water Management District
SHPO – State Historic Preservation Officer
SR – State Road
US – United States
USC – United States Code
WMA – Wildlife Management Area

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