LAKE RUTH SHORELINE VEGETATION MANAGEMENT PLAN
HIGHLANDS RESERVE DEVELOPMENT
HIGHLANDS COUNTY, FLORIDA

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1.0 INTRODUCTION

Southwest Florida Water Management District (SWFWMD) previously issued Environmental Resource Permit number 44021800.006 for this project to allow for the construction of a surface water management system to serve the proposed residential development Highlands County, FL.

2.0 PROJECT DESCRIPTION

The Highland Lakes Reserve Development is located on the north side of SR 66, approximately 2.5 miles west of US 27, Highlands County, FL. Lakes Ruth and Charlotte are centrally located in the development.

This plan has been developed to obtain approval from SWFWMD and to provide guidance to the Property Owners Association to address routine maintenance of Lake Ruth's shoreline.

The goal of this plan is to provide guidelines to the property owners in the preservation, enhancement, and management of the shoreline for Lake Ruth. The shoreline is part of the previously established mitigation for the development with a conservation easement placed at the time of permit approval to protect this resource. As individual lots have been developed the homeowners have expressed a need clear vegetation within this shoreline area for aesthetics and lake access. This plan will provide a balance in preserving this habitat and providing a useful area for the lot owners to enjoy as part of the development.

3.0 OBSERVED CONDITIONS

Assessment of the shore has identified a littoral shelf that includes cow lily (*Nuphar advena*) and a dominance of primrose willow (*Ludwigia peruviana*) and Cuban bullrush (*Oxycarum cubense)*. This vegetation has created dense floating mats of vegetation that extend from the shoreline an average of 75-feet, and as much as 175-feet along the north shore. The buffer landward of the shoreline includes woody vegetation such as slash pine (*Pinus elliottii*), swamp bay (*Persea palustris*), wax myrtle (*Myrica cerifera*), swamp fern, water oak (*Quercus nigra*) and grapevine (*Vitus rotundifolia*). See Photos.

Overall, the lake appears to be functioning properly, however the dense littoral mats that have emerged include exotic and nuisance vegetation such as the primrose willow and Cuban bullrush. The mats are rooted and after years of detritus accumulation have created thick, dense weedy areas that prevent access to the lake.

The buffer includes mature trees and a dense shrub layer that includes nuisance vegetation (wax myrtle and grapevine) that has created a dense buffer that prevents access to the shoreline and views of the lake. A current aerial of the lake shows the extent of the shoreline and buffer vegetation (Figure 1).

4.0 HISTORIC CONDITIONS

Prior to the development and as recent as 1994 the shoreline along Lake Ruth was different than current conditions. Review of historical aerials (Figure 2) show that the shoreline did not have the large littoral mats noted in the current conditions. The wooded buffer is evident but does not appear to be as mature or as dense from these aerials.

A measurement of the lake surface area in 1994 indicates that the lake was approximately 75.0 acres, with the 2017 aerial being 66.3 acres. This is a reduction of an estimated 8.4 acres of surface waters or 11-percent over 23 years. The aerials do not show a reliable way to measure the changes in the buffer, however, based on recent observations it is assumed that this area too has changed with denser vegetation than prior to the development.

The biggest threat to the lake appears to be from the introduction of the exotic vegetation (primrose willow) establishing the littoral floating mats.

Based on the observed conditions, and the historic aerials of the lake, management of the lake shoreline would be an enhancement to the lake and would ultimately meet the goals of the SWFWMD permit by having an enhance and functioning lake and buffer.

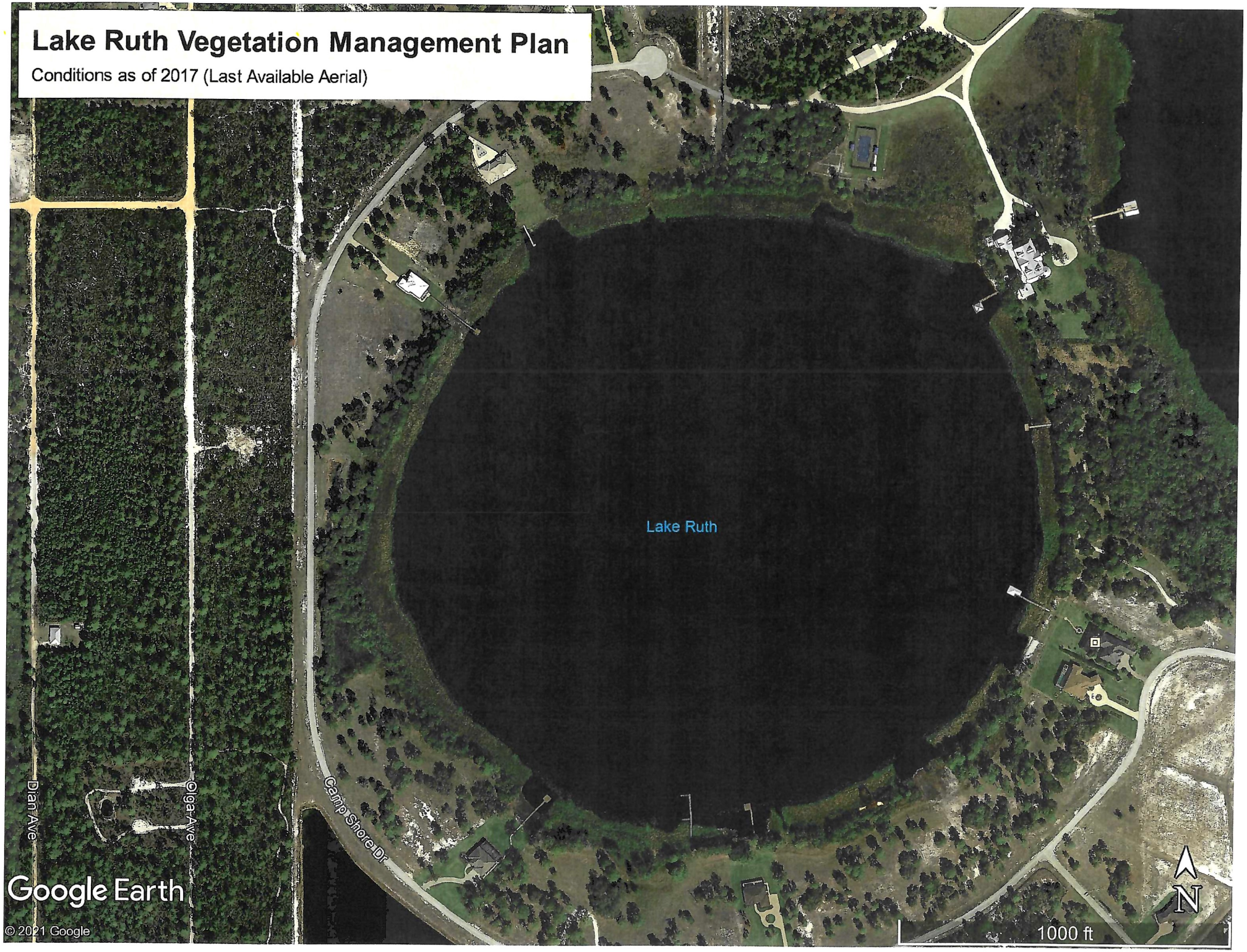
5.0 MANAGEMENT PLAN

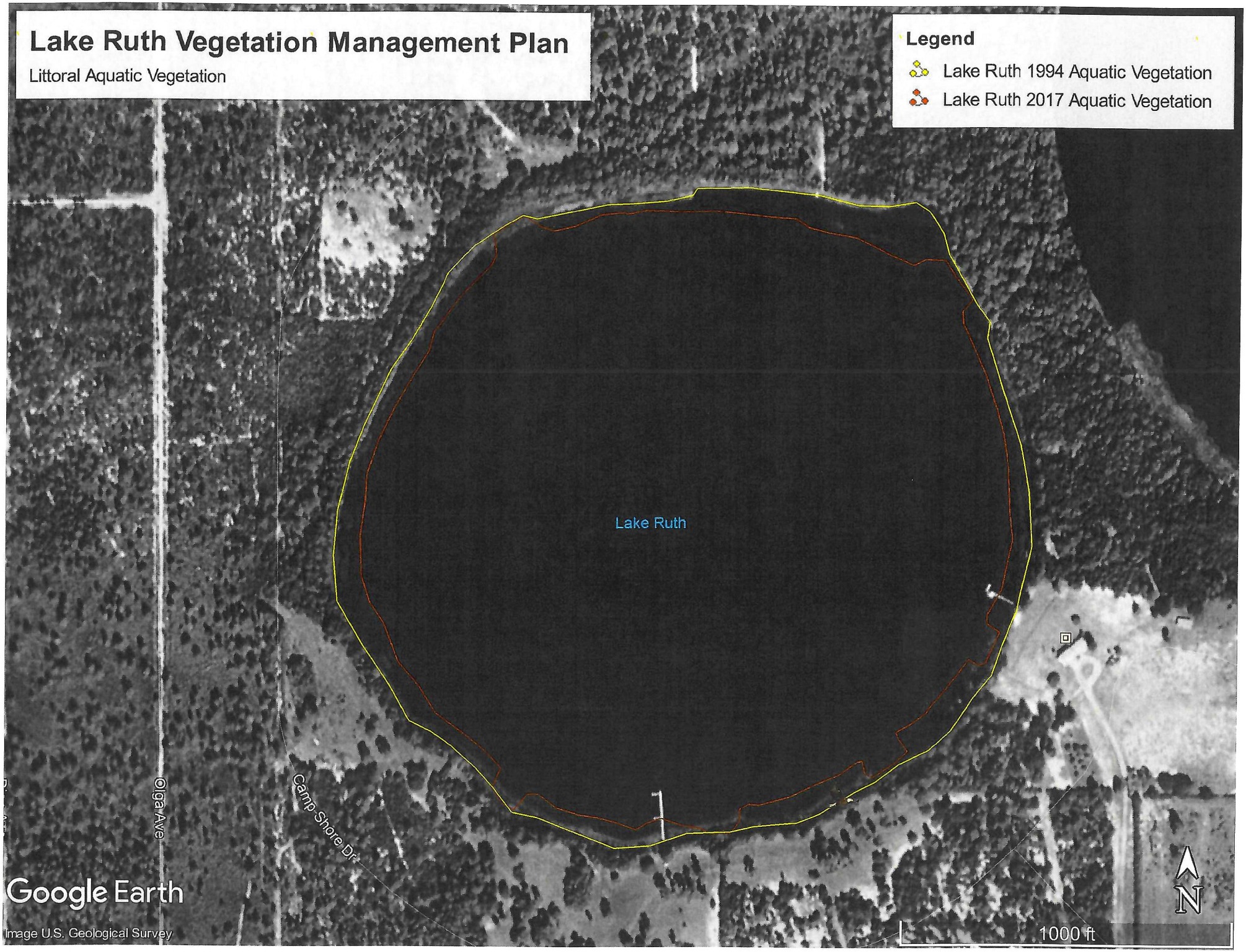
The purpose of this management plan is to enhance water quality while minimizing nutrient loading through vegetation management. Exotic and nuisance plants can be detrimental to the lake's ecology. If left to continue to grow without management these plants could impair the function of the lake and surrounding buffer. Vegetation management can be used to reduce and remove the undesirable vegetation and improve the quality of the habitat. This management plan includes manual, mechanical, and herbicide control. The combination of these methods is anticipated to provide long term management and preserve the function of the lake.

Management of the lake will be the responsibility of the Property Owners Association (POA) with each property owner addressing the eradication of their individual property. Individual property owners will be required to get local local approval through their POA to confirm that their planned eradication program is consistent with this plan.

Lake Ruth Vegetation Management Plan

Conditions as of 2017 (Last Available Aerial)




Lake Ruth Vegetation Management Plan
Littoral Aquatic Vegetation
Legend
Lake Ruth 1994 Aquatic Vegetation
Lake Ruth 2017 Aquatic Vegetation
Lake Ruth
Olga Ave
Camp Shore Dr
Google Earth
Image U.S. Geological Survey
N
1000 ft

The manual or mechanical control will consist of limited clearing along the buffer of each residential lot to remove trees less than 4-inches in diameter, and removal of wax myrtle shrubs and grapevines to allow for a visual view window of approximately 50% or 50 feet (whichever is less) of the linear shoreline of each lot. All trees 4 inches or greater will remain and be protected from disturbance. Removal of debris may be by manual or mechanical means so long as necessary controls are installed for silt and sediment management and water quality is maintained in compliance with State and Federal standards. Only low ground pressure equipment may be utilized for work within the buffer. Elevations and slopes shall be restored to the condition prior to the commencement of work if impacted. In certain areas it may be more feasible to remove all vegetation due to the density of exotic and invasive species. These areas shall be revegetated as soon as possible.

When accompanied by a Florida Fish and Wildlife Conservation Commission Aquatic Plant Management permit, an access corridor is permitted to remain free of all vegetation. Where possible, it is recommended a buffer be placed such that any runoff from uplands is directed to vegetated areas for nutrient reduction. Existing native ground cover will be left in place and enhanced by the planting of Florida native species.

This assumes a total of 140 plants per lot selected from the following list of plants.

- Sand cordgrass (*Spartina bakeri*), 4 inch liner, 3 foot on center
- Cinnamon fern (*Osmunda cinnamomea*), 1 gallon, 3 foot on center
- Canna lily (*Canna flaccida*), bare root, 3 foot on center
- Southern blueflag (*Iris virginica*), bare root, 3 foot on center

The lake littoral will be enhanced by the mechanical/hand labor removal of exotic vegetation and the floating mats. This activity is exempt from FWC permits based on 68F-20.0035 (1)(d) and (e) (see attached Appendix). This material will be removed and disposed of offsite within an approved landfill. Removal is recommended by a contractor familiar with this type of service. Debris floating after removal will be raked and removed from the waterbody. Herbicides may be used to reduce the floating mats however great care must be taken to minimize negative impacts to dissolved oxygen.

After removal or chemical control of the floating mats, littoral planting will be required. The following species will be planted for each shoreline. Approximately 50% or 50 feet of the shoreline (which ever is less) of each lot can remain unplanted to allow for an access corridor to the lake. The remaining area will be planted from the water line down to no more than 2 feet in depth with Florida native species. This area will vary in size based on the lot, but it is assumed that for every 25 feet of shoreline enhanced approximately 62 plants from the following list will be selected.

- Pickeralweed (*Pontedaria cordata*), bare root, 2 feet on center
- Duck potato (*Sagitarria spp.*), bare root, 2 feet on center
- Soft Rush (*Juncus effusus*), bare root, 2 feet on center
- Fireflag (*Thalia geniculata*), bare root, 2 feet on center

Survival of plants in both the buffer and littoral shoreline areas will be no less than 80-percent. Availability of plants may require substitution with Florida natives only. The property owners are responsible for survival of plantings, answering to the Property Owners Association who will be the responsible entity with the SFWMD for compliance of this document and the permit.

6.0 MAINTENANCE OF ENHANCED AREAS

A maintenance program will be initiated to keep nuisance and exotic vegetation at less than 5% coverage. Exotics will be maintained by a licensed herbicide applicator with herbaceous vegetation sprayed with the appropriate herbicide and the woody vegetation cut, sprayed and materials removed from the buffer and discarded within an approved land fill.

Herbicide will be sprayed in accordance with manufacturers recommendations and will not be used on the open water areas.

Maintenance will be conducted on an as need basis such that none of the enhanced areas can have more than 5% exotic or nuisance vegetation at a given time. Each lot owner will be responsible for treatment of their respective lot.

PHOTOGRAPHS

Shoreline Buffer

Littoral Mats

APPENDIX

68F-20.0035 Waters or Activities Exempt from Permitting.

(1) No aquatic plant control permit is required by the Commission for the following waters or activities:

(a) Waters where all of the surrounding (360 degrees) upland property and submerged lands are wholly owned by one person, other than the state, unless there is a direct connection to Waters of Special Concern when herbicides are used and throughout any water use restriction periods required by the herbicide product label, or there is a connection to a manatee aggregation site that would allow the ingress and egress of a manatee into the waterbody.

(b) Artificial waters unless there is a direct connection to Waters of Special Concern when herbicides are used and throughout any water use restriction periods required by the herbicide product label, or there is a connection to a manatee aggregation site that would allow the ingress and egress of a manatee into the waterbody.

(c) Electrical power plant cooling ponds, reservoirs, or canals, unless there is a direct connection to Waters of Special Concern when herbicides are used and throughout any water use restriction periods required by the herbicide product label, or there is a connection to a manatee aggregation site that would allow the ingress and egress of a manatee into the waterbody.

(d) Waters that are less than 160 surface acres unless:

1. The Waters are a public waterbody, or

2. There is a direct connection to Waters of Special Concern when herbicides are used and throughout any water use restriction periods required by the herbicide product label, or there is a connection to a manatee aggregation site that would allow the ingress and egress of a manatee into the waterbody.

The acreage of waters in systems with any connections shall be calculated for each individual water rather than collectively as a system. Natural connections between non-exempt waters shall be considered part of those waters.

(e) In that specific area of a waterbody where an Environmental Resource Permit is issued by the Department of Environmental Protection or one of the state's Water Management Districts and aquatic plants are removed as a part of the permitted activity.

(f) Activities conducted, authorized, or contracted for by the Commission.

(g) In all freshwater bodies, except aquatic preserves designated under chapter 258, F.S., and Outstanding Florida Waters designated under chapter 403, F.S., a riparian owner may physically or mechanically remove herbaceous aquatic plants and semiwoody herbaceous plants, such as shrub species and willow, within an area delimited by up to 50 percent of the property owner's frontage or 50 feet, whichever is less, and by a sufficient length waterward from, and perpendicular to, the riparian owner's shoreline to create a corridor to allow access for a boat or swimmer to reach open water. All unvegetated areas shall be cumulatively considered when determining the width of the exempt corridor. Physical or mechanical removal does not include the use of any chemicals or any activity that requires a permit pursuant to part IV of chapter 373, F.S.

(2) Although certain waters are exempt from the Commission's permit requirements, all aquatic plant management activities shall be conducted in a manner so as to protect human health, safety, recreational use, and to prevent injury to non-target plant and animal life, and property, to the greatest degree practicable. When applying a herbicide in exempt waters, all persons shall comply with label rates, instructions, cautions, and directions, and shall follow the public notice requirements of paragraph 68F-20.0055(2)(c), F.A.C. No aquatic plant management activity using herbicides or mechanical harvesting equipment shall be conducted when manatees are in the control area in exempt waters. Copper-based herbicides shall not be used in any exempt waterbody directly connected to Waters of Special Concern without a permit from the Commission.

Rulemaking Authority 369.20, 369.22 FS. Law Implemented 369.20, 369.22, 403.088 FS. History–New 2-9-82, Amended 7-9-85, Formerly 16C-20.035, 16C-20.0035, Amended 5-3-95, Formerly 62C-20.0035, Amended 11-20-18.