

# **Compensatory Mitigation Plan Revision to the 2016 Nobles Grade 3-D Seismic Survey Wetland Statement of Findings**

## **Introduction**

On May 10, 2016, the National Park Service (NPS) conditionally approved a Plan of Operations (9B permit) for the Nobles Grade 3D Seismic Survey pursuant to 36 CFR § 9.37(b)(2) (under NPS Nonfederal Oil and Gas Rights Regulations superseded December 5, 2016) and subject to the wetlands compensation mitigation requirements outlined in the Wetland Statement of Findings (WSOF) attached to the Finding of No Significant Impact for the project that was approved on May 6, 2016.

As compensation for any temporal loss of wetland function resulting from vehicle use during the seismic survey, the WSOF required Burnett Oil Co., Inc. (BOCI) to restore wetlands elsewhere in Big Cypress National Preserve (BICY). Specifically, NPS staff were to quantify the amount of impact area from damage caused by vehicle use during the seismic survey as linear feet of impact. To compensate for the temporal loss of wetland functions, BOCI was to restore an equivalent length of areas damaged by off-road vehicles (ORVs) along old ORV trails inside or outside of the project area and within BICY. The intent of the compensation was to restore soil contours and natural hydrologic sheet flow in areas previously impacted by ORVs.

NPS staff have determined that BOCI's Nobles Grade 3D (NG3D) Seismic Survey operations in 2017 and 2018 resulted in 111 miles of impact, or 201.82 acres, that require compensation. NPS ecologists have determined that the ORV impact restoration identified in the 2016 WSOF would create impacts to mature, native, wetland vegetation such as cypress trees in order to access the sites and restore soil contours because of substantial vegetative recovery along the old ORV trails identified as restoration candidates. To avoid these impacts and address higher priorities for restoration at BICY, the NPS proposes to modify BOCI's 9B permit pursuant to 36 CFR § 9.150(b), and instead require that BOCI restore hydrology and native plant communities on approximately 272 acres of former agricultural lands by regrading dikes, ditches, and swales; removing invasive and nuisance plants; and planting native trees.

## **Background**

This compensatory mitigation project would restore the native vegetation and hydrology of approximately 272 acres of former agricultural lands (i.e., farm fields) by removing dikes, ditches, swales, invasive and nuisance plants and planting native cypress trees. Compensatory mitigation is required by NPS as compensation for the temporal loss of wetland function associated with BOCI's NG3D seismic surveys conducted in 2017/2018. The compensatory mitigation is in accordance with the Findings of No Significant Impact (FONSI), the Wetland Statement of Findings (WSOF), NG3D Plan of Operations, and National Park Service (NPS) Director's Order # 77-1. A minimum requirement of one acre of restoration for every acre of impacted wetlands was determined appropriate since the impacted wetlands were considered to be lower in habitat uniqueness, function, and complexity relative to the long-term conditions of the restoration site. The seismic survey impacted 111 miles or 201.82 acres. BOCI has agreed to a modification of their permit that would require them to restore 272 acres of former agricultural fields if the modification is approved by NPS's Regional Director, 70.18 acres more than required by the original conditions of the permit.

The former agricultural fields (i.e., farm fields, compensation restoration site) are in the northwest corner of BICY in the Bear Island Unit. The site is located east of State Road 29 and north of the Bear Island access road (Figure 1). In the late 1970's, several areas totaling 272 acres were cleared for agriculture prior to the establishment of BICY. The farm fields were constructed with a system of perimeter dikes and ditches, and spreader swales. Previous vehicular access to

the farm fields was by several unimproved roads or trails. After a period of use, the farm fields were abandoned prior to 1984 and have been fallow for almost four decades.

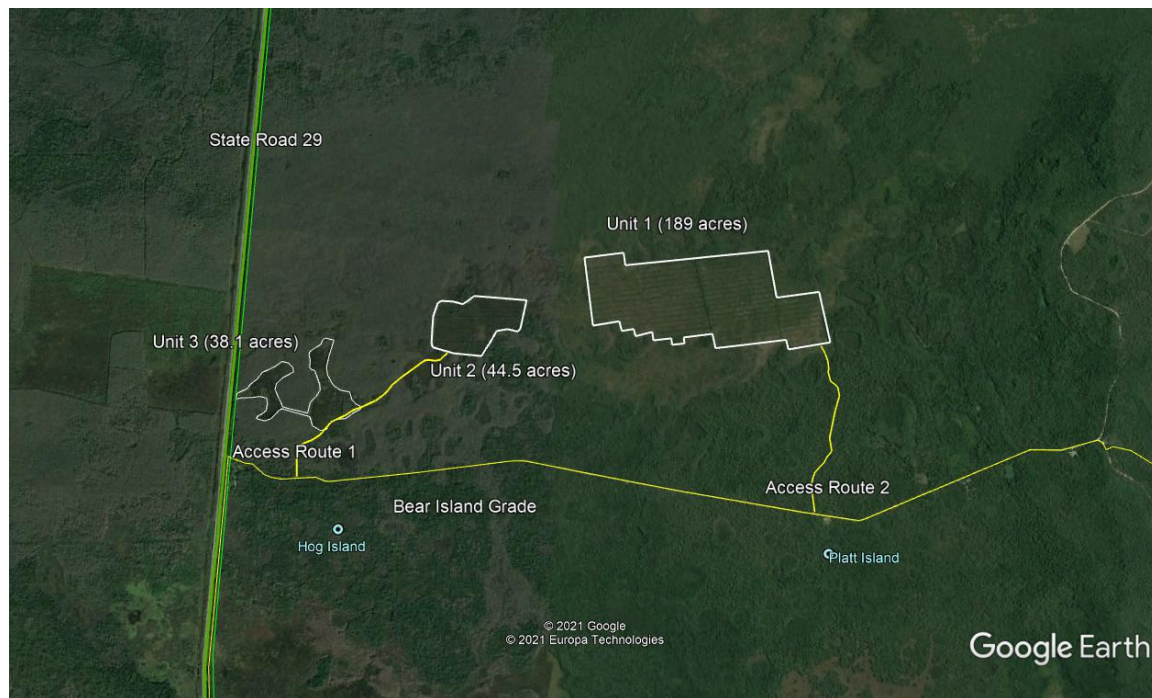


Figure 1

## Wetland Types and Functions

The former farm fields have disrupted natural processes, including hydrologic and vegetative connectivity. The dikes, ditches, and swales continue to impede and modify the flow of water across the landscape, resulting in wetland degradation. Though hydric soils exist at the site, desired native wetland plant species and composition are not present. Mature old-growth bald cypress make-up the dominant adjacent plant community typical of deep-water swamp communities. However, the disturbed substrate has allowed invasive and nuisance plant species to proliferate.

The project would restore native plant communities, primarily cypress, and hydrologic processes broadly from community to landscape scales. This project aims to reduce long-standing impacts to the connectivity of BICY's landscape. Ditches and swales will be restored by removing inappropriate vegetation, backfilling and degrading dikes to match the elevational grade of the surrounding wetlands.

The NPS has determined that the essential physical conditions are present at the restoration site and high-quality, pristine wetland systems surround the site. Thus, restoration is expected to facilitate recolonization of the plant and animal species typical of the surrounding habitats. Over time, the former farm fields, once restored, should develop qualities and functions similar to the original qualities and functions of the wetlands that were impacted by BOCI's seismic exploration surveys. The restored landscape should be seasonally flooded with no human structures such as roads, berms, or ditches affecting hydrology. The plant community should resemble the nearby deep-water swamp dominated by cypress and the surrounding graminoid and cordgrass marsh system. Seasonal flood waters should be able to move freely as sheet flow.

## **Compensatory Mitigation Approach**

Restoration activity would occur during the dry season. Degrading spoil banks would be accomplished using excavators or similar earthmoving equipment. Access to the restoration sites would be through two previously used access trails. Invasive plants, non-native plants and nuisance vegetation (cattail, etc.) would be treated after the completion of the hydrologic restoration.

Native vegetation restoration would include plantings of cypress trees. Trees would be planted randomly to mimic the natural spacing and density of the forested areas surrounding the impact sites. Natural recolonization of grass and sedge species would be allowed to occur. Control of invasive and nuisance plant species would be required for five years to ensure restoration of the natural plant community composition.

## **Tree Planting**

Approximately 200 lbs. of cypress seeds were collected by BICY staff and volunteers in fall/winter 2020. The seeds were provided to the State of Florida's Andrews Nursery for germination and sapling development. Bareroot cypress saplings will be ready in December 2021. They will be delivered to Naples Botanical Garden by NPS. The botanic garden will place the saplings in containers and store them in their greenhouses until the beginning of the wet season. The saplings would be ready to plant in May/June 2022 at the onset of the rainy season. Cypress saplings would be planted at 45 trees/acre (a total of 13,000 trees). The trees would also compensate for the 509 4-inch diameter at breast height (DBH) or greater cypress trees that were cut during the NG3D seismic surveys. Monitoring of cypress survival and growth would occur for four years post-tree planting.

## **Schedule and Time Frame for Construction**

The construction component of the restoration would begin at the start of the 2022 dry season. The dry season in south Florida is typically from January to May. Work would be completed prior to the onset of the wet season. In the event the work is not completed before weather conditions change, the work would be paused until the next dry season.

### **2021**

1. Complete compliance and obtain required permits.
  - a. The South Florida Water Management District issued an Environmental Resource General Permit to BICY on May 7, 2021 for the restoration (General Permit No. 11-105129-P).
  - b. NEPA and Section 106 Compliance is expected to be completed by September 2021.

### **2022**

1. Pre-construction, photo monitoring points will be taken in the cardinal directions from future monitoring plots.
2. Obtain the services of a contractor to conduct the hydrologic restoration of 272 acres of former agricultural lands including:
  - a. All trees and shrubs from the dikes, ditches and swales would be mechanically removed using an excavator or similar earthmoving equipment during the dry season (2022). The vegetation and the degraded spoil would be dispersed throughout the site or used to backfill ditches/swales. Vegetation would not be piled.

- b. Original surface hydrology in the disturbed wetland areas would be re-established by backfilling the ditches and swales using material from the dikes and surrounding area. Followed by grading the surface to natural ambient elevation.
  - c. Several small sections of dikes that are adjacent to hammocks would be left in place as these contain mature native trees (Figure 2).
3. Any remaining invasive plant species will be treated with herbicide via a contractor or in-house.
4. Plant approximately 13,000 cypress saplings from BICY seed sources. A contractor will be hired to plant the saplings and/or volunteers will be solicited to plant the cypress saplings.
5. Establish monitoring plots. Four to six 10 x 10m plots will be set up in each farm field to assess ground vegetation and shrub layers, along with monitoring cypress establishment and development (survival and growth). To evaluate graminoid and shrub recovery, species composition, percent cover and height will be recorded. To assess cypress establishment, trees will be tagged. Trees will be counted in subplots to monitor sapling survival, diameter at breast height (DBH) greater than 2 cm of trees and tree height by height classes will be recorded across the 10 m<sup>2</sup> plots.
6. During year 1 surveys, post-construction photo monitoring points will be taken at each monitoring plot. For years 2-5, photo monitoring points will be taken during survey periods at monitoring plots.



## **2022-2026**

Annual monitoring will start during 2022 and nuisance and invasive plant control as required.

### **Anticipated Time-Frame For Full Functioning Of The Compensation Wetlands**

The naturally-recruited herbaceous plant community should reach full coverage in a few years. Cypress trees, however, are much slower growing. They can grow several feet in ideal conditions in the first year, but rarely increase in height by more than twelve inches per year after that. Any environmental stresses such as excessive flooding or drought can slow growth rates. Cypress typically do not start to produce cones until they reach roughly twenty years of age. Therefore, we can expect roughly several decades to pass before the tree community reaches a minimum sexual maturity and can start to reproduce additional saplings. Growing at roughly one foot per year, planted trees would not reach a similar height as the surrounding forest for more than fifty years.

### **Performance Standards and Monitoring**

A minimum of two years is anticipated for herbaceous cover to recolonize the restoration sites with cover and biomass similar to natural surroundings. Cover of 75% native, non-woody species would be expected after one year and 90% after two years and for the remainder of the monitoring period. Four to six 10 x 10m plots will be set up in each farm field for ground vegetation, shrub, and cypress recovery evaluation. Species composition, percent cover and shrub height will be evaluated in three randomly selected subplots and (3) 1m<sup>2</sup> quadrats in three randomly selected subplots will be used to assess ground cover in each 10m<sup>2</sup> plot. These monitoring plots will assess the spatial variation across and within the farm fields, along with evaluating this variation temporally.

Trees take many years to reach a fully functional level. Most bald cypress take twenty years at a minimum to start reproducing. Within the same 10m<sup>2</sup> monitoring plots described above, cypress' survival, DBH of trees 2 cm in diameter, and height measured in height classes will be evaluated to assess the survival and growth of planted cypress. Trees will be counted in subplots to monitor sapling survival. Trees will be initially tagged during monitoring plot set up to assist with tree assessment across the five years. Trees are very slow growing in this wetland landscape. Any increases in height or DBH would indicate growth. At least 50% of planted trees need to survive through year five post-planting.

Monitoring of the restoration project would occur for five years (starting in 2022) to verify that the restoration project meets its identified restoration objectives, or whether corrective action(s) would be necessary to achieve, facilitate or eliminate obstacles to restoration success. The following criteria, parameters for measurement, methods and timing would be used to monitor the success of the restoration project:

1. Elevation transects would be established extending across dikes, ditches and swales 50 meters into adjacent wetlands prior to commencement of restoration work. Transects would be sampled pre-restoration, post-restoration (prior to planting) and annually for a period of four years thereafter (e.g., 2022-2026). A surveying level will be used to determine elevation measurements at random locations throughout the monitoring timeframe. These measurements will be used to assess that the restoration area was returned to the natural gradient of the swamp.
2. Documentation of species composition and percent cover of the vegetation community via monitoring plots would be used to compare sites within the project area to adjacent reference sites. This would assess the degree of change over time from baseline values, along with providing invasive/nuisance plant cover information. Survival and growth metrics of planted cypress trees would also be determined.

3. Photos at each monitoring plot/point from cardinal directions would be used as a tool for documenting the engineering, hydrologic and botanical aspects of the restoration across time.
4. Annual detailed monitoring reports would be created by BICY. The first report would include conditions at time zero, prior to restoration activities, along with post-restoration conditions. Monitoring reports would include survey data, descriptive vegetative statistics, and corresponding site photographs.

## **Contingency Actions**

Immediately after restoration construction grading is complete the grades will be surveyed to determine that elevations have been established that reflect the surrounding surface elevations. Any areas that are determined to be eight inches or greater above or below the average surrounding undisturbed elevations will be regraded to within the eight-inch threshold.

The BICY staff will verify that the threshold of 75% percent cover of native non-woody plants (after one year after seeding or planting) has been achieved. If native non-woody plants do not cover at least 75% of the ground surface of the entire restoration area within the first year of growth, or if the native plant cover does not reach 90% after the second year of growth, then open areas will be planted with native seedlings and/or non-native plants will be removed and replaced with native seedlings to achieve percent-cover targets.

If the fifth-year monitoring report shows that less than 50% of the planted cypress seedlings (less than 6,500 seedlings) survived, then new seedlings will be planted in an amount that will bring the number of planted and survived seedlings up to 6,500.

## **Funding**

BOCI will hire a third-party contractor to perform the hydrologic restoration during the 2022 dry season (January - May). The cost of the restoration is estimated at \$300,000. In addition, BOCI will provide funding for invasive plant control, cypress planting, any contingency actions (if necessary as determined by BICY) and a NPS term employee for five years. The costs will be approximately \$40k/year which would be reimbursed to the NPS/BICY annually by BOCI.

Recommended: \_\_\_\_\_  
Superintendent, Big Cypress National Preserve

Concurred: \_\_\_\_\_  
Chief, Water Resources Division

Approved: \_\_\_\_\_  
Regional Director, Southeast Region