

Littoral Marsh Enhancement

Northwest Marsh and Burnt Bridge / Lake Okeechobee

Background Information: Lake Okeechobee is the largest freshwater lake in the state of Florida. It is the ninth largest natural freshwater lake in the United States and the second largest natural freshwater lake contained entirely within the contiguous United States. Okeechobee covers 730 square miles (468,000 acres) and is exceptionally shallow for a lake of its size, with an average depth of only 9 feet. The lake is divided between Glades, Okeechobee, Martin, Palm Beach, and Hendry counties.

Water level fluctuations that control littoral marsh health in Lake Okeechobee have changed over time due to impoundment for water supply and flood control. Prior to impoundment, water levels fluctuated between 10 and 18.5 feet NGVD with very large horizontal expansion that allowed the littoral marsh to expand outside of the confines of the levee that exist today. In addition to littoral marsh expansion, the organic sediments currently confined within the levee boundary were transported horizontally within the lake floodplain. These flooding events moved nutrient-rich organic sediments out of the lake basin where they would later be oxidized. Post-impoundment management has resulted in water levels most frequently stabilized between 13 and 17 feet NGVD with rare low-water events to 9 feet and rare high-water events to 18.25 feet. Water levels fluctuating within the confinement of the levees have resulted in vertical movement of water, but restricted horizontal transport of nutrient-rich organic sediments which have led to the development of internal organic berms. Hurricanes that track near the lake cause organic material to build new berms within the confines of the levee that have to be mechanically removed or altered.

Northwest Marsh Berm

This project is located in the northwest marsh of Lake Okeechobee. In September 2017, Hurricane Irma ripped up cattail, other emergent plants, and associated organic sediments and deposited the material at the lakeward edge of the cattail wall located on the back side of the 2001 scraping project. This newly formed organic berm, if allowed to continue to grow, will lead to a hydrologic disconnect between the open water of the lake, and the inner marsh. The proposed project will create a 70-acre opening in front of the cattail wall, along the organic berm. A series of cuts and flowways will extend from the berm, adding a research component to the project. We will evaluate which cut, or series of cuts, will better aid in future maintenance of this organic berm.

Project Objective: The objective of this project is to shred 70-acres of organic berm in the northwest marsh. By using four different opening techniques along the berm, we can evaluate what technique will best disperse the shredded organic berm (Figure 1). This project is necessary to develop a mechanism that will allow for maintenance of the 2001 scrape project. If this project is successful, we may use these management strategies in other locations along the northwest marsh where the organic berm has formed. If these techniques do not work, then lake the lake will need to be low enough (likely under 10 feet) to bring heavy equipment into the site to mechanically remove the built-up organics. The project area will be allowed to naturally recolonize with native vegetation.

Methods: Operations- Mechanical shredders will be used to break up the organic berm, floating tussock, and vegetation the project area. Four treatment methods will be evaluated to determine which

method allows the organic berm material to disperse the best. Each method will be evaluated by recording sediments depths along a transect within each area. Sediment depths will be evaluated prior to shredding, immediately after shredding and on a regular basis until no additional changes in depths are recorded. A control area along a portion of the berm not being removed will also be evaluated.

1. One cut will extend from the organic berm towards the lake.
2. One semi-circular cut will extend from the organic berm towards the cattail wall (towards the levee).
3. One cut extending from the organic berm towards the lake with an additional semi-circular cut on the opposite side extending from the organic berm towards the cattail wall.
4. No additional cuts, just the berm will be shredded.

The shredding operation will consist of an initial cut of the entire project area. After 2-5 weeks, a follow-up cut will be performed. This second cut will shred the material to a finer consistency and allow for easier movement of shredded material by wave energy.

The project area flowways will be opened to the southeast to take full advantage of southeastern prevailing summer-fall winds to maximize wind and wave energy through the site.

Northwest Marsh Project Site



Burnt-Out Bridge Cattail and Phragmites Management

This project area lies between Kreamer and Torry Islands in the south end of Lake Okeechobee and is approximately 134 acres (Figure 2). Over time, this area has become thick and overgrown with cattail, Carolina willow, and *Phragmites* reducing its value to fish and wildlife, hunters, fisherman, birdwatchers, and boaters alike. The project area extends from the Burn-Out Bridge area northwest to the open water of the lake.

Project Objective: The objective of this project is to create a 134 acre open water/bulrush marsh to the northwest of the Burnt-Out Bridge area that will reestablish water flow between Pelican Bay and South Bay. Ecologically, the marsh is expected to naturally recolonize with spike rush, eelgrass and pondweed. The marsh is expected to obtain <10% recolonization after 12 months due to the time necessary for flushing of organic material. Expectations of recolonization should exceed 25% by 24 months. Depending on flow rates there may also be some establishment of other SAV components but this should make up less than 10% of the total open water areas.

Methods:

Phase 1 - The first phase is to aerially treat the cattail in the project area with Clearcast (imazamox). This chemical is very effective at killing the cattail but leaving desirable aquatic vegetation such as bulrush, spike rush, lily pads and other rushes. Bulrush is very prevalent in the project area.

Phase 2 - Three months post-herbicide treatment, the cattail should be browned and fallen over and ready to receive a prescribed burn. This phase will only be completed if atmospheric conditions are conducive to burning.

Phase 3 – Post-burn spot herbicide treatments will be conducted using various herbicides. Herbicides will be determined based on target species within the area. Application will be executed via airboat as determined by monthly monitoring events.

Phase 4 - Post secondary herbicide treatment monitoring will determine whether shredding should be considered. Shredding of this material is expected to facilitate removal of mud tussocks and other organic material that is associated with tussocks that are within the treatment area.

The project area will open to the northwest to utilize winter and early spring prevailing winds and wave energy to maintain this opening and the vegetation communities that recolonize the project site. Commission staff will conduct water quality monitoring (dissolved oxygen, turbidity, pH) and on-site observation (measurement of organic material depth within project site, % occurrence of vegetation species within project site) to determine success and make future maintenance management decisions on the site.

Burnt-Out Bridge Project Site





Figure 1. – Proposed treatment area of the Northwest Marsh (70 acres). Project is expected to disperse the organic material.

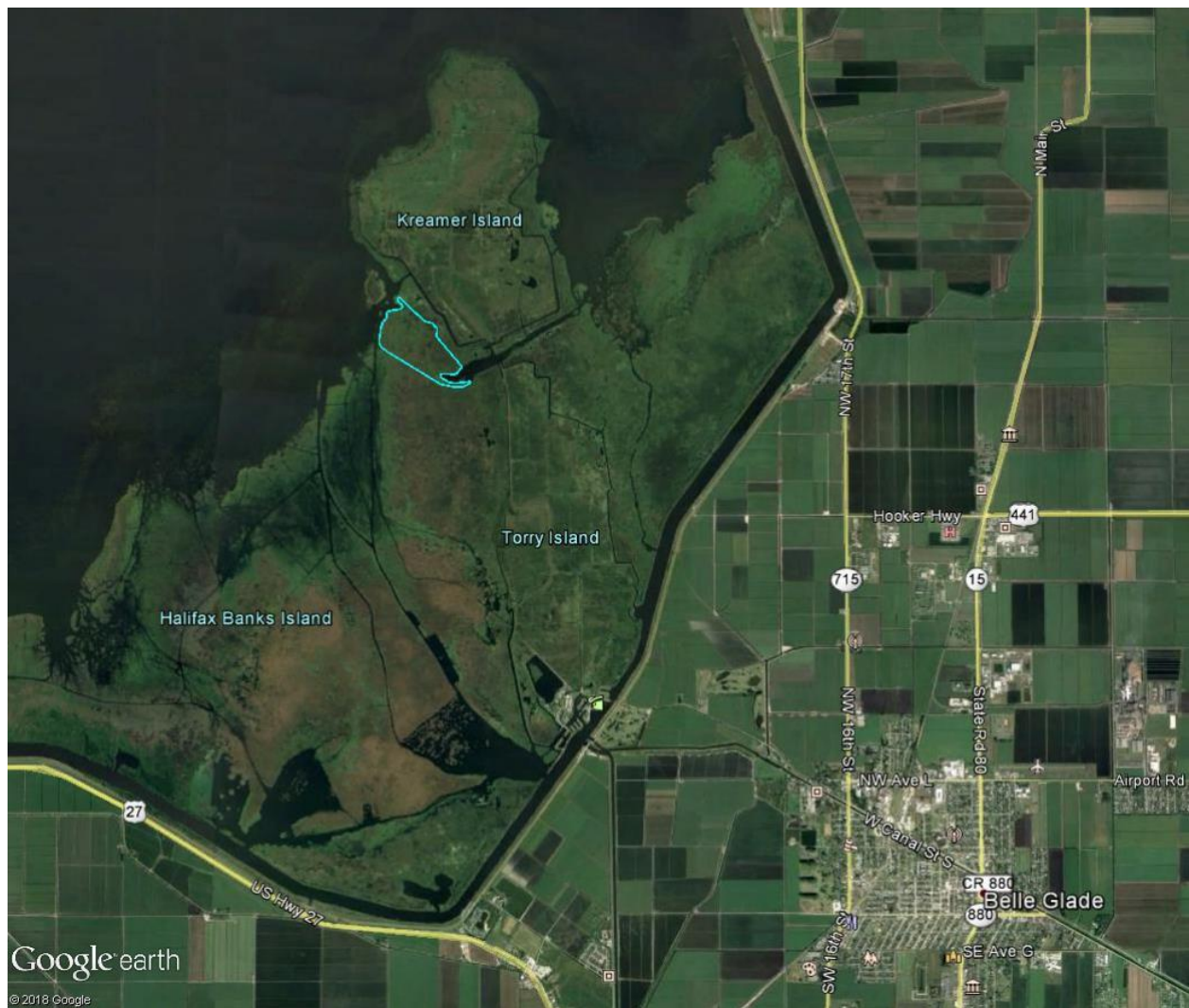


Figure 2.- Proposed treatment area of the Burnt-Out Bridge area (134 acres). Project is expected to enhance the littoral marsh west of the Burnt Bridge area by recolonization of native emergent and submersed species and restore flow-ways for wave energy through the Burnt Bridge area.

Lake Okeechobee Dyess Ditch Marsh Flow-Way

Background Information:

Due to high water levels on Lake Okeechobee the past few years, many species of vegetation have declined. Conversely, lily (*Nymphaea*) and cattail (*Typha*) species, have increased, oftentimes being the only species present in certain areas of the lake. Local stakeholders have approached FWC about habitat enhancement projects that include opening up sections within select areas with the objective of creating habitat diversity and increasing the amount of edge available for anglers. These projects were introduced for areas near Dyess Ditch and within Pelican Bay. Bryan Honnerlaw and Asa Godsey (public

stakeholders) have promoted the Dyess Ditch marsh project for the past year. Jeff McMillan and Asa Godsey have promoted the Pelican Bay project (not discussed in this proposal). On August 3, 2018 FWC met again with public stakeholders on site, to further refine and finalize the Dyess Ditch Marsh project. The area east of Dyess Ditch primarily consists of two distinct communities. The northern community consists of lily with little cattail. The southern community (adjacent to Fisheating Bay) consists primarily of cattail. Large sections of thick cattail is difficult for many types of wildlife to use. Historically, it is believed that this area had a lot of spikerush (likely in lower water years) and there was little or no cattail wall. The cattail wall is a fairly recent addition to this area. Stakeholders would like to replicate historical conditions and create areas that are better for angling and wildlife. Stakeholders feel that lack of water movement in the areas within and behind the cattail is contributing to the poor water quality (turbid water, high amounts of muck, low dissolved oxygen) within the lilies and also preventing other species from occurring in these areas.

Project Objective:

A 238 acre open water pocket will be created within the cattail that extends to the edge of the lilies and create two openings through the cattail to Fisheating Bay (Figure 3). This is expected to allow the circulation of some water through the newly opened area. Due to the size of the area, wind patterns are also expected to help circulate water. Water movement is expected to help move water within the lilies to the north. A 200-300 foot edge would still remain between Fisheating Bay and the newly opened area. During low water, having other species, such as spikerush or SAV, come up in these areas would be ideal. During higher water, clumps of cattail or bulrush may begin to create small patches within this opening. Anglers will be able to fish along the newly created edges, ducks will have an area to land adjacent to the lilies and snail kites are expected to nest in the cattail and forage in the new opening. Secretive marsh birds will still have many acres of cattail to the east of the newly created opening to use. Like other created openings on the lake, this area will be allowed to naturally fill in and go through various successional stages. This area may eventually be treated again in the future if cattail again becomes too thick.

Plan of Action:

1. Cattail will be treated with Clearcast at a rate of 32 oz/a via aerial application. Clearcast at these rates is fairly selective and should not kill any other species within the treatment area other than cattail. This 238 acre area will include a 235 foot opening to Fisheating Bay in the west and a 209 foot opening in the east.
2. At least 3 months after herbicide treatment of the cattail, once cattail has browned and fallen over, prescribed fire will be used to reduce the organic material falling to the bottom. Adjacent green cattail may also burn, allowing the clearing of dead thatch.

Timing:

A mid-October herbicide treatment would be preferred to avoid interfering with the regular waterfowl season which begins November 17th. Prescribed fire may occur sometime during the winter months. Whether a fire occurs during hunting season or not, thick cattail is unlikely to be used by waterfowl hunters and provide little impact.

Monitoring:

Monitoring stations will be set up within the treatment area, within the lily area and within Fisheating Bay to detect any changes caused by this treatment. Water quality (dissolved oxygen, turbidity, pH) will be taken before treatment, after treatment and every month after treatment (when possible) until no detectable changes occur in any of the areas. Water samples will be collected to test for changes in nutrient levels. Photopoints will also be taken during these times.



Facing north from Fisheating Bay into cattail wall.



Figure 3 – Dyess Ditch Marsh 238 acre herbicide treatment area north of Fisheating Bay.