Compensatory Mitigation Plan Revision
to the
Wetland Statement of Findings for the
Burnett Oil Co., Inc.
Nobles Grade 3D Seismic Survey
Big Cypress National Preserve

December 2022

Recommended: THOMAS FORSYTH Digitally signed by THOMAS FORSYTH Date: 2022.12.14 12:54:05 -05'00'

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Regional Director, Interior Region 2, South Atlantic-Gulf

Introduction

On May 10, 2016, the National Park Service (NPS) conditionally approved a Plan of Operations (9B permit) for the Nobles Grade 3D (NG3D) Seismic Survey pursuant to 36 CFR § 9.37(b)(2) (under NPS Nonfederal Oil and Gas Rights Regulations superseded December 5, 2016) and subject to the wetlands compensation mitigation requirements outlined in the Wetland Statement of Findings (WSOF) attached to the Finding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 (FONSI) 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. (Burnett) 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, and, to compensate for the temporal loss of wetland functions, Burnett 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 Burnett's NG3D Seismic Survey operations in 2017 and 2018 resulted in 111 miles of impact, or 201.82 acres, that require compensation. However, NPS staff have also determined that the ORV impact restoration identified in the 2016 WSOF will 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, NPS proposes to modify Burnett's 9B permit pursuant to 36 CFR § 9.150(b), and instead require that Burnett restore hydrology and native plant communities on approximately 272 acres of former agricultural lands.

Background

This compensatory mitigation project will restore hydrology and native vegetation on approximately 272 acres of former agricultural lands (i.e., farm fields) by regrading swales, dikes, and ditches; removing 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 Burnett's NG3D Seismic Survey conducted in 2017/2018. The compensatory mitigation is in accordance with the FONSI, WSOF, and 9B permit for the NG3D Seismic Survey, as well as NPS Director's Order # 77-1: Wetland Protection and its accompanying procedural manual. The NG3D Seismic Survey impacted 111 miles of seismic lines in BICY wetlands, or 201.82 acres. Burnett has agreed to a modification of their permit that will 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 to be restored as compensation 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 spreader swales and a system of perimeter dikes and ditches. 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.

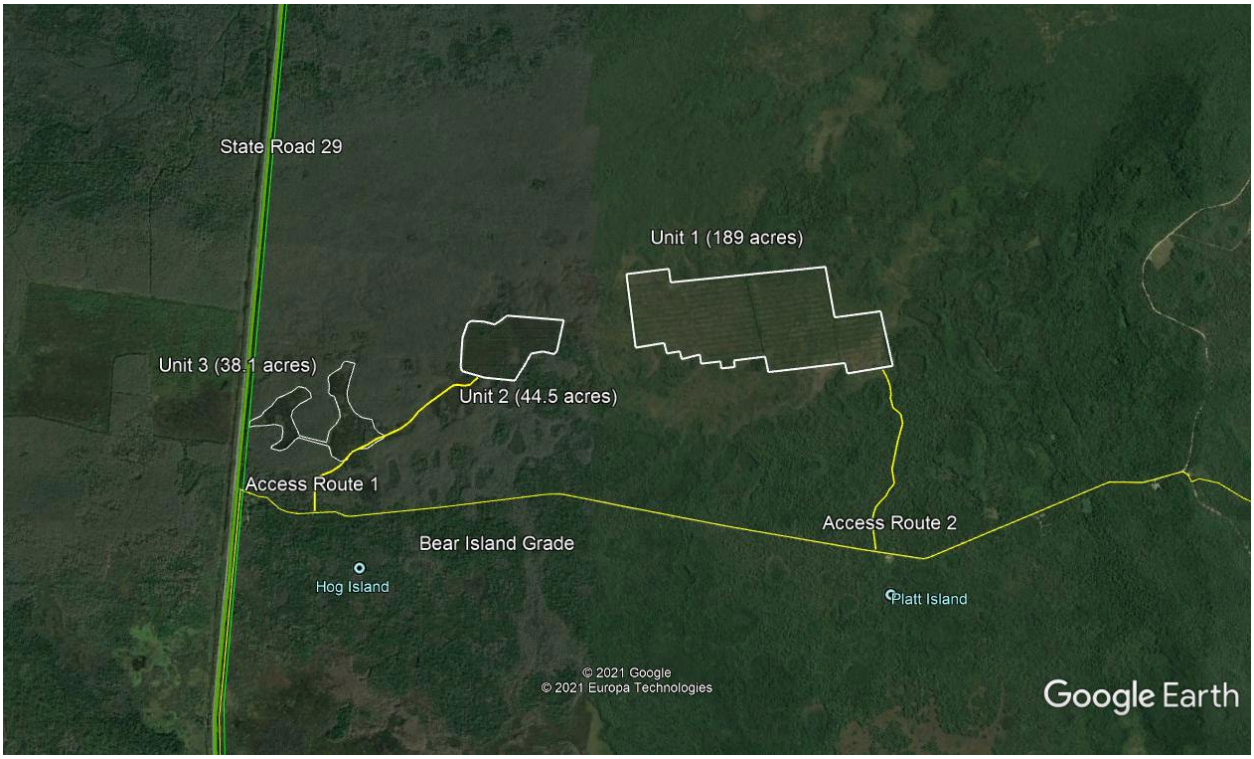

Figure 1

Wetland Types and Functions

The former farm fields have disrupted natural processes, including hydrologic and vegetative connectivity. The swales, dikes, and ditches 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.

NPS has determined that the essential physical conditions for restoration are present at the 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 Burnett's seismic exploration surveys. The restored landscape should be seasonally flooded with no human structures such as roads, swales, dikes, 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 will occur during the dry season. Degrading spoil banks will be accomplished using excavators or similar earthmoving equipment. Access to the restoration sites will be through two previously used access roads, along which some clearing may be required. Invasive plants, non-native

plants and nuisance vegetation (cattail, etc.) will be treated after the completion of the hydrologic restoration.

Native vegetation restoration will include plantings of cypress trees. Natural recolonization of grass and sedge species is expected to occur. Monitoring and control of invasive and nuisance plant species will be required at time zero and for five years to ensure restoration of the natural plant community composition.

Tree Planting

Burnett will contract collection of cypress seeds from BICY as well as germination and growth to saplings by a nursery. Burnett will also contract planting at the onset of the rainy season. A total of 13,000 cypress saplings will be planted based on a design to be developed by the planting contractor with input from and approval by NPS. Trees will be planted randomly to mimic the natural spacing and density of the forested areas surrounding the impact sites and with consideration of the existing mosaic native woody plant community distribution within the former agricultural fields. The trees will also compensate for the 509 4-inch diameter at breast height (DBH) or greater cypress trees that were cut during the NG3D seismic survey. Monitoring of cypress survival and growth will occur at time zero and for five years post-tree planting.

Schedule and Time Frame for Construction

The construction component of the restoration will begin at the start of the 2023 dry season. The dry season in south Florida is typically from January through May. Work will be completed prior to the onset of the wet season. In the event the work is not completed before weather conditions change, the work will be paused until the next dry season.

2023

1. Cypress seed collection and germination/grow out.
2. Identify monitoring plot locations. Take photos from pre-construction photo monitoring points in the cardinal directions from future monitoring plots. Establish elevation transects.
3. Conduct hydrologic restoration of 272 acres of former agricultural lands including:
    a. Trees and shrubs from the existing swales, dikes, and ditches, except as noted in c. below, will be mechanically removed using an excavator or similar earthmoving equipment during the dry season. The vegetation and the degraded spoil will be dispersed throughout the site or used to backfill ditches/swales. Vegetation will not be piled.
    b. Original surface hydrology in the disturbed wetland areas will be re-established by backfilling the ditches and swales using material from the dikes and surrounding area, followed by grading the surface to match prevailing adjacent elevations.
    c. Several small sections of dikes that are adjacent to hammocks will be left in place as these contain mature native trees (Figure 2).
4. Treat remaining invasive plant species with herbicide.
5. Plant approximately 13,000 cypress saplings from BICY seed sources.
6. Establish monitoring plots. 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); therefore, monitoring plot selection will need to be coordinated with the cypress tree planting design. 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 - DBH greater than 2 cm of trees and tree height by height classes will be recorded across the 10 m^2 plots. Two similar 10 x 10m plots will be established as reference sites in adjacent, undisturbed wetlands.

7. During year zero surveys, post-construction photo monitoring points will be taken at each monitoring plot. For years 1-5, photo monitoring points will be taken during survey periods at monitoring plots.

Figure 2

2023-2028

Annual monitoring will start during 2023 and nuisance and invasive plant control as required.

Anticipated Timeframe 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 at BICY. 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 expect roughly two 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 are not expected to reach a similar height to 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 is 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) $1m^2$ quadrats in three randomly selected subplots will be used to assess ground cover in each $10m^2$ 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 $10m^2$ 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 will indicate growth. At least 50% of planted trees need to survive through year five post-planting.

Monitoring of the restoration project will occur at time zero and for five years (starting in 2023) to verify that the restoration project meets its identified restoration objectives, or whether corrective action(s) will be necessary to achieve, facilitate, or eliminate obstacles to restoration success. The following criteria, parameters for measurement, methods and timing will be used to monitor the success of the restoration project:

1. Elevation transects will be established extending across dikes, ditches and swales 50 meters into adjacent wetlands prior to commencement of restoration work. Transects will be sampled post-restoration, prior to planting. 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 will be used to compare sites within the project area to adjacent reference sites. This will 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 will also be determined.
3. Photos at each vegetation monitoring plot/point from cardinal directions will be used as a tool for documenting the engineering, hydrologic, and botanical aspects of the restoration across time.
4. Annual detailed monitoring reports will be submitted to and approved by BICY. The first report will include conditions at time zero, prior to restoration activities, along with post-restoration conditions. Monitoring reports will include survey data, descriptive vegetative statistics, and corresponding site photographs.

Contingency Actions

Immediately after grading is complete, the elevation transects will be surveyed to determine that elevations have been established that match the adjacent surface elevations on both the interior and exterior edges of the graded area. Any areas that are determined to be more than three inches above or below the adjacent undisturbed elevations will be regraded to within the three-inch threshold. The slope of the graded area will match any natural elevation differences between undisturbed lands on the interior and exterior of the graded areas. Transitions from graded areas to adjacent natural elevations will be smooth and free from escarpments.

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 saplings (less than 6,500 saplings) survived, then new saplings will be planted in an amount that will bring the number of planted and survived saplings up to 6,500.

Funding

Burnett will hire a third-party contractor to perform the hydrologic restoration during the 2023 dry season (typically January - May). The cost of the hydrologic restoration is estimated at $500,000. In addition, Burnett will provide funding for invasive plant control, cypress planting, any contingency actions as necessary to meet permit conditions, and a NPS employee for five years. The employee costs are expected to be approximately $40k/year which will be reimbursed to NPS/BICY annually by Burnett.