

**MINUTES OF THE MEETING  
of the  
HARRIS CHAIN OF LAKES RESTORATION COUNCIL**

**October 5, 2012**

The regular meeting of the Harris Chain of Lakes Restoration Council was held at 9:00am on October 5, 2012 at the Lake County Board of County Commissioner Chambers, 315 West Main Street, Tavares, Florida.

**Members Present**

Skip Goerner, Vice Chairman  
Sid Grow  
Robert (Bob) Johnson  
Don Nicholson  
Keith Truenow  
Lloyd Woosley

**Members Absent**

Hugh (Dave) Davis II, Chairman  
Richard (Rick) Powers P.G., Secretary  
Edward Schlein, M.D

**1. CALL TO ORDER**

Vice Chairman Goerner called the meeting to order at 9:04am.

**2. INVOCATION AND PLEDGE OF ALLEGIANCE**

Councilman Nicholson gave an invocation. The Pledge of Allegiance followed.

**3. COUNCIL ROLL CALL; REMINDER FOR OTHERS TO SIGN IN**

Vice Chairman called the roll. Chairman Davis, Councilman Powers and Councilman Schlein were absent.

**4. APPROVAL OF MINUTES**

- Kraig McLane reviewed the June minutes and stated two substantive changes were made and requested approval. June 1, 2012 meeting minutes were approved by unanimous vote.
- Kraig McLane reviewed the July minutes and stated that July minutes needed to include the last name of the presenter from FWC John Benton and the bold lettering would be removed. July 13, 2012 meeting minutes were approved. Councilman Sid Grow abstained from the vote of the July minutes.
- Kraig McLane reviewed Councilman Woosley's changes to the September minutes and requested that the changes be made and brought back to the Council in November. Vice Chairman Goerner agreed with Councilman Woolsey.

**5. PUBLIC COMMENTS**

There were no public comments.

**6. PRESENTATIONS / ACTIONS**

Vice Chairman Goerner called for a presentation by Dr. Michael Coveney, Technical Program Manager, St. Johns River Water Management District (SJRWMD).

- Dr. Coveney gave a presentation on pesticide risk in the Lake Apopka North Shore Restoration Area (NSRA). The presentation included: 1) Organochlorine Pesticides (OCP) in fish in the NSRA - risk to wildlife and to humans via consumption; 2) projected future OCP levels and associated risk to help plan future management; 3) shallow flooding is required to manage initial and near-term ecological and human health risks from fish consumption; 4) OCPs in fish should reach safe levels for consumption by birds approximately 5 years after new flooding in open water habitat; 5) OCPs in fish might require 2 or more decades to reach safe levels for consumption by humans; 6) DDT-family OCPs persist longer in the environment than other OCPs studied and therefore determine the overall time needed to reach safe levels; 7) for some properties, times will be longer; and 8) in all cases, fish will be analyzed to confirm safe OCP levels before management of restoration areas is changed.
- The Council requested that Mr. McLane set up a tour of the North Shore Restoration Area for the Council members.
- Marcy Policastro, Wildwood Consulting, reviewed the updated draft and edits of the Harris Chain of Lakes Restoration Council 2012 report to the Florida Legislature. She stated that this report would need to be finalized as much as possible at the current meeting. The next meeting will be to approve the report to submit to the Legislature. The Council provided feedback and edits, which are incorporated into these minutes (end of document) via inclusion of the October 5, 2012 version of the annual report that was edited during the meeting.

**7. COUNCIL & AGENCY QUESTIONS & ANSWERS**

- Mike Perry, Lake County Water Authority (LCWA), updated the Council: 1) Apopka Beauclair canal dredging was restarted on September 1, 2012. As of October 75% of the dredging is complete and expected to be finished by Summer 2013.

**8. COUNCIL MEMBER COMMENTS**

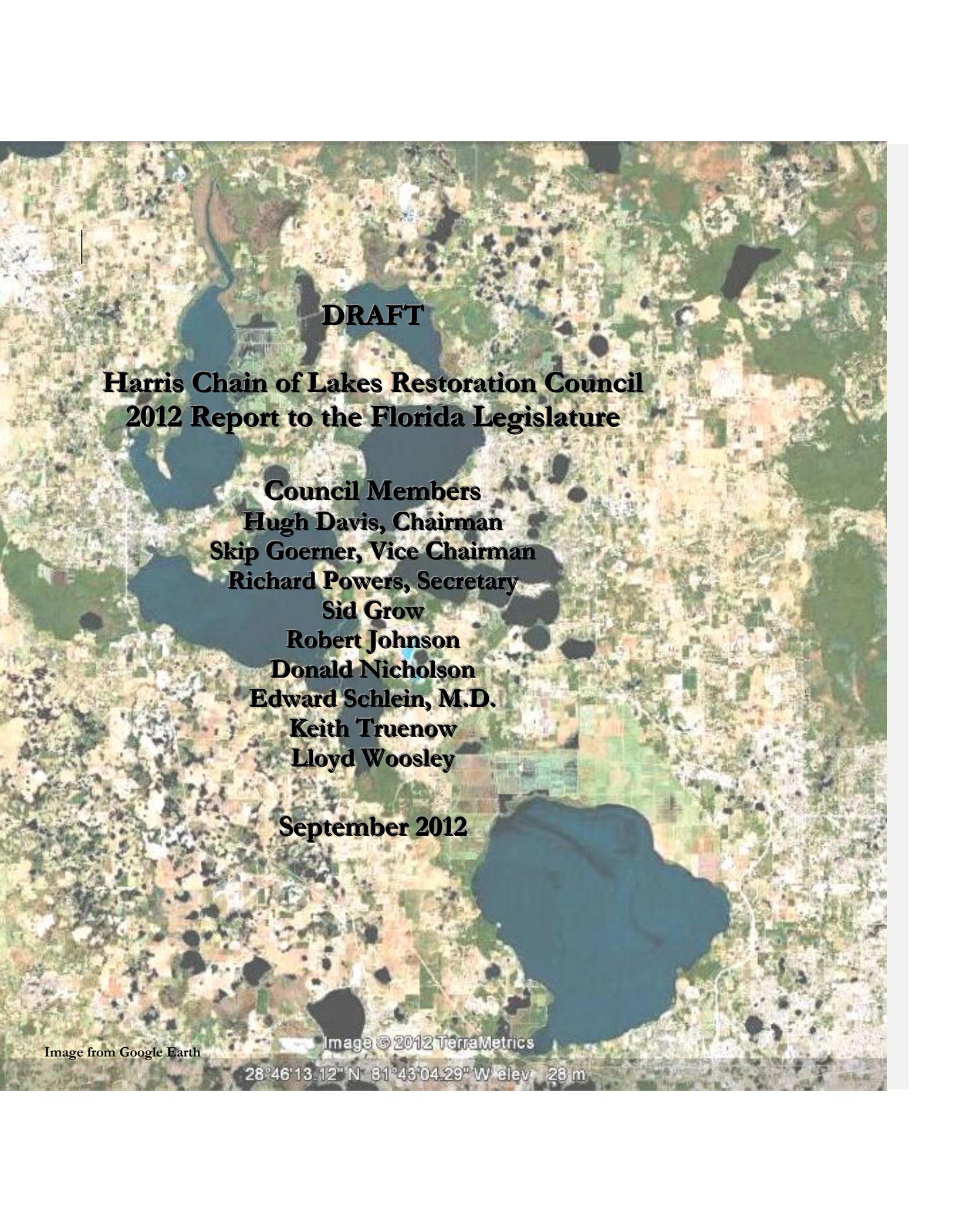
**A. Comments**

- Councilman Grow asked if the meetings are going to be moved from the 1<sup>st</sup> Friday of the month. Vice Chairman Goerner stated that the discussion will be held when Chairman Davis is back.

**B. Discussion of Next Scheduled Meeting: November 2, 2012**

**9. ADJOURNMENT**

The meeting was adjourned at 12:36 pm



**DRAFT**

**Harris Chain of Lakes Restoration Council  
2012 Report to the Florida Legislature**

**Council Members**

**Hugh Davis, Chairman**  
**Skip Goerner, Vice Chairman**  
**Richard Powers, Secretary**  
**Sid Grow**  
**Robert Johnson**  
**Donald Nicholson**  
**Edward Schlein, M.D.**  
**Keith Truenow**  
**Lloyd Woosley**

**September 2012**

**DRAFT**

**HARRIS CHAIN OF LAKES RESTORATION COUNCIL**

**2012 REPORT TO THE FLORIDA LEGISLATURE**

In compliance with Chapter 373.467, Florida Statutes

**Issued by:**

**Harris Chain of Lakes Restoration Council**

Hugh Davis, Chairman  
Skip Goerner, Vice Chairman  
Richard Powers, Secretary  
Sid Grow  
Robert Johnson  
Donald Nicholson  
Edward Schlein, ~~M.D.~~  
Keith Truenow  
Lloyd Woosley

**Comment [LHW1]:** Do we need to add professional credentials? I'm a P.E. as I think Dick is, but don't think we should list it.

**Prepared by:**

Wildwood Consulting, Inc.



**September ~~November~~ 2012**

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## LIST OF ACRONYMS

|               |                                                   |
|---------------|---------------------------------------------------|
| <b>BMAP</b>   | Basin Management Action Plan                      |
| <b>cfs</b>    | Cubic Feet Per Second                             |
| <b>FDEP</b>   | Florida Department of Environmental Protection    |
| <b>FWC</b>    | Florida Fish and Wildlife Conservation Commission |
| <b>LCWA</b>   | Lake County Water Authority                       |
| <b>MFLs</b>   | Minimum Flow and Levels                           |
| <b>NSRA</b>   | North Shore Restoration Area                      |
| <b>NuRF</b>   | Nutrient Reduction Facility                       |
| <b>SJRWMD</b> | St. Johns River Water Management District         |
| <b>SWIM</b>   | Surface Water Improvement and Management          |
| <b>TAG</b>    | Technical Advisory Group                          |
| <b>TMDL</b>   | Total Maximum Daily Load                          |
| <b>UF</b>     | University of Florida                             |

## **EXECUTIVE SUMMARY**

The Harris Chain of Lakes Restoration Council (Council), in conjunction with their state and local agency partners, met regularly during the reporting period of November 2011 through October 2012. The Council was given technical presentations throughout this time period on studies of and initiatives to restore and manage the Harris Chain of Lakes. Based on these technical presentations, the Council has made recommendations on restoration and lake management efforts. These recommendations are summarized below and are detailed in this annual report to the Florida Legislature.

**Comment [Marcy2]:** Recommendations will be added once the Council has approved them.

### **Lake Water Level Management**

#### **Minimum Flows and Levels**

#### **Lake Apopka North Shore Restoration**

#### **Lake Beauclair and Apopka-Beauclair Canal Dredging**

#### **Lake Apopka Dredging**

#### **Vegetation Mapping**

#### **Invasive Aquatic Plant Management**

#### **Mechanical Harvesting of Nuisance Aquatic Vegetation**

#### **Sport Fish Stocking**

## 1.0 STATUTORY AUTHORITY

The Harris Chain of Lakes Restoration Council (Council) was established by the Florida Legislature in 2001 ([Chapter 373.467 Florida Statutes](#)) with the powers and duties to: (a) review and audit all data specifically related to lake restoration techniques and sport fish population recovery strategies, (b) evaluate whether additional studies are needed, and (c) explore all possible sources of funding to conduct restoration activities. The Legislature also established the Harris Chain of Lakes Restoration Program ([Chapter 373.468 Florida Statutes](#)), which directed the Florida Fish and Wildlife Conservation Commission (FWC) and St. Johns River Water Management District (SJRWMD), in conjunction with the Florida Department of Environmental Protection (FDEP), pertinent local governments, and the Council to review existing restoration proposals to determine which are the most environmentally sound and economically feasible methods of improving the fish and wildlife habitat and natural systems of the Harris Chain of Lakes.

## 2.0 SUMMARY OF 2012 MEETINGS AND PRESENTATIONS

During the period of November 2011 through October 2012, the Council held nine regular monthly meetings. Throughout the year, the Council received scientific information and data concerning water quality and aquatic ecological conditions and information on restorative measures for the Harris Chain of Lakes from several state and local agencies. These entities include the SJRWMD, Lake County Water Authority (LCWA), FWC, and University of Florida (UF). The technical presentations given by these partners to the Council are listed in [Table 1](#). Specific topics included:

- Management of lake [water](#) levels;
- [Water quality conditions and trends](#);
- [Vegetation mapping and control of nuisance aquatic vegetation](#);
- Sport fish stocking to provide economic benefits to the region;
- In-lake and canal dredging to improve water quality and provide boat access; and
- Several other lake science and management topics.

The information received was reviewed and discussed by the Council in detail, and used as the basis for developing recommendations for future restorative measures and management practices for the Harris Chain of Lakes. Copies of the meeting minutes and the presentations given during the 2012 reporting period (November 2011 through October 2012) are provided as appendices to this report. The appendices are provided in digital format on the enclosed compact disc and also may be downloaded from the Council's website at [www.harrischainoflakescouncil.com](http://www.harrischainoflakescouncil.com).

**TABLE 1: TECHNICAL PRESENTATIONS FROM NOVEMBER 2011 THROUGH OCTOBER 2012**

| Meeting Date      | Presentations                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| November 4, 2011  | Dave Walker, SJRWMD, <u>gave a presentation on agency ed on SJRWMD's plans for temporary management of lake levels through reduced discharges from hydrologic control structures.</u>                                                                                                                                                                  |
| January 6, 2012   | Nathalie Visscher, FWC, gave a presentation on current and historical vegetation mapping of the Harris Chain of Lakes. Dan Canfield, UF, provided an update on the <u>U.S. Environmental Protection Agency's</u> proposed numeric nutrient criteria rule and the implications for the Harris Chain of Lakes.                                           |
| March 2, 2012     | Jim Gross, SJRWMD, gave a presentation on the minimum flows and <u>lake water levels</u> planning process.                                                                                                                                                                                                                                             |
| April 6, 2012     | Joe <del>Branham, PhD,</del> and Bill Baxley gave presentations on the hydrology of Bugg Spring, <u>which provides spring flow to Lake Harris.</u>                                                                                                                                                                                                     |
| May 4, 2012       | Mike Cullum, SJRWMD, <u>gave a presentationed</u> on lake <u>water level</u> management in the Harris Chain of Lakes.                                                                                                                                                                                                                                  |
| June 1, 2012      | Mike Cullum, SJRWMD, gave a <u>follow-up</u> presentation on lake <u>water level</u> management and the proposed interim operating schedule for the Harris Chain of Lakes.                                                                                                                                                                             |
| July 13, 2012     | Michael Coveney, SJRWMD, <u>gave a presentationed</u> on the ecological considerations in setting lake <u>water level</u> regulation targets for the Harris Chain of Lakes.                                                                                                                                                                            |
| September 7, 2012 | <u>Dave Walker, SJRWMD, provided an update on the Lake Apopka North Shore Restoration Area projects. Nathalie Visscher, FWC, gave a presentationed on FWC's aquatic plant management plan for the Harris Chain of Lakes for 2012-2013. Brandon Thompson, FWC, gave a presentationed on FWC's bass research on phase II bass stocking and sampling.</u> |
| October 5, 2012   |                                                                                                                                                                                                                                                                                                                                                        |

**Comment [LHW3]:** Previous comment about deleting professional/academic credentials. Not needed and once you start, have to add it every where for internal consistency in the document.

Also during the 2012 reporting year, several members of the Council's Technical Advisory Group (TAG) provided periodic updates on lake water quality and restoration issues being reviewed by the Council. The members of the TAG are listed in Table 2Table 2Table 2.

**TABLE 2: 2012 TECHNICAL ADVISORY GROUP MEMBERS**

| Agency or Organization               | Representative         |
|--------------------------------------|------------------------|
| SJRWMD                               | Walt Godwin            |
| FDEP                                 | Dave Herbster          |
| FWC                                  | Dennis Renfro          |
| Florida Department of Transportation | Stephen Tonjes         |
| U.S. Army Corps of Engineers         | Vacant                 |
| UF/LAKEWATCH                         | Daniel E. Canfield Jr. |
| LCWA                                 | Michael Perry          |

**3.0 COUNCIL FINDINGS AND RECOMMENDATIONS**

This section outlines the discussions and recommendations by the Council based on information received during the reporting period. These recommendations include additional projects and funding needed to effectively implement restoration measures for the Harris Chain of Lakes in the upcoming year.

### 3.1 Lake Water Level Management

Dave Walker, SJRWMD, reported at the November 2011 meeting that the [water management district](#) ~~SJRWMD~~ was again making temporary changes to the discharge schedules for the Apopka, Burrell, and Moss Bluff lock and dams due to expected drought conditions in early 2012 associated with a predicted La Niña event. The proposal was to have zero discharge from the Apopka and Burrell lock and dams and limit the discharge at the Moss Bluff Lock and Dam to 10 cubic feet per second (cfs). This same temporary operation schedule was used in 2011, and the lakes rose about six inches during that time, although there was also more rain than expected.

The Council expressed concern about the effect of the temporary change in the discharge schedules on water levels in Lake Griffin. If the predicted drought conditions were to occur, water levels in Lake Griffin could be reduced during the critical, sport fish spawning period thus having a potential longer term effect on fish populations. Lower lake [water](#) levels would affect the amount of vegetation in the lake, which would reduce the amount of spawning habitat available. Effects on the local economy and property owners on Lake Griffin also could result.

In January 2012, the SJRWMD held a public meeting to discuss the [proposed](#) temporary change in discharge [schedule](#). During the meeting, there was public input requesting a 23-23-0 cfs discharge schedule, and the SJRWMD implemented this schedule through April 27, 2012. On April 27, the SJRWMD changed the discharge schedule to 0-0-0 cfs because levels in Lake Apopka had dropped by two feet within the last year, and ~~they~~ [agency was/were](#) concerned about the effects of the low lake [water](#) levels on the restoration efforts.

**Comment [LHW4]:** Best not to use personal pronouns in technical reports.

Kraig McLane, SJRWMD, stated during the April 2012 meeting that the SJRWMD was looking to implement an interim regulation schedule by June 2012. The goal of this regulation schedule would be to hold water longer in the Super Pond (lakes Beauclair, Carlton, Dora, Eustis, Harris, and Little Lake Harris). The SJRWMD is also developing a ~~revised standard~~ [water level](#) regulation ~~scheduled~~ for the Harris Chain of Lakes that should be in place in 2014. Mike Cullum, SJRWMD, during the May 2012 meeting, provided details on the SJRWMD's analysis to ~~determine the interim lake levels~~. The current regulation schedule includes minimum desirable and maximum desirable [water](#) levels for Lake Apopka, the Super Pond, and Lake Griffin.

**Comment [LHW5]:** Not sure what this means. I wasn't at this meeting and not able to clarify the statement.

The Council expressed concerns about how quickly water could be ~~released from~~ ~~let out of~~ the lakes to prevent flooding in the case of a tropical storm or hurricane. For the Harris Chain of Lakes, the critical sport fish spawning season and [peak](#) tourism period is [during the](#) winter ~~through the~~ ~~early spring~~ ~~season~~. ~~The~~ ~~lake~~ ~~water~~ levels must be maintained at their highest possible level during ~~these months~~ ~~this time to support the local~~ ~~because it is a key time for the~~ economy. ~~Unfortunately, this~~ ~~but~~ is ~~normally~~ ~~usually~~ a dry period ~~in Central Florida~~. In addition, the Council members were concerned about ~~the effects of the regulation schedule on~~ ~~how~~ the amount and types of [aquatic](#) vegetation ~~present~~ in the lake ~~system~~ ~~could be impacted by the~~ ~~regulation~~ ~~schedule~~. Mike Perry, LCWA, stated that the Nutrient Reduction Facility (NuRF) is capable of treating flows up to 300 cfs ~~from out of~~ Lake Apopka. He expressed concern that if the discharge is allowed to be greater than ~~this threshold~~ ~~300 cfs~~, ~~a portion of~~ the flow would bypass the NuRF and the water quality benefits that have been gained by the project ~~would~~ ~~it~~ quickly disappear.

Mike Cullum presented the proposed interim lake [water](#) level schedule options at the June 2012 meeting, which were also discussed at a SJRWMD public meeting on May 31, 2012 in Leesburg. For the analysis, the baseline condition was modeled as the current operating schedule. When looking at the different interim lake [water](#) level scenarios, SJRWMD's top priority was flood protection. The SJRWMD determined two potential scenarios: (1) Scenario A, which would raise the "recession" portion ~~of the schedule hydrograph during~~ the spring to keep water levels higher for a longer [period of time](#) in the Super Pond and Lake Griffin from March through June; and (2) Scenario A1, which would [likewise](#) raise the "recession" portion ~~during~~ the spring and [also raise the floor portion of the schedule hydrograph during the](#) summer to keep more water in the Super Pond and Lake Griffin during ~~the a longer period of time into the spring and~~ fall. ~~Neither The~~ interim schedule [option](#) would ~~not~~ result in any changes to the Lake Apopka regulation schedule because the North Shore Restoration Area (NSRA) is not ready to [receive water from the lake](#)~~take the additional water yet~~.

Michael Coveney, SJRWMD, explained at the July 2012 meeting the ecological considerations of setting targets for lake [water](#) level management. The primary ecological goal is to preserve healthy lake floodplain communities for fish and wildlife. ~~This~~ ecological goal has to be balanced with other considerations, such as flood control, water quality, recreation, navigation, and water supply and storage. The SJRWMD is currently developing two sets of lake [water](#) level targets: (1) [minimum flows and levels \(MFLs\)](#) ~~(see Section 3.1.1)~~, and (2) lake [water](#) level regulation schedule ~~(see Section 3.1)~~. As part of target developed, the SJRWMD is looking at the magnitude, duration, and return interval of different lake [water](#) levels. A high water level target will be set to allow flooding of the floodplain habitat, prevent encroachment of the uplands, and protect organic soils. An average water level target will be set to protect wetlands and organic soils from [excessive over](#)-draining. A low water level target will also be set to allow for seed germination and [lake](#) sediment consolidation. Data were collected from 20 field wetland transects, which will be used by SJRWMD staff to determine the targets for the Harris Chain of Lakes.

[Jim Gross, SJRWMD, provided information at the March 2012 meeting on the minimum flows and levels \(MFLs\) development process. MFLs set a limit beyond which further water withdrawals would be significantly harmful to the water resources and ecology of the waterbody. The MFLs are established using predictive mathematical models. These models also ~~to~~ are used to determine the potential effects of groundwater withdrawals on lake water levels. ~~to assess what withdrawal level results in a significant impact. Separate groundwater and surface water models are used in the evaluation with the output, and the datasets from the groundwater model providing are input into the surface water model.~~](#)

[Establishing The MFLs process for the Harris Chain of Lakes will be a more difficult process as compared to other natural lakes systems because it is a regulated hydrologic system. Work began in 2009 with ~~The initial, field intensive data collection, is very field intensive, and The SJRWMD has now completed Heeted most of the 22 soil and vegetation surveys planned for in the lake systems and the Ocklawaha River downstream of Moss Bluff the Lock and Dam. Most of the fieldwork was completed in December 2011, and tThe agency SJRWMD is currently developing the predictive models needed ing to help establish the preliminary MFLs. The remaining technical work, which includes limited the fieldwork, model development ing, and~~](#)

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~~scientific peer review, will be completed in 2013. R, and then the The rulemaking process would could begin at that time. The Harris Chain of Lakes is managed, which makes it more difficult to set MFLs.~~

*The Council recommended that the SJRWMD select Scenario A1 for the interim regulation schedule, with the caveat that the SJRWMD should establish guidelines to allow for a more dynamic management of the lake water levels to maintain levels as high as feasible while considering flood control, recreational uses, and the treatment capacity of the NuRF. The Council also requests that the SJRWMD, in cooperation with appropriate state, local, and federal agencies, focus its efforts to maintain the highest water levels achievable in the Harris Chain of Lakes during critical sport fish spawning seasons.*

**Comment [Marcy6]:** Recommendation from the June meeting.

**Comment [Marcy7]:** Last year's recommendation – also mentioned during the June meeting.

### ***3.1.1 Minimum Flows and Levels***

~~Jim Gross, SJRWMD, provided information at the March 2012 meeting on the minimum flows and levels (MFLs) development process. MFLs set a limit beyond which further water withdrawals would be significantly harmful to the water resources and ecology of the waterbody. The MFLs are established using models to determine the effect of groundwater withdrawals on lake levels to assess what withdrawal level results in a significant impact. Separate groundwater and surface water models are used in the evaluation, and the data from the groundwater model are input into the surface water model.~~

~~The MFLs process for the Harris Chain of Lakes began in 2009. The initial data collection is very field intensive, and SJRWMD collected 22 soil and vegetation surveys in the lakes and the Ocklawaha River downstream of the lock and dam. Most of the fieldwork was completed in December 2011, and the SJRWMD is currently modeling the preliminary MFLs. The technical work, which includes the fieldwork, modeling, and peer review, will be completed in 2013, and then the rulemaking process could begin. The Harris Chain of Lakes is managed, which makes it more difficult to set MFLs.~~

### **3.2 Lake Apopka North Shore Restoration**

To restore Lake Apopka to its former position of being a nationally acclaimed largemouth bass fishery, federal, state, and local governmental agencies have focused on nutrient control, primarily phosphorus. Modern-day restoration efforts for Lake Apopka began with the purchase of farmland around the lake in 1988 and have continued for more than 20 years until the present day. The SJRWMD adopted the [Lake Apopka Surface Water Improvement and Management \(SWIM\) Plan](#) in 1989 and revised it in 2003. This plan provides details on the causes of lake impairment and outlines restoration studies and projects designed to restore the lake. Also, in 2003, FDEP adopted total maximum daily loads (TMDLs) for the Harris Chain of Lakes, which limits the amount of total phosphorus loading to each lake, with the goal of removing the lakes, including Lake Apopka, from the state's list of impaired waterbodies. To implement the phosphorus reductions required by the TMDLs, FDEP adopted the [Upper Ocklawaha River Basin Management Action Plan \(BMAP\)](#) in 2007, which outlines projects and programs designed to restore the lakes.

Walt Godwin, SJRWMD, at the May 2012 meeting, reported that the SJRWMD has completed much of the work on the hydrologic interconnect infrastructure needed to manage water in the

NSRA, Duda, and Sand Farm system. The final component involves upgrading the Unit 1 pump system to discharge water into a retention area in the southern part of the Sand Farm property. Work should be completed by September 30, 2012.

The SJRWMD began flooding Phase 6 of the NSRA in January 2011 and Phase 7 in April 2011. Analyses of quarterly fish samples have indicated safe levels of pesticides for fish-eating birds. The SJRWMD received concurrence from the U.S. Fish and Wildlife Service to re-flood the remaining dry acres in the NSRA. However, re-flooding will be limited by current low water level conditions in the Lake Apopka basin.

**Comment [LHW8]:** Or dry conditions in the Lake Apopka watershed.

~~During the September 2012 meeting, Dave Walker, SJRWMD, gave an update on the efforts in the NSRA. Some natural treatment of water from Lake Apopka is accomplished by a flow-way marsh is located on the west marsh side of the NSRA (west of the Apopka-Beauclair Canal). A channel from the lake delivers water to the flow-way system, which consists of four treatment by the four individual cells. Water treated by the flow-way is pumped into the Apopka-Beauclair Canal with a portion flowing goes downstream and a portion flowings back into the lake, depending on discharges from the NuRF project. North of the flow-way, NSRA Cells F and G are the disposal site for receive the spoils from the Lake Beauclair dredging project (see Section 3.3.13.3.1).~~

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~~The SJRWMD has completed work in the NSRA (east of the Apopka-Beauclair Canal) to remediate the soils contaminated with organochloride pesticides. The SJRWMD plowed about 4,000 acres of the property to essentially “flip” the soil and bury the contaminated soils under much cleaner material. The plowing resulted in a 65% overall reduction in pesticides in this area. Based on ongoing research on safe levels of pesticides for fish and wildlife, parts of the NSRA are able to be flooded to depths greater than the previously recommended 2-3 feet. However, possible reconnection of the marshes to the lake are still some years out because the pesticide levels in fish do not meet safe levels for human health. Are still too high for human health standards, which limits the current ability to reconnect portions of the NSRA to Lake Apopka for at least 10 to 20 years.~~

**Comment [LHW9]:** Quote from the Sept minutes.

**Field Code Changed**

~~The Council recommends that the SJRWMD continue with its restoration effort to the extent that the NSRA becomes a usable tool for the restoration of Lake Apopka. The Council also recommends that options be investigated to connect the entire NSRA to Lake Apopka in a timely manner.~~

**Comment [Marcy10]:** Keep – based on March meeting

**Comment [Marcy11]:** Add to the recommendation information about creating more natural, healthy marshes in the NSRA.

### 3.3 Dredging as a Tool for Restoration

Dredging ~~to~~ the removal of organic sediments from the Harris Chain of Lakes is an important lake management/restoration tool. ~~Organic sediments need to be removed from existing canals to enhance property values, improve navigation, and re-establish fish spawning sites. The dredging of canals also permits water fluctuations to proceed without adversely affecting riparian users.~~ Removal of organic muck sediments from the lake system fosters improves the re-establishment of beneficial aquatic fish, plants providing critical habitat for and fish and wildlife habitat. ~~And where navigation is limited, dredging can be used to increase water depth. Organic sediments need to be removed from canals to enhance property values, improve navigation, and re-establish fish spawning sites. The dredging of canals also permits water fluctuations to proceed without~~

**Comment [LHW12]:** Need to first say why dredging can help restore the lakes. Canal dredging is primarily for navigation.

adversely affecting riparian users. Two dredging projects, one at Lake Beauclair and one at Lake Apopka, are currently being implemented in the Harris Chain of Lakes, as described below.

### 3.3.1 Lake Beauclair and Apopka-Beauclair Canal Dredging

The purpose of the dredging project in Lake Beauclair and the Apopka-Beauclair Canal is to improve navigation and prevent the nutrient and organic rich bottom sediments from being re-suspended by boat and wind activity. The LCWA entered into an agreement with the FWC for the sediment removal. The project was awarded to Jahna Dredging of Lake Wales, Florida in June 2011. Dredging in the lake began in September 2011 and was about 65% complete ~~in the lake~~ in June 2012. Mike Perry, LCWA, reported at the June 2012 meeting that dredging ~~would~~ stop from June 15 until the end of August because of concerns with potential low dissolved oxygen conditions during the summer months. Disturbing the organic rich bottom sediments during higher water temperature periods could further reduce dissolved oxygen concentrations, which could potentially resulting in lead to a fish kills, that, in turn, could affect the birds in the area since the fish have significant levels of herbicides in them.

**Comment [Marcy13]:** Add update when dredging starts again.

**Comment [Marcy14]:** Check with Mike Perry if this is correct – sent email on 9/13

**Comment [Marcy15]:** Last year's recommendation. Any changes?

The Council supports the ongoing dredging of Lake Beauclair and the Apopka-Beauclair Canal by the LCWA in cooperation with the FWC and SJRWMD.

### 3.3.2 Lake Apopka Dredging

In response to past Council recommendations for selected dredging of Lake Apopka, the Florida Legislature requested that UF conduct a demonstration project for lake bottom sediment dewatering systems, at Lake Apopka using the Clean to Green dredging system and Genesis dewatering solution. The Legislature asked for the cost per yard ~~of~~ dredged material and whether the cost could be reduced by ~~its~~ resale or reuse ~~of the dredged material~~. The purpose of the demonstration project is to determine if the process to be tested has possible applications for other lakes in the state with limited areas for disposal of dredged spoils, if native aquatic plants will re-establish after dredging, and if bottom sediment from other areas of the lake will migrate and re-settle in the dredged area. The proposal was to conduct the demonstration project at Magnolia Park in Orange County, with a focus on dredging the navigation channel to open water using the Clean to Green dredging system and Genesis dewatering solution.

During the permitting process for the demonstration project in 2011, Upon applying for the dredging permit from the FDEP in 2011 identified, several issues arose that prevented approval of the project, as proposed. During the July 2012 meeting, Dan Canfield, UF, reported that a new process for the demonstration project has been approved by the had been determined, the dredging permits were obtained from FDEP and the U.S. Army Corps of Engineers, and Orange County is in the process of finalizing the lease for the land needed for that will be used in the project. The dredging should begin in August or September 2012. The demonstration project will test the use of Geotubes to consolidate and store dredged materials. The Geotubes can then be used to create fish habitat in the lake. As part of the project will also determine, a determination will be made whether if the dredged material can be directly stored in the Geotubes or if the material must first be removed and dewatered. Options will also be tested to Alternatives for armoring the dredged areas to prevent refilling with bottom material will be investigated as part of the demonstration project.

**Comment [Marcy16]:** Add update when dredging starts; need to modify permits

~~In addition to the demonstration project, i~~n December 2011, ~~the~~ Lake Apopka Summit was held ~~resulting in the formation of and~~ the Lake Apopka Restoration Team. ~~The interagency restoration team was tasked with identifying projects that could be implemented using a \$4.8 million appropriation from the legislature for Lake Apopka restoration. was formed.~~ The team consists of staff from ~~the~~ FDEP, FWC, SJRWMD, LCWA, UF, ~~and~~ Orange ~~and~~ Lake Counties, ~~and~~ Lake, and their purpose was to identify projects that could be implemented using the \$4.8 million appropriated by the legislature for Lake Apopka restoration. During the July 2012 meeting, Dave Herbster, FDEP, ~~provided an update reported~~ that the projects identified ~~by the restoration team~~ for Lake Apopka ~~restoration~~ were two dredging projects: (1) expansion of the demonstration project ~~at~~ Magnolia Park, and (2) dredging at Winter Garden. The SJRWMD will be the lead ~~agency for on~~ the Winter Garden dredging ~~project. and~~ ~~the~~ dredged material ~~from this site~~ will be disposed of in the NSRA, which will help to maintain a higher elevation in the ~~restoration area~~NSRA. The ~~two~~ dredging projects also ~~will~~ include extensive planting of native ~~aquatic~~ vegetation. ~~Of the \$4.8 million appropriated to Lake Apopka, \$600,000 will be used to test innovative nutrient removal technology.~~

**Comment [LHW17]:** As part of the demonstration project?

*There is Council consensus that Lake Apopka would benefit from dredging in select areas because internal nutrient cycling appears to contribute to the lake's impairment. The Council recommends that the TAG continue to look for areas of the lake to dredge, determine the cost of the dredging, estimate the quantity of material that could be removed, and identify locations for sediment disposal. The Council further recommends that the appropriate local, state, and federal agencies review the information provided by the TAG to determine project feasibility and report back to the Council.*

**Comment [Marcy18]:** Last year's recommendation. Any changes?

### 3.4 Vegetation Mapping

Nathalie Visscher, FWC, ~~gave a presentationed~~ on FWC's ~~aquatic~~ vegetation mapping ~~program~~ at the Council's January 2012 meeting. In July 2011, ~~the~~ ~~vegetation~~ surveys ~~were~~ conducted on Lake Harris, Little Lake Harris, Lake Eustis, and Lake Griffin. The purpose of the mapping was to ~~provide a baseline condition of determine~~ how much vegetation was present in each lake and the types of ~~aquatic plant~~ species ~~observed~~. The mapping started at the shoreline and continued to the middle of each lake. ~~Both emergent and submergent aquatic vegetation was mapped and with the findings entered into a geo-referenced database for display and analysis using a geographic information system.~~

**Comment [LHW19]:** Not a baseline survey since surveys were also conducted in 2003 and 2006. Data are used to establish spatial trends rather than a baseline.

The survey found that 24% of Lake Harris', 25% of Little Lake Harris', 27% of Lake Eustis', and 27% of Lake Griffin's ~~spatial area~~ had aquatic vegetation present in July 2011. ~~The findings were compared to the results of s~~Surveys ~~were previously~~ conducted in 2003 and February 2006. The acreage of aquatic vegetation present ~~in~~ the lakes has been increasing with each survey. The Council members noted that it would be useful to have a consistent approach for the vegetation mapping from year to year to ensure the data are comparable. The Council commented that the difference in vegetation acreage between the February 2006 and July 2011 surveys could be the timing of the survey, because the July survey would have occurred during the growing season.

**Comment [LHW20]:** Need to add the month.

**Comment [Marcy21]:** Need a recommendation from the Council, if the members want to provide one.

**Comment [LHW22]:** Suggest the Council offer support for the collection of seasonally comparable, time-series data sets on the spatial occurrence of aquatic plants as one of several metrics used to assess overall lake health and conditions, as well as effectiveness of the restoration program for the chain of lakes. All agencies collecting aquatic plant occurrence data should follow a common protocol with geo-referencing to enable the sharing and geospatial analysis of the consolidated, inter-agency aquatic plant occurrence database.

*The Council recommends*

### **3.5 Invasive Aquatic Plant Management**

During the September 2012 meeting, Nathalie Visscher, FWC, presented the agency's FWC's invasive aquatic plant management plan for the Harris Chain of Lakes for the upcoming fiscal year. Each spring, the FWC estimates the level of aquatic plant control management that will be needed and uses these estimates to develop in order to create management plans and budgets for the upcoming year for each lake in the state. The aquatic plant acreages of aquatic plants needing control for each lake for management each year are estimated based on using past actions information from the management that occurred in past years, present lake conditions, and other activities that are occurring in the watershed.

The funding for invasive aquatic plant management for fiscal year 2012-2013 is less than in past years; therefore, the FWC will not be able to address manage excessive plant growths in some of the residential canals that were previously managed. At least for now, this will be the responsibility of local government and property owners. Current plans for next year call for the control of The estimated acreages for management in the Harris Chain of Lakes are about 2,000 acres off hydrilla and about 200-265 acres off floating plants in the Harris Chain of Lakes. Funding for management is assigned to each lake; however, the FWC can move the funding between lakes in an area if the cost for invasive aquatic plant management warrants greater action on a particular lakewas underestimated on one lake while overestimated on another lake.

The Council recommends

#### **3.5.3.6 Mechanical Harvesting of Nuisance Aquatic Vegetation**

In January 2007, the Council purchased a mechanical harvester utilizing \$25,000 in Legislative appropriations. The harvester is maintained and operated by UF's LAKEWATCH volunteers, and used to remove near shore, nuisanceinvasive aquatic vegetation at the request of property owners and homeowner associations throughout Lake County. This program has been very successful at maintaining waterways and, based on the high demand for its services, has proven to be very popular with the citizens of the county. However, the mechanical harvester now requires significant maintenance and repair due to its ageis old and keeps breaking down, which limits how often it can be used.

The Council recommends

#### **3.5.3.7 Sport Fish Stocking**

Dennis Renfro, FWC, at the April 2012 meeting stated that the FWC stocked 140,000 Phase II largemouth bass, which were approximately four to five inches long, into Lake Dora. In addition, 300,000 sunshine bass have been stocked into Lake Apopka. Dave Douglas, FWC, stated at the May 2012 meeting that 109,000 sunshine bass have been stocked into Lake Harris.

During the September 2012 meeting, Brandon Thompson, FWC, provided an update on the agency's study of stocking the Phase II bass, which are advanced fingerlings approximately 4 inches in lengthstocking, in the Harris Chain of Lakes. The FWC conducted a research project study was conducted duringin 2009-2010 on Lake Carlton, which was selected because its vegetation was similar to the other lakes in the Harris Chain of Lakes. The FWC tagged both

**Comment [Marcy23]:** Need a recommendation. Proposed language from September meeting for discussion: "The Council encourages the Legislature to establish a contingency fund of \$1 million for a pilot program on the Harris Chain of Lakes for FWC aquatic plant management to be able to react to excessive plant growth in the lakes."

**Comment [Marcy24]:** Dan Canfield suggested at the March meeting that at least 3 machines are needed to meet the demand; appropriation to buy at least one machine – need a cost

~~hatchery fish and wild bass, which were transported from a different lake, and tracked the fish daily over a period of every day for 30 days. At the end of the study period, FWC determined that the wild bass had significantly higher survival and growth rates than the hatchery bass. This difference was attributed to the conditions in which the hatchery fish were raised; therefore, the FWC conducted studies to further investigate the effect of conditioning the hatchery-raised bass in predator free nets within the lake prior to being released in order to determine if a determine if a greater survival and growth rates could be achieved.~~

~~The FWC created research ponds to compare the success of stocking hatchery-raised fish that had been conditioned in a conditioning pond for 10 days prior to release to the success of hatchery-raised fish that were released directly from straight out of the hatchery. From this study, it was determined they found that conditioning the hatchery-raised fish resulted in almost double the survival rate and faster growth. To further test the success of stocking the conditioned largemouth bass, the FWC is conducting a follow-up small lakes study where they stocked 11 small lakes were stocked in the spring of 2012 and will evaluate the success in 2013 and 2014. The survival rates and growth rates of the conditioned fish will be evaluated over two years with the results used to improve future stocking efforts. results of this study will help to inform managers for future lake stocking decisions.~~

~~Mr. Thompson also reported on the Harris Chain of Lakes, FWC has been studying the largemouth bass population data collected by the FWC for the Harris Chain of Lakes since 2007. Lakes Eustis, Harris, and Dora have had consistently higher populations of bass as compared to the other lakes in the chain, whereas the lowest bass populations are found in Lake Apopka have consistently been the lowest in the chain. In recent years, there has been an increase in the number of bass observed in Lakes Griffin and Beauclair. The FWC will continue collecting comparable data their monitoring and surveys induring the upcoming years in order to track the fish populations.~~

*The Council recognizes that restoration of the Harris Chain of Lakes will most likely take decades to achieve and believes funding the transfer of native largemouth bass from other waterbodies to the Harris Chain of Lakes as well as stocking hatchery-raised fish is important to support the sport fishing recreation industry in the region until aquatic habitat can be restored and a sustainable, highly productive fishery is achieved. The most cost effective measure to maintain the economic vitality of the largemouth bass fisheries in the lakes is to support stocking programs. The Council, therefore, recommends an annual appropriation of \$150,000 for the continuation of the bass stocking program for the Harris Chain of Lakes.*

**Comment [Marcy25]:** Last year's recommendation. Any changes?

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