

Lake Okeechobee Aquatic Plant Management Interagency Task Force Meeting Proceedings

The following individuals attended the Lake Okeechobee Aquatic Plant Management Interagency Task Force meeting on Wednesday, 22 April 2015 at the USACE South Florida Operations Office; Clewiston, FL.

U.S. Army Corps of Engineers (USACE)

David Lattuca
Jeremy Crossland
Jon Lane (Phone)
Erica Skolte (Phone)

Florida Fish and Wildlife Conservation Commission (FWC)

Dave Eggeman
Susanna Toledo
Dave Eggeman
Steve Gornak
Jeff Schardt (Phone)

South Florida Water Management District (SFWMD)

Mike Bodle
Ellen Allen
Chuck Hanlon
LeRoy Rodgers

Other Attendees

Kurt Ramsey, AAM
Scott Jackson, Syngenta
Paul Gray, Audubon Florida (Phone)
James Boggs, Helena Chemical
Carey Minteer, USDA-ARS
Kelli Gladding, SePRO Corporation

1. Public Comment Period

Kelli Gladding, a Market Development & Technical Support Specialist with SePRO Corporation, presented to the group about a new EUP Herbicide: TIGR (sethoxydim) for Grass Selective Control (Attachment's #1, #2, & #3). If you are interested in utilizing TIGR or if there are any questions regarding herbicide management please feel free to contact Kelli Gladding:

SePRO Corporation
New Smyrna Beach, FL 32168 | www.sepro.com

Mobile: 386-409-1175
kellig@sepro.com

2. Status Report of Treatment Program Activities on Lake Okeechobee

Susanna Toledo reported that since the last I/A meeting on February 11th, 2015 to the third week in April, 2015 a total of 1668.5 acres of floating plant species have been treated on Lake Okeechobee by Applied Aquatic Management (AAM) boat applicators. An additional 1300 acres of Water Lettuce was treated by an aerial application. This application is not yet complete, but should be finished by the end of April.

3. Interagency Flight Report of Floating Vegetation on Lake Okeechobee

Aerial survey of Lake Okeechobee occurred on 10 March 2015 and 14 April 2015. The flight on March 10th had an estimated total average 4217 acres of Water Lettuce (*Pistia stratiotes*) and Water Hyacinth (*Eichornia crassipes*), at a lake level of 14.58 (Feet-NGVD29) (Attachment #4). The flight on April 14th had an estimated total average of 418 acres of Water Lettuce and Water Hyacinth, at a lake level 13.69 (Feet-NGVD29) (Attachment #5). Dave Lattuca informed the group that USACE purchased a GoPro camera in order to capture pictures of invasive species while on the helicopter. He asked Mike Bodle to request the necessary equipment needed in order to mount the GoPro camera on the front of the SFWMD helicopter. Jeff Schardt had questions regarding the estimates of floating plant populations from the previous two I/A flight surveys. The group informed Jeff that the totals represented the whole Lake, and no areas will be excluded in future report. The next I/A flight will occur on May 11th, 2015.

4. USACE

Dave Lattuca had administration notes regarding the I/A Task Force: The meetings are recorded and the recordings are saved digitally. Anyone can request the digital recordings at any time. Also, the meeting minutes are distributed to the I/A Task Force list, and the minutes are loaded onto the Task Force website (<http://www.floridainvasives.org/Okeechobee/>). The current lake level is 13.68 (Feet-NGVD29) as of 22 April 2015. Jeremy Crossland informed the group that USACE still has money left in the Federal budget, and that in May the Corps will receive their full allotted budget. David Lattuca reported that the Corps has moved from a bi-weekly treatment schedule to a weekly treatment schedule, to represent FWC's management efforts. USACE continues to provide FWC will Removal of Aquatic Growth (RAG) Pre & Post treatment surveys. Mike Bodle informed USACE that many of the Kiosks located at the boat ramps surrounding Lake Okeechobee are showing their age, and may need replacement. USACE informed the Task Force that replacement Kiosks will be built and installed where needed. Dave Lattuca informed the group that on March 25th, he presented on behalf of the Task Force, a Web Presentation to the Monthly Florida Cisma (Cooperative Invasive Species Management Area) call. During the call, Cisma participants were interested in the I/A groups invasive species management efforts, in particular the management of *Luziola subintegra*. Dave Lattuca encouraged the group to participate with the surrounding Cisma's, in order to stop the spread of invasive species. Dave Lattuca worked with Florida Invasive Species Partnership (FISP) to report *Luziola* located on Lake Okeechobee on EDDMapS (<http://www.eddmaps.org/florida/>). Mike Bodle asked the group to revisit the concept of working with landowners and stakeholders surrounding Lake Okeechobee, in order to familiarize them with *Luziola*, in turn to help stop the spread of the species into their areas. In the past, the Task Force has gathered these interested parties to show them *Luziola* on Lake Okeechobee. The group asked Mike Bodle to be the lead, in order to set up another tour of Lake Okeechobee with the landowners and stakeholders to help educate the participants on the invasive species we have

located only on the Lake. Dave Lattuca attended the FLEPPC annual conference, and participated in the CISMA session, where the group worked on defining Early Detection and Rapid Response and categorizing invasive species throughout Lake Okeechobee. At the previous I/A Task Force meeting, Kyle Grandusky and Tom DeBusk presented on the Fisheating Creek FAVT Wetland Project. They asked for a letter of support on behalf of the Task Force for the presented project. Dave Lattuca gathered questions/comments from the Task Force members, and sent a letter to Kyle Grandusky (Attachment #6). Paul Gray from Audubon Florida informed the group of a letter of objection from Eric Draper to Kelley Boree, Re: Proposed Lease Modification/Sovereign Lands Authorization for Floating Aquatic Vegetative Tilling Project, Curry Island, Lake Okeechobee. (Attachment #7).

5. FWC

Susanna Toledo spoke about the aerial treatment which occurred on the southern islands in Lake Okeechobee. The initial application treated 1300 acres of Water Lettuce. The original treatment plan was from Kreamer Island to Clewiston. Susanna Toledo requested extending the treatment up the West Wall to Mayaca Cut. There were no objections from the group. Susanna Toledo talked on behalf of an idea to use a Lake Okeechobee Project Proposal (draft) form for the Task Force members to utilize as a group (Attachment #8). Toledo requested the group provide feedback on the draft form, so at the next I/A meeting, the form can be finalized. This project proposal form will help with communication between managers, because of the multitude of projects occurring on Lake Okeechobee. It was suggested that the form be completed by a manager two months prior to the project start date. Once the Project Form is completed by a manager, it will be attached to the Task Force website for public viewing.

Steve Gornak presented to the group on a Florida Fish and Wildlife Conservation Commission Proposed 5000 acre Emergent Vegetation Herbicide Treatments, occurring in spring 2015 on Lake Okeechobee (Attachment #9). There will be a 3 year ongoing research project in the plot in the Moore Haven marsh, which will research Apple Snail populations utilizing both pre and post treatment surveys. There were no objections from the Task Force group on the proposed project. Steve Gornak spoke on behalf of proposed FWC Ground based (buggy and ATV) Upper marsh touch up treatments (torpedograss, Brazilian pepper, & cogongrass), which will begin May 11, between Pearce and Indian Prairie Canals (Attachment #10). There were no objections from the Task Force group on the proposed project. Steve Gornak also presented to the group about possible cattail treatment areas in the Southern Portion of Lake Okeechobee (Attachment #11). FWC would also like to fill in the old agricultural ditches located in Ritta Island to help improve water sheet flow. Pelican Island would also be treated for encroaching cattail emergent vegetation. This will be future management efforts from FWC.

6. SFWMD

Ellen Allen proposed a Melaleuca treatment which will occur in the Moore Haven Marsh in Lake Okeechobee (Attachment #12). So far, the Southern Marsh Mapping and the Southern Marsh Aerial Treatment have been completed. Northern marsh mapping is scheduled for April 24th. The completed map will be distributed by May 1st. During May 4th-7th, SFWMD will ask for discussion items and questions regarding the proposed treatment areas. By May 1st, crews will begin work. SFWMD will then create a map of areas the ground crews completed. After this, SFWMD will reevaluate needs or additional aerial treatment in winter of 2015-16, and needs for ground crew follow up treatments in spring/summer of 2017.

Mike Bodle discussed Okeechobee Gourd propagule collection around Lake Okeechobee in order to help determine genetics.

Chuck Hanlon spoke about a proposed 880 acre emergent cattail/willow treatment in a historical rookery area in the Moore Haven marsh/Moonshine Bay area. (Attachment #13). This will help reopen foraging ground which has been disturbed by encroaching cattail growth.

7. Other/Old Business

David Lattuca informed the group that The Snail Kite survey crew counted 231 kites and 26 new nests on Okeechobee during Survey 2. This brings the total nest count to 66 for Okeechobee this year. 16 new nests were in the King's Bar/North Indian Prairie area, 2 new nests on Eagle Bay Island, 3 new nests in Henry Creek Marsh, 4 new nests in South Bay (very close to the previous South Bay nests), and only 1 new nest in the Fisheating Bay area.

*** Next Interagency **Flight** is currently scheduled for May 12th, 2015.

***Next Interagency **Meeting** is not currently scheduled.

Attachment #2- Evaluating Grass- specific Herbicides to Enhance Aquatic Restoration Projects

Evaluating Grass-specific Herbicides to Enhance Aquatic Restoration Projects



Michael D. Netherland – US Army ERDC
UF Center for Aquatic and Invasive Plants



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Background

- Torpedo grass is a major management challenge
 - ▶ Reliance on glyphosate and imazapyr
 - ▶ Non-selective control confounds restoration efforts
 - ▶ Private applicators – thousands of miles of shoreline
- Aggressive spread of *Luziola subintegra*
 - ▶ Reliance on glyphosate and imazapyr



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Torpedograss Control on Lake Okeechobee



Current strategy – treat near monocultures of grass and
HOPE natives re-colonize



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Objectives

- Screen grass-specific herbicides for activity on invasive grasses
- Determine if effective products have a fit in the aquatic market
 - ▶ Toxicity, use rates, patent life, Industry interest
- Evaluate selected herbicides on native species
- Work towards obtaining a FL EUP label



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Non-native aquatic grasses

West Indian marsh grass
Hymenachne amplexicaulis



Tropical American Watergrass
Luziola subintegra



Para grass
Urochloa mutua



All are perennial with extensive vegetative reproduction



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Initial Screening Methods

- Herbicides applied when stems were 30-45 cm



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Initial work conducted at UF Ona REC

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Methods

Herbicide	Rate	Adjuvant
glyphosate (Aquaneat)	4.2 kg ae ha ⁻¹	0.5% NIS
imazapyr (Habitat)	1.4 kg ai ha ⁻¹	0.5% NIS
quizalofop-p-ethyl (Assure II)	123 g ai ha ⁻¹	0.25% NIS
cyhalofop (Clincher)	312.9 g ai ha ⁻¹	2.5% MSO
diclofop (Hoelon)	1120 g ai ha ⁻¹	0.25% NIS
fenoxaprop-p-ethyl (Acclaim Extra)	194 g ai ha ⁻¹	0.25% NIS
Fluazifop (Poast)	210 g ai ha ⁻¹	1% MSO
clethodim (Clethodim)	560 g ai ha ⁻¹	1% MSO
Sethoxydim	560 g ai ha ⁻¹	1% MSO
Imazamox (Clearcast)	560 g ai ha ⁻¹	0.5% NIS
nicosulfuron (Accent)	93.3 g ai ha ⁻¹	1% MSO



FOPS and DIMS



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Methods

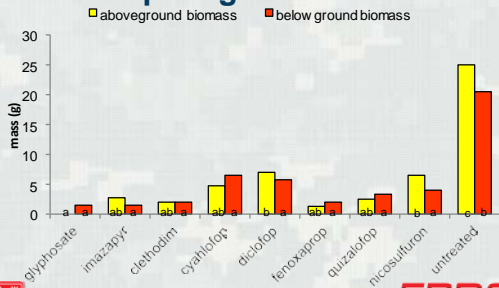
- Biomass harvested 8 weeks after treatment
- Data analyzed -mixed model ANOVA
 - Completely randomized design
 - Four replications
- Means separated using Tukey-Kramer method



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Results torpedograss - Ona



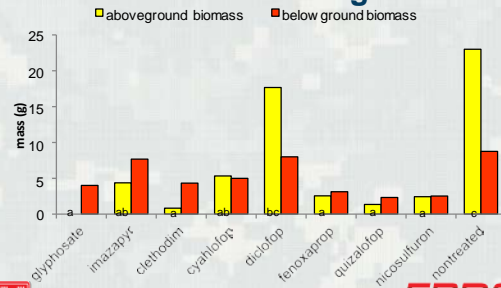
Similar letters indicate similar means within plant part (P < 0.05)



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Results West Indian marshgrass



Similar letters indicate similar means within aboveground biomass belowground biomass (P < 0.05)



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Next Step = Selectivity Trials

- Outdoor Mesocosms
 - ▶ Evaluated mixed native species
 - ▶ Torpedo grass, knotgrass, maidencane
 - ▶ Glyphosate and Imazapyr
 - ▶ Clethodim, Sethoxydim, Fluazifop
 - Toxicology packages, Industry interest, Efficacy
- Treated on 6/3/14 and 10/3/14
 - ▶ 4 replicates harvested at 8 WAT

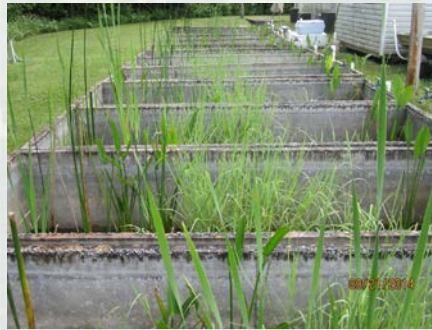


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Treatments Conducted in 900 L Tanks



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Response of native plant species at 8 weeks post-treatment

Herbicide Applied	Bulrush	Jointed Spikerush	Spikerush	Sagittaria	Cattail	Pickerelweed
Study 1 % Biomass Reduction (\pm 95% CI)						
Glyphosate	93 (5)	92 (6)	100	92 (3)	100	84 (10)
Imazapyr	64 (8)	96 (3)	98 (2)	92 (5)	97 (2)	98 (2)
Clethodim	1 (3)	-6 (8)	5 (3)	-5 (7)	-11 (13)	-6 (5)
Study 2 % Biomass Reduction (\pm 95% CI)						
Glyphosate	94 (7)	98 (2)	100	100	94 (5)	96 (3)
Imazapyr	67 (11)	100	100	100	100	100
Sethoxydim	-5 (3)	1 (6)	-7 (8)	-1 (6)	3 (6)	-8 (2)



"Highly Selective Products"



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Response of grasses at 8 weeks post-treatment

Herbicide Applied	Knotgrass	Torpedo grass (aboveground)	Torpedoglass (Below ground)
Study 1 % Biomass Reduction (\pm 95% CI)			
Glyphosate	89 (8)	94 (5)	72 (6)
Imazapyr	93 (5)	92 (4)	84 (5)
Fluazifop	81 (6)	81 (6)	75 (6)
Study 2 % Biomass Reduction (\pm 95% CI)			
Glyphosate	93 (5)	97 (3)	83 (9)
Imazapyr	90 (10)	94 (3)	90 (6)
Sethoxydim	74 (8)	82 (4)	72 (8)



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Ongoing Trials



Luziola growth is markedly improved in a Hydroponic culture.

Evaluating low rates of glyphosate in combination with grass herbicides

- Additive Effects ?
- Low rate glyphosate on natives.

Efficacy of spot treatments using higher rates - 2X to 3X the broadcast rate



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Method Development



Untreated

Imazapyr

Clethodim

- Methods developed to screen large numbers of rates, surfactants, combinations
- Studies ongoing for Luziola and Torpedo grass



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Future Work and Project Status

- Determine impact of
 - Time of year on efficacy
 - ▷ Good activity in both summer and fall
 - Sequential applications
 - Water depth
- Combinations - low rate glyphosate or imazapyr
 - High rates of surfactant (3 to 5% MSO)
- Working to Integrate Dr. Enloe into project
- EUP submitted for sethoxydim by SePRO
 - 500 acres



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Objective would be to treat invasive grasses prior to taking over native plant habitat

Following use of glyphosate to prevent invasive grasses from recovering with natives

Numerous interesting ecological questions can be addressed via field Trials

FUNDING:
FWC IPMS
COE Jacksonville District
US Army ERDC APCR



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Attachment #3- TIGR Herbicide, SePro

TIGR Herbicide 7969-58-67690, FL EUP No. FL 15-EUP-01

TIGR Herbicide 7969-58-67690, FL EUP No. FL 15-EUP-01

TIGR Herbicide

EPA Reg. No. 7969-58-67690

FPL20150316 Clean

General Label Changes:
Experimental Use Supplement



FOR EXPERIMENTAL USE ONLY

For use only at an application site of a cooperator and in accordance with the terms and conditions of the Experimental Use Permit.

Not for use by any person other than a participant or cooperator of the Florida-approved Experimental Use Program

FOR DISTRIBUTION AND USE ONLY WITHIN FLORIDA UNDER EUP No. FL15-EUP-01

TIGR HERBICIDE

For evaluation as a foliar-applied herbicide for the selective control of invasive grasses such as torpedograss, West Indian marsh grass, para grass, and Tropical American water grass, in ponds, lakes, swamps, riparian areas, wetlands, marshes, reservoirs, and other areas adjacent to aquatic sites.

Active Ingredient:
sethoxydim, 2-[1-(ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one.....18.0%
Other Ingredients.....82.0%
TOTAL.....100.0%
*Equivalent to 1.5 pounds of sethoxydim per gallon formulated as an emulsifiable concentrate
Contains petroleum distillate

KEEP OUT OF REACH OF CHILDREN
WARNING/AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read this label and the container label completely before use. User MUST comply with all safety, precautionary, and storage and disposal information listed on this and the container label.

This labeling must be in the possession of the user at the time of pesticide application.

TIGR 7969-58-67690, FL EUP No. FL 15-EUP-01

RESTRICTIONS AND LIMITATIONS

Do NOT use water in the immediate area where TIGR Herbicide is applied for drinking, swimming, or irrigation for one year after application. Do not apply within 500 feet of an irrigation intake or crop-growing area. Fishing in the immediate area of application is catch and release only. Unless site of application is fully restricted from public access, signage must be placed at the site of application indicating these restrictions. DO NOT use more than 40 ounces per acre per treatment and 10 pints annually.

APPLICATION INFORMATION

EMERGENT AQUATIC GRASS

TIGR Herbicide is being evaluated as a foliar-applied herbicide for the selective control of invasive grasses such as torpedograss, West Indian marsh grass, para grass, and Tropical American water grass, in ponds, lakes, swamps, riparian areas, wetlands, marshes, reservoirs, and other areas adjacent to aquatic sites.

Application Methods: Apply TIGR Herbicide to the emergent foliage of the target grasses. Apply in such a way as to maximize spray interception by the target vegetation while minimizing the amount of overspray that enters the water. For maximum activity apply when weeds are growing vigorously at the time of application, and include a surfactant in the spray solution. For best results, a methylated seed oil is recommended. TIGR Herbicide may be applied by using low-volume directed application techniques, a backpack or small hand held sprayer, or may be broadcast-applied by using ground equipment, watercraft or by helicopter. For backpack and small hand held sprayers, do not exceed a 5% solution for spot treatment applications to target aquatic grasses. Use methylated seed oil at a mixing rate of 1% volume/volume. For application by boat or ground equipment, use a minimum of 20 to 50 gallons of water per acre to ensure uniform coverage of the target plant.

With surface or helicopter application equipment, apply TIGR Herbicide in a minimum of 15 gallons of water per acre.

DO NOT apply to bodies of water or portions of bodies of water where emergent grasses do not exist.

Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash for one hour after application.

Representative sampling of water at select sites of application to monitor TIGR Herbicide concentrations following application will be conducted as part of the experimental use program. Please contact SePRO Corporation and the US Army Corp of Engineers (Gainesville, Florida) prior to application to arrange for potential field sampling.

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EPA Reg. No. 7969-58-67690
FPL20150316

SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032, U.S.A.

Attachment #4- Lake Okeechobee Interagency Flight, 3/10/2015

Lake Okeechobee Interagency Flight

Date 3/10/2015

Lake Elevation 14.58 (Feet-NGVD29)

Summary of Estimates

<i>Area of Lake</i>	<i>Average</i>	<i>%</i>	<i>SFWMD</i>	<i>AAM</i>	<i>FWC1</i>	<i>FWC2</i>	<i>USACE</i>
1. Torrey & Kreamer	2125.00	50%	1225	3000	300	5100	1000
2. Ritta	810.00	19%	850	1000	200	1500	500
3. East Wall - Coot Bay	275.00	7%	225	300	100	500	250
4. West Wall - Whidden	41.00	1%	20	5	70	100	10
5. Fisheating Bay	81.00	2%	75	100	30	100	100
6. Harney - Indian Prairie	161.00	4%	200	250	30	125	200
7. Indian P. - Kissimmee	125.00	3%	130	125	20	200	150
8. King's Bar	185.00	4%	175	250	100	200	200
9. Kissimmee - Taylor Cr.	227.00	5%	125	200	60	600	150
10. Taylor Cr. - Chancey	187.00	4%	125	350	60	200	200
TOTALS	4217.00	100%	3150	5580	970	8625	2760

Participants: SFWMD, Mike Bodle
AAM, Kurt Ramsey
FWC1, Susanna Toledo
FWC2, Brent Bachelder
USACE, David Lattuca

Attachment #5- Lake Okeechobee Interagency Flight, 4/10/2015

Lake Okeechobee Interagency Flight

Date April 14th, 2015

Lake Elevation 13.69 (Feet-NGVD29)

Summary of Estimates

<i>Area of Lake</i>	<i>Average</i>	<i>%</i>	<i>SFWMD</i>	<i>AAM</i>	<i>FWC1</i>	<i>FWC2</i>	
1. Torrey & Kreamer	20.00	4%	30	20	10	20	
2. Ritta	41.25	8%	35	75	15	40	
3. East Wall - Coot Bay	96.25	18%	120	135	30	100	
4. West Wall - Whidden	68.75	13%	35	75	65	100	
5. Fisheating Bay	70.00	13%	100	100	30	50	
6. Harney - Indian Prairie	20.00	4%	30	20	10	20	
7. Indian P. - Kissimmee	22.50	4%	20	20	10	40	
8. King's Bar	87.50	17%	100	75	100	75	
9. Kissimmee - Taylor Cr.	88.75	17%	80	100	100	75	
10. Taylor Cr. - Chancey	30.00	6%	n/a	30	n/a	n/a	
TOTALS	522.50	104%	550	650	370	520	

Participants: SFWMD, Mike Bode
AAM, Kurt Ramsey
FWC1, Susanna Toledo
FWC2, Brent Bachelder

Attachment #6- Letter from Task Force to Kyle Grandusky

Kyle D. Grandusky, P.E.
Federico, Lamb & Associates, Inc.
4524 Gun Club Rd., Suite 207
West Palm Beach, FL 33415
561-444-3668 Office
561-386-8219 Mobile
561-689-0556 Fax
Kyle@fla-inc.com

Re: Fisheating Creek FAVT Wetland Project - Amendment to the Curry Island Resource Management Plan

Dear Mr. Grandusky,

The Lake Okeechobee Aquatic Plant Management Interagency Task Force cannot provide a letter of support for the Fisheating Creek Floating Aquatic Vegetative Tilling (FAVT) Wetland Project, due to the fact that the project is still in the permitting phase with the United States Army Corps of Engineers, Regulatory Division ((SAJ-2014-03687-RWR (Water & Soil Solutions, LLC / Wetland Project) Curry Island)). I sent an email to the Task Force members requesting comments and/or concerns by 09MARCH2015. I have received no official correspondences to this day. I also let the Task Force members know they could forward potential questions directly to you.

Sincerely,



David Lattuca
Chairman of the Lake Okeechobee Aquatic Plant Management-
Interagency Task Force
Invasive Species Management Branch
US Army Corps of Engineers, Jacksonville District
david.r.lattuca@usace.army.mil
(w): 863-983-8101
(c): 863-602-7178

Attachment #7- Letter from Audubon Florida to Kelley Boree



Audubon FLORIDA

Eric Draper
Executive Director
Tallahassee Office
308 N. Monroe St.
Tallahassee, FL 32301
(850) 999-8028
edraper@audubon.org

March 27, 2015

Kelley Boree
Director,
Division of State Lands
3900 Commonwealth Boulevard MS. 100
Tallahassee, Florida 32399

Re: Proposed Lease Modification/Sovereign Lands Authorization for Floating Aquatic Vegetative Filling Project, Curry Island, Lake Okeechobee

Dear Kelley:

It has come to our attention that an entity known as "Lake Okeechobee Habitat Alliance, Inc.," is proposing a Floating Aquatic Vegetative Filling system (FAVT) for construction at Curry Island, within the Sovereign Submerged Lands of Lake Okeechobee. This proposal may reach you either directly from that entity, or by submission to DEPTy Water & Soil Solutions, LLC, 16112 East Duran Road, Loxahatchee, Florida 33470, or through Federico, Lamb & Associates, Inc., 4524 Gun Club Road, Suite 207 West Palm Beach, Florida 33415.

FAVT projects are designed to sequester nutrient pollution and while they may have merit under some circumstances, Audubon recommends that the Division of State Lands disapprove this proposal because:

- 1) Water quality treatment should occur outside of the Sovereign Submerged Lands of Lake Okeechobee. Using the public lands within the Lake itself to treat pollution does not actually protect the lake and would contradict historic precedent. This in effect converts "waters of the state" into a private pollution control system.
- 2) The lease from the Trustees to the Lake Okeechobee Habitat Alliance, Inc. for Curry Island, dated March 3, 2010 (Lease No. 4626) expired on March 2, 2015. The original lease did not include provisions authorizing or contemplating a structural project of this type. Therefore, a renewal and modification of that lease would be required for the project. We request that the lease not be renewed/modified to allow this proposed use.
- 3) Our analysis indicates the project has significant technical and hydrological challenges, negative biological impacts, and would likely offer little or no meaningful benefit in helping to resolve Lake Okeechobee's nutrient problems.

Audubon Florida's Detailed Analysis and Objections to FAVT Project at Curry Island, Lake Okeechobee proposed by "Lake Okeechobee Habitat Alliance, Inc."

- 1) Water quality treatment should occur outside of the Sovereign Submerged Lands of Lake Okeechobee. Using the public lands within the Lake itself to treat pollution does not actually protect the lake and would contradict historic precedent. This in effect converts "waters of the state" into a pollution treatment system.

One of the more noteworthy proposals to use Sovereign Submerged Lands for pollution cleanup emerged in 1975 when muck farmers on the shoreline of Lake Apopka in Orange County proposed to dike off approximately 500 acres of the Sovereign Lands within the lake to construct pollution control ponds. This proposal was soundly rejected by the State of Florida due to conflict with submerged lands management policies.

During the development of the "Surface Water Improvement and Management Plan" (SWIM Plan) for the Everglades which occurred during the Martinez administration circa 1988-1989 Everglades Agricultural Area farmers advanced the concept of subdividing Conservation Area 2 and 3 with levees and managing the areas inside the levees as stormwater treatment areas. This was strongly opposed by Audubon, and ultimately Department of Environmental Regulation Secretary Dale Tradmann, and was rejected. However, agricultural interests continued arguing for this concept during Everglades litigation settlement discussions. A resulting safeguard was built into the 1994 "Everglades Forever Act". This safeguard was the explicit metes and bounds designation of the "Everglades Protection Area" which includes all of the Everglades Water Conservation Areas managed by SFWMD. The Everglades Forever Act expressly specifies that pollution control must be attained before water reaches any part of the delineated "Everglades Protection Area". This geographic designation was put in the Everglades Forever Act precisely to prevent future consideration of schemes similar to Curry Island.

- 2) The lease from the Trustees to the Lake Okeechobee Habitat Alliance, Inc. (Lease No. 4626 dated March 3, 2010) for Curry Island expired on March 2, 2015. This expired lease was not consistent with the project now proposed. Therefore, a renewal and revision would be required for the project, to which we object.

The lease between LOHA and the Trustees was signed March 3, 2010 and expired March 2, 2015. Not only has the lease expired, but Section 25 of the lease from the Trustees stated:

"LESSEE shall not use or alter the leased premises except as provided for in the approved Management Plan without the prior written approval of LESSOR."

As noted above, the most fundamental policy issue this proposal raises is the conversion of publicly owned Sovereign Submerged Lands and Waters of the State to privately operated pollution control facilities. Numerous analogous proposals have been rejected over the years as inappropriate for location on Sovereign Submerged Lands.

I have attached a more detailed analysis/objection to this project which was prepared by Paul Gray, Ph. D. Science Coordinator for our Lake Okeechobee Watershed Program.

We request that you reject any proposal of this nature for the Sovereign Submerged Lands at Curry Island and that you recommend that the applicants pursue any proposed project of this nature on privately owned land.

Sincerely,

Eric Draper
Executive Director

The FAVT proposal was not envisioned in the approved Management Plan, and the Management Plan did not include any projects that altered surface soils. Specifically, in the archaeological section, it states:

"No land altering activities are currently proposed, but if in the future, ground disturbing activities are proposed, LOHA shall complete a professional archaeological and historical survey prior to the initiation of such work—unless LOHA documentation is available that clearly demonstrates any potentially significant archaeological and historical sounds have been destroyed by natural or human actions. At this point, however, this is speculative, because no land altering activities are proposed or envisioned." [italic emphasis is ours]

Lastly, there does not appear to be a fund to revert the FAVT to original conditions if the project fails, produces negative impacts, or if funding is terminated.

Therefore, not only the lease needs renewal, but constructing the FAVT would require significant revisions to the Management Plan.

- 3) Our analysis indicates the project has significant technical and hydrological challenges, and would likely have little or no effect on Lake Okeechobee's nutrient problems.

Hydrology

The hydrology of Fishcating Creek is "flashy." The overwhelming majority of water, and nutrients therein, will flow past the FAVT during high flows. Further, during no-flow times there will be insufficient water to support submerged plants.

Specifically, Section 6.2 of the Northern Everglades Plan¹ noted that sixty percent of Fishcating Creek's annual flows occurred in only 10% of the time (about 5 weeks), at a flow rate greater than 758 cfs (Fig. 1). The FAVT would have a maximum pumping capacity of 120 cfs, which would add about six inches of water to the facility in one day and fill it in about 4 days. Thus, the FAVT could take a maximum of 16% of the daily flows, but for only a fraction of the days during the "5 weeks" of high flows. This would not allow enough treatment for an appreciable change in nutrient loads reaching Lake Okeechobee.

Conversely, Fishcating Creek has no flow for about half the year (Fig. 2). Thus, water needed to keep submerged plant impoundments wet is probably not available and this feature will not function properly. Data from STAs has shown that that continued hydration is required to

¹ Wetlands Conservation, 2011, Curry Island Resource Management Plan, Prepared for Lake Okeechobee Habitat Alliance (LOHA) and submitted to the Florida Department of Environmental Protection.

² SFWMD, 2008, Lake Okeechobee Watershed Construction Project: Phase II Technical Plan, SFWMD, FDEP and FWAACS.

prevent drydowns that lead to vegetation loss, mineralization of organic nutrients and a concomitant burst of phosphorus release when the system is rehydrated.

If pumps were run when the creek had no flow, it could significantly drain the upper creek. Conversely, if water backflowed to the pumps from the Lake, it would tend to draw relatively cleaner water from the nearby marsh that would be replaced with more nutrient enriched water pulled from the Lake's center, creating net harm to the marsh.

- Results also indicate that it will be necessary to capture a substantial portion of the peak flows in the watershed in order to store a large percentage of the total flow volume. This is particularly true in the Fishcating Creek sub-watershed where 69 percent of the total flow volume occurs when discharges are greater than 75% cfs (the 10 percent exceedance level). In other words, 60 percent of the total flow volume resulted from the highest 10 percent of the daily flows.

Table 6-2. Flow characteristics for key Lake Okechobee sub-watersheds.

Sub-watershed	10% Exceedance Flow Rate	% Total Flow Volume when Flow > 10% Exceedance Flow Rate	5% Exceedance Flow Rate	% Total Flow Volume when Flow > 5% Exceedance Flow Rate
Stromwater (condon fl.)	1,702 cfs	37%	1,038 cfs	21%
Turkey Creek-Noddy Slough	776 cfs	44%	1,187 cfs	27%
Lake Indigo	1,105 cfs	48%	1,968 cfs	38%
Fishcating Creek	758 cfs	69%	1,782 cfs	33%

Figure 1. Fishcating Creek maximum flows from the Phase II Technical Plan (2008) and the observation that a substantial portion of the flows need to be captured at once to effectively deal with the loads.

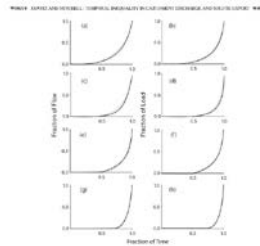


Figure 2. Fishcating Creek flows, shown in graphs (c) and (d) above, show no flow for about half the year (source: Lawitz, J.W., and J. Mitchell (2011). Temporal inequality in catchment discharge and solute export. Water Resour. Res., 47, W00J14, doi:10.1029/2010WR010973).

Other technical issues

- The project is not self-mitigating as claimed because:
 - Mitigation is not like-kind, it would destroy short hydroperiod emergent marsh and replace it with submerged and floating leaf communities. The 440 acres targeted for the FAVT are short-hydroperiod marshes in Lake Okechobee. Although management has been sub-optimal, that does not justify replacing them with a different habitat type. Short-hydroperiod marshes have unique habitat qualities and benefits that would be lost without replacement.
 - The project's dikes and ditches will alternatively fill lake bottom (loss of wetland acreage) and create deep-water habitat (long-lived aquatic predator refugia where they should not be). The dikes would fill wetland habitat and replace it with upland habitat as resulting in a net loss of wetlands. The upland habitat would be suboptimal as well by serving as roads. The borrow ditches would create long-hydroperiod habitats that would sustain predators such as large fish and long-lived predatory invertebrates (large coleopterans, hemipterans, etc.) that are periodically removed from short-hydroperiod habitats. This predator removal function is essential to many

short-hydroperiod marsh-dwellers, such as treefrog tadpoles, grass shrimp, and other abundant prey items.

- The floating plant unit will attract wildlife and flow them under once a year, which is a detriment, not a benefit, to them.
- The FAVT will attract many animals with limited mobility such as turtles, snakes, sirens, amphibians, frogs, apple snails, and others who will not be able to flee during dewatering. These animals then will be killed by the plowing operation. This ecological trap contradicts the idea that the project is self-mitigating by providing benefits. The net effect is a potential biological "sink" for many species.

- The long-term sequestration of phosphorus remains very uncertain.
- The 2015 University of Florida Water Institute report commented on FAVT projects saying, "At present, there is not adequate information to evaluate the long-term sustainability of P removal by this [FAVT] system because biomass incorporated into the soil undergoes rapid decomposition and it releases P and other nutrients that can enter the water column once the soil is flooded. Further evaluation is needed to determine the long-term sustainability of expected P removal rates and cost of operating these systems."

We also note that because the FAVT would be in the Lake, the phosphorus is still being added to the lake. Attempting to sequester (or concentrate) phosphorus in the FAVT footprint ultimately will create a new phosphorus hotspot in Lake Okechobee's marshes.

Prepared by: Paul Gray, Ph. D. Science Coordinator Audubon Lake Okechobee Watershed Program

¹ Graham, W. D., M. J. Angelo, T. K. Frazier, P. C. Frederick, K. E. Havens, and K. R. Reddy. 2015. Options to reduce high volume freshwater flows to the St. Lucie and Caloosahatchee Estuaries and move more water from Lake Okechobee to the southern Everglades: an independent technical review by the University of Florida Water Institute, Gainesville.

Attachment #8- FWC Draft Lake Okeechobee Project Proposal Form

Lake Okeechobee Project Proposal

Summary of project and reason for project (include location, history if applicable, benefits, etc.):

Project plan details (herbicides, burning, mechanical removal, equipment being used, etc.):
Attach map of project location to this form.

2 year maintenance plan post-treatment if applicable (photo monitoring, surveys, re-treatments, etc.):

Project manager (include phone number and email address):

Contacts List:

We can send treatment plan to entire interagency distribution list or just organization/agency representatives, like below.

USACE - names with email address

SFWMD IPM - names with email address

SFWMD Research - names with email address

FWC (IPM, AHRES, Snail kite) - names with email address

FWS - names with email address

Audubon - names with email address

UF - names with email address

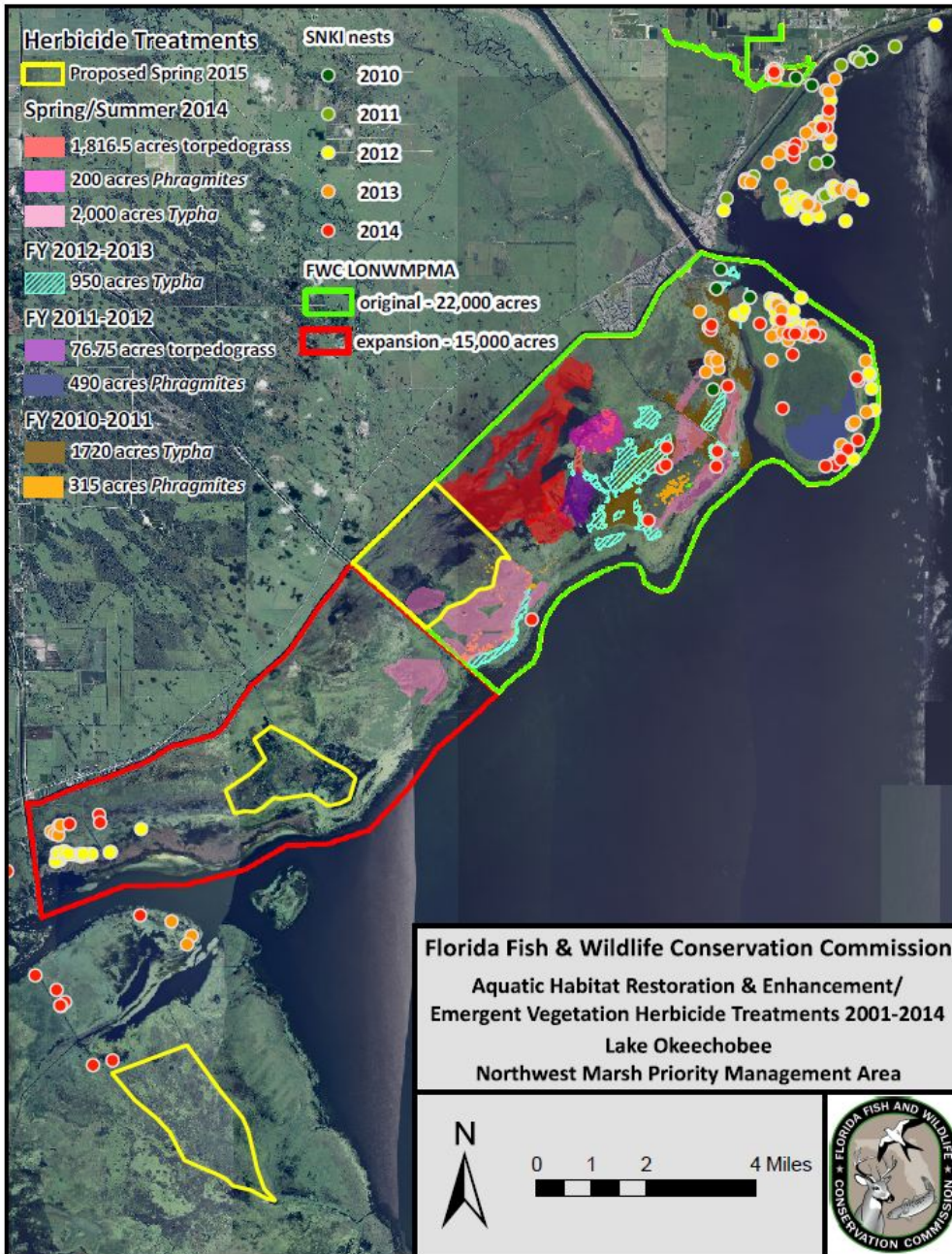
FAU - names with email address

Etc. - names with email address

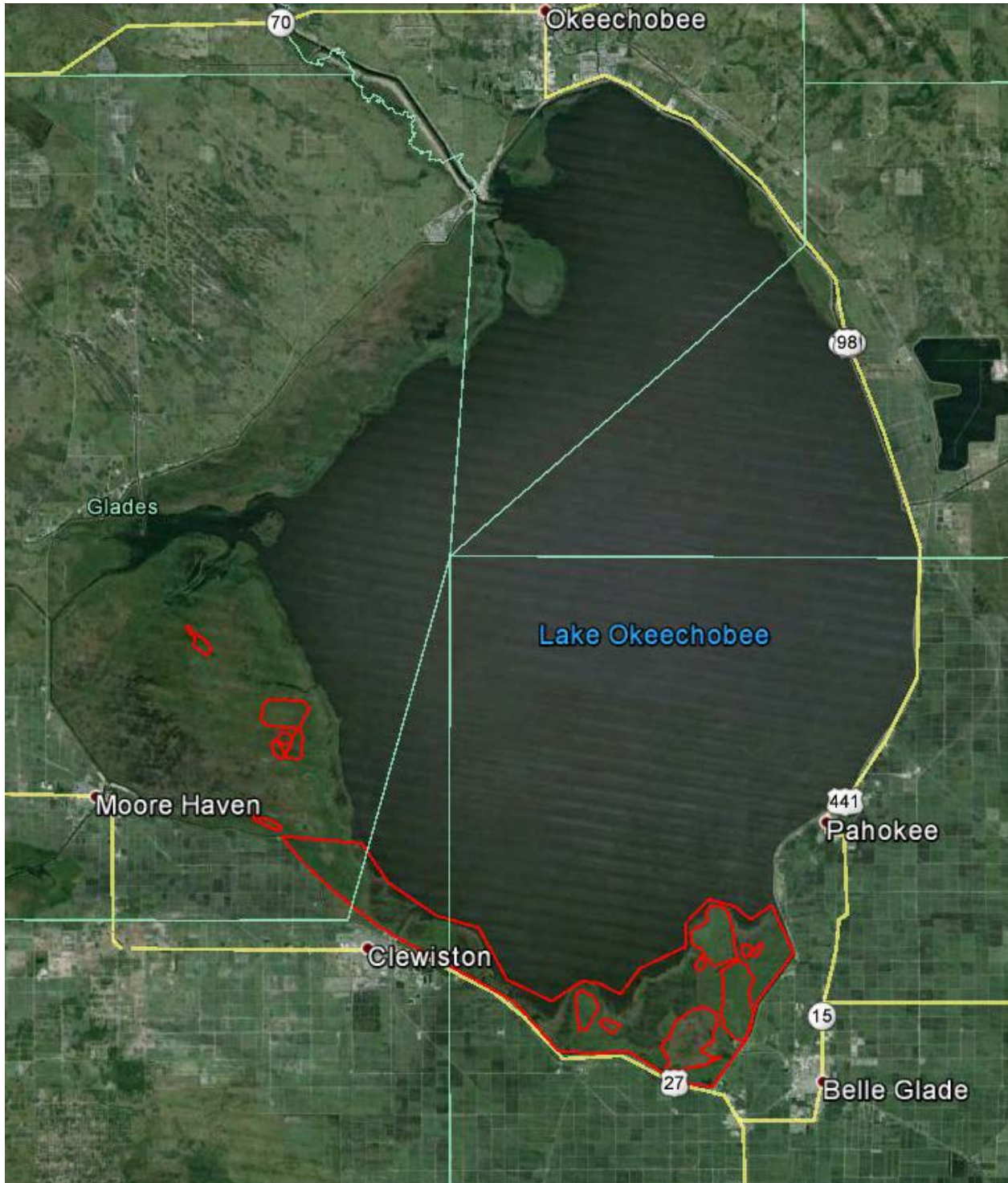
Attachment #9 - FWC Proposed Emergent Vegetation Herbicide Treatments Spring 2015, Lake Okeechobee



Attachment # 10 - FWC AHRES Emergent Vegetation Herbicide Treatments 2001-2014



Attachment # 11 - FWC Early Proposed Work in Southern Lake Okeechobee



Attachment # 12 – SFWMD Melaleuca Treatments in the Lake Okeechobee Marsh

Melaleuca in the Lake Okeechobee Marsh

04-22-15

Ellen Allen

edonlan@sfwmd.gov



Methodologies

- Crews will travel to mapped points and treat all melaleuca at that point and any others observed that are not mapped
- Crews may not access areas of thick vegetation
 - They will report which points they treated
- 10% imazapyr & 40% glyphosate
- Cut stump, girdle or hand pull
 - Crews will leave trees upright when possible to reduce stump hazard
- Avoid areas of snail kites and other requested non-treatment areas
- May treat other species including schinus and cogon

Proposed schedule

- Southern marsh mapping – complete
- Southern marsh aerial treatment – complete
- Northern marsh mapping – scheduled for Friday April 24th
- Map completion and distribution by Friday May 1st
- May 4-7 discussion and questions on proposed treatment areas
- May 11th Crews begin work
- Create a map of areas ground crews completed
- Reevaluate need for additional aerial in winter of 2015-16
- Reevaluate need for ground crew follow up spring/summer 2017

Attachment # 13 – SFWMD Emergent Vegetation Herbicide Treatments in Moore Haven Marsh

