

**MINUTES OF THE MEETING
of the
HARRIS CHAIN OF LAKES RESTORATION COUNCIL
March 4, 2016**

The regular meeting of the Harris Chain of Lakes Restoration Council (Council) was held at 9:00 a.m. on March 4, 2016 at the Lake County Board of County Commissioner Chambers, 315 West Main Street, Tavares, Florida.

Council Members Present

Robert Johnson, Chairman
Skip Goerner, Vice-Chairman
Keith Truenow

John Stump, ex officio member

Council Members Absent

Sid Grow
Hugh Davis
Dr. Ed Schlein
Don Nicholson
Stephanie Bishop

TAG Members Present

Roland Fulton (SJRWMD)
Dennis Renfro (FWC)
Kevin Coyne (DEP)
Mike Perry (LCWA)

TAG Members Absent

Mark Hoyer (UF)
Stephen Tonjes (FDOT)

1. CALL TO ORDER

Chairman Johnson called the meeting to order at 9:00 a.m.

Chairman Johnson displayed two glass containers of water noting the yellowish colored water was from Lake Apopka near Magnolia Park. The second sample was what the water looked like after sitting overnight. Chairman Johnson suggested wind caused the differing colors in the water, which Chairman Johnson noted was a major problem with the lake.

2. INVOCATION AND PLEDGE OF ALLEGIANCE

Chairman Johnson called for a moment of silence. The Pledge of Allegiance followed.

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

Chairman Johnson called the roll. Council members Grow, Davis, Schlein, Nicholson, and Bishop were absent. Mark Hoyer (UF) and Stephen Tonjes (DOT) of the Technical Advisory Group (TAG) were absent.

4. APPROVAL OF MINUTES

Discussion and approval of the February 2016 meeting minutes. Chairman noted absence of a quorum; therefore, the February 2016 minutes could not be approved.

Chairman Johnson noted a correction on page 2 of the minutes. He was incorrectly listed as introducing the speaker Bob Naleway.

Councilman Goerner commented he had requested detailed minutes as there were some statements by Dr. Rolland Fulton regarding the amounts of water pumped from the north shore restoration area (NSRA) in acre-feet. Councilman Goerner requested the subject data be included in the minutes, and a copy of the presentation provided, if available. Dr. Fulton responded there was no presentation only data.

Chairman Johnson noted on Item 7, there was a discussion of an article in the Orlando Sentinel that he would like to see. Susan Davis reported it was sent via email.

Denis Frazel, Harris Council Administrative Support, acknowledged he would restate the minutes as requested.

5. PUBLIC COMMENTS

Chairman Johnson reported public comment will be moved to the end of upcoming agendas to facilitate public comment on agenda items presented on that day.

Lynda Bystrak, citizen. Ms. Bystrak discussed Apopka springs, the use of reclaimed water and irrigation, and rapid infiltration basins. She expressed concern of higher nitrate concentrations in reclaimed water and suggested the District use dye tests to determine if water was entering Lake Apopka. Ms. Bystrak discussed concern regarding the closure of certain trails until 2017 in the Emerald Marsh Conservation Area. Mr. Dennis Renfro, FWC, advised the new wildlife drive will be longer and bigger; however, the viewing tower will be removed due to unsafe conditions. A number of viewing islands will be constructed to expand birding opportunities.

Chairman Johnson requested Susan Davis to have the meeting minutes be forwarded to him earlier so he could make comments. Councilman Goerner also asked to see the minutes earlier, if possible.

6. PRESENTATIONS / ACTION ITEMS

A. Using Nature to Restore Lakes & Canals–Jay Barfield and Eric Endicott, Allied Group USA

Chairman Johnson introduced speakers Jay Barfield and Eric Endicott of the Allied Group. Councilman Goerner asked for information about the Allied Group. Jay Barfield, Allied Group, introduced himself, and his business, noting the Allied Group primarily builds water and wastewater plants. Mr. Barfield introduced and began to discuss two technologies, CleanFlo and HydroFlo, both being tested in Lake Apopka. Allied Group is working with FWC and other agencies to improve the water quality of the lake. Mr. Barfield noted Allied uses a chemical free process to improve the environment. Mr. Barfield introduced Eric Endicott, a Georgia-Tech engineer, and the Chief Operating Officer of Allied Group who oversees day to day operations. Councilman Goerner inquired as to what type of engineer. Mr. Endicott noted he was an electrical engineer.

Mr. Endicott presented a slide showing typical projects and clients of Allied. Councilman Goerner noted their focus included non-chemical processes in wastewater and inquired as to what lakes Allied had worked on, as he had his own sewage treatment plant and was familiar with the process. Mr. Barfield noted the technology had been used more in Asia than in the United States. Mr. Barfield discussed Lake Brown, in Osceola County, a 60-acre lake with fecal problems from runoff. A private business on the lake had lost its Department of Health permit to for swimming.

Mr. Barfield reported Allied had worked on the private side dealing with high biological oxygen demand (BOD) and nutrients, and modifying equipment to clean water before dumping with no

chemical oxygen demand (COD). Allied began working on lakes and lagoons two years ago after a meeting with Senator Hays. Allied has since been working with the Florida Department of Agriculture (FDACS) and FWC. Allied is currently working on projects at Magnolia Park and Newton Park through FWC using the two technologies. Councilman Goerner assumed the Allied client list was mostly wastewater treatment. Mr. Barfield noted Allied Group works in both the water and energy and mostly deals with wastewater. Councilman Goerner again noted he was familiar with wastewater and inquired if they were introducing bacteria or using existing bacteria. Mr. Barfield described the Allied system as similar but with a different delivery method that removes nitrate and phosphorus and reduces BOD and COD, all cause of Lake Apopka to be eutrophic. Councilman Goerner asked if Allied utilized air pumps to artificially raise dissolved oxygen (DO). Mr. Barfield indicated allied uses a proprietary microporous laminar flow oxygenation and diffuser system similar to an aeration stone. Mr. Endicott noted Allied introduces a bacteria that requires aerobic conditions. Mr. Barfield noted Allied's current work was sponsored through Senator Hays. Chairman Johnson noted the Council has been trying to get Representatives Metz and Sullivan involved in Lake Apopka.

Mr. Endicott presented his second slide showing an aerial image of Lake Apopka and the location of the aeration stone study area in the northeast corner of the lake. Mr. Endicott discussed Lake Apopka background, noting it was a 31,000-acre lake in which muck farming had begun on the shores of the lake in the early 1900's. The fertilizer runoff from these farms, and those of surrounding orange groves led to a permanent blue-green algae bloom, with near zero DO at the lake bottom. Mr. Barfield reported they were the only group testing DO at the lake bottom; however, Mr. Renfro, FWC, also reported FWC takes water column samples. Councilman Goerner inquired what species of blue-green algae. Mr. Barfield responded there were 30 species in the lake, but he did not have information on the particular species. Mr. Endicott continued the presentation on Lake Apopka background, noting the lake contained a large amount of unconsolidated muck with depths ranging from 3 to over 17 feet, which resulted in a loss of fish camps and other recreational and economic activities. The alkalinity of the lake water was very high with a pH greater the 9.0. Allied suspected the high pH was introduced by lime placed on the muck to facilitate plant growth. Chairman Johnson noted the pH on the muck farms was not 9.0. Councilman Truenow reported the pH was similar in most soils below the muck.

Mr. Endicott discussed a slide of the Magnolia Park Project, reporting a 250-acre treatment area in which 99 microporous ceramic diffusers were installed. The plan is to apply bioaugmentation after 30 days once the muck is aerated. About 5 cubic feet per minute of air is delivered to the diffusers, which turn over about 100,000 gallons per hour of water. John Stump inquired why the large influx of oxygen would not cause more bloom. Mr. Barfield noted anaerobic bacteria were consuming the muck. Mr. Endicott remarked the bacteria were reintroduced in tablet form at the diffusers to disperse the bacteria. Mr. Stump inquired how flow was regulated. Mr. Endicott noted pressures were equalized below open areas under each diffuser. The project is contracted to last 10 months.

A slide showing laminar flow inversion and oxygenation was presented by Mr. Endicott detailing the transition from eutrophic waters to a Clean-Flo natural inversion of pond waters. About six inches of muck is expected to be oxidized in 30 days. Mr. Endicott also noted an increase in benthic organisms, worms and other invertebrates. Councilman Goerner asked if the diffusers are a permanent solution. There was general discussion about nutrient transport in the lake and the removal of nutrients by gill netting gizzard shad. Councilman Goerner asked about the bycatch during gizzard shad gill netting.

A series of slides were presented showing changes in the bottom topography representing depth of the muck layer over time in the vicinity of the aerators. Councilman Goerner commented that winds in

that area can transfer muck out of the area. Mr. Endicott noted water levels were normalized to remove lake level variations by rainfall. Approximately 4-6 inches of muck have been reduced to inorganic mineral-type material in the four months of testing so far. A slide showing bio-volume \ demonstrated reductions in the flocculent layer (unconsolidated material) in 4 months. Mr. Barfield stated in response to Councilman Goerner's question on timeframe, the aerators would be a permanent fixture in the lake. The best estimate was about 50% of the lake coverage to clean the entire lake at a cost of \$50 million over 4-5 years. The cost per year to maintain on 250 acres was estimated at \$6,000, but long-term would be about \$3,500 per month.

Councilman Goerner inquired about nutrient treatment as phosphorous is the limiting nutrient for plant growth in the lake. Mr. Barfield noted they have had minimal effect on phosphorus thus far but have reduced total nitrogen. They did not expect to have great changes this early in the project. Chairman Johnson asked how the process would work with parabolic wedgewire screens. Councilman Truenow asked how much phosphate is released in this process. Mr. Endicott reported phosphate amounts would increase as bacteria release it from the bottom, but then it will decrease as it becomes mineralized.

Mr. Endicott described a slide of bottom hardness changes between May and December 2015. As the process is evolving, Allied is finding sediments changing from unconsolidated muck, to consolidated muck, to a layer of cattails roots which may be several feet thick. Water is not penetrating the cattail roots. Mr. Barfield remarked the cattail roots would decompose eventually but it would take much longer. Councilman Truenow again asked if phosphate would be released from this material. Some gets resuspended, but some gets remineralized. Mr. Endicott noted a deep area he speculated may have some spring flow, as no unconsolidated material appear to migrate to that area. Councilman Goerner asked if the potentiometric surface pierced the surface. Dr. Fulton remarked SJRWMD did not have detailed information on the potentiometric surface in that area.

Mr. Endicott presented a series of overlay maps showing a contour-biovolume overlay and a contour-hardness overlay. The biomass appears to follow the diffuser line, while on the hardness overlay, the deepest area is getting the most compression of material. Mr. Endicott described biovolume primarily as the floc layer and muck layer above hard bottom. Mr. Stump asked if the whole lake had been surveyed to determine that only 50% of the surface area would need to be treated. Mr. Endicott noted the environmental firm Eklund had surveyed the bottom and found large areas of hard pan bottom with no muck. These areas stayed clear due to the eddy currents in the lake. Mr. Endicott noted Allied would like to survey the currents in the lake to capitalize on water flow in those areas to maximize their treatment. Chairman Johnson asked if Allied had surveyed in the lower portion. Mr. Barfield reported they had not surveyed there and were not measuring nutrients. Dr. Fulton remarked spring flows varied according to rainfall, and were down during drought years. Dr. Fulton responded to a query by Councilman Goerner that SJRWMD did not have data about spring flows in that area. Mr. Stump asked if nutrient data was being collected on the lake. Mr. Renfro reported FWC monitoring nutrients under contract to the University of Florida (Mike Allen's staff). Data will be available at the end of the study, in May 2016. Mr. Renfro estimated about two months for data to be evaluated prior to release. Mr. Barfield noted Allied has retained an independent limnologist who is collecting samples at 15 sites in the study area and 8 sites outside of the study area. Restorative Lake Sciences (Jennifer Jones from Michigan, principal investigator) is the limnological contractor.

On a separate note. Mr. Renfro commented FWC uses the same BioBase analyses used by Allied. FWC uses the data for hydrilla areal estimates to maximize chemical treatments. Chairman Johnson

inquired as to the herbicides used. Mr. Renfro did not have the immediate answer, but subsequently reported the chemicals used for treatment of hydrilla on the Harris Chain are mostly Aquathol K, sometimes superK and combination of Aquathol K and penoxulam. Treatments are supervised by FWC.

Mr. Endicott showed photographic results of unconsolidated muck before and 30 days after treatment. Unconsolidated muck has essentially disappeared from the treatment area. A separate slide showed exposure of cattail roots as the muck was degraded. With no holdfast, cattails float to the surface and die. Mr. Endicott noted experiments were underway in Pennsylvania to identify bacteria that will quickly consume cattail roots. Two unidentified strains show possibilities. Mr. Endicott also presented a series of photographic results of treatment at other lakes. Mr. Barfield about a 50% removal of Total Phosphorus and Total Nitrogen after 1.5 years because of food source removal. In closing, Mr. Endicott reported the occurrence of eel grass in the area.

7. COUNCIL & AGENCY QUESTIONS & ANSWERS

Chairman Johnson presented a copy of the Florida Statutes, noting it was not totally like the one in the annual report, so he printed it off the Florida Senate Web site. The printout was distributed to all members. The Chairman noted a couple of items were different, including the setting up of this committee. The Chairman read the following differences: the Harris Chain of Lakes Council shall review existing restoration proposals to determine which ones are the most environmentally sound and economically feasible, to initiate the Harris Chain of Lakes restoration program recommended by the Harris Chain of Lakes Council, the Fish and Wildlife Conservation Commission, with assistance from St. Johns, shall develop tasks. The Chairman remarked that basically we (the Council) are in charge of making plans, but the only way we (the Council) can make plans because of no scientific background is to rely on St. Johns, and Game and Fish, they have to present proposals of what they plan to do in the future, that will be discussed at a later meeting. The Chairman noted some of these plans had been presented in 2009 at a public meeting in Tavares, where public input was presented. The Chairman referred to the April 2009 Harris Council Summary (minutes) that presented information from that meeting.

In addition, the Chairman noted Senator Hays had two Tiger Team meetings, one in Clermont (attended by the Chairman, and perhaps Councilman Goerner) and one in Winter Garden. The meeting included public and TAG input. Chairman Johnson stated the Council needs to review that input. Chairman Johnson advised the major issue from those meetings was to reconnect the north shore. The Chairman recited a question from Councilwoman Bishop from the February meeting minutes stating, Councilwoman Bishop did not think the entire Council as a whole agreed with the notion of reconnection. Councilwoman Bishop noted she had not seen any previous presentations in support of restoration. Chairman Johnson further advised that SJRWMD used the reason for buying the farmers out was to reconnect the lake to the north shore. The legislature approved the money based on reconnecting the north shore. Chairman Johnson contended the University of Florida (UF) contends the only way to revitalize Lake Apopka is to reconnect the lake to the north shore and reports back that up.

Chairman Johnson expounded on the following: When there is no water on top of organic matter it releases phosphate, the organic matter is made by plants. The plants take up the phosphate, and when they die, they decompose and release the phosphate. By not keeping part of the north shore underwater, phosphate is being released. Some came from farmers some comes from under the surface. Scientifically leaving it open is creating more phosphate.

Chairman Johnson and Councilman Goerner stated opinions on the SJRWMD and reconnection of the north shore restoration area to Lake Apopka. Councilman Goerner noted St. Johns sold it to us (the Council) and the legislature that the reason the north shore needed to be bought was to reconnect the marshes, to make them a natural system. Either it was a lie by St. Johns, or it was a fraud. So, if saying it is not necessary to reconnect the marshes we spent hundreds of millions of dollars on purchasing the farms and lost more in taxes from the farmers. Not to reconnect the marsh—people should be prosecuted. Chairman Johnson noted the Council has teeth, the statute gives the Council teeth, and we (the Council) can pursue that situation through the Florida legislature or through the court system, which has been done in the north Ocklawaha section that created problems for the water management district when that was taken to court. Councilman Goerner noted everyone agrees shorelines should be kept natural in the lakes, because it is a filtration mechanism. Councilman Goerner explained that if having a marsh on the north shore is not necessary why should there be shoreline ordinances. Chairman Johnson requested that copies of the April 2009 minutes be distributed to Councilmembers. The minutes include a summary of what the public wanted to do to clean up Lake Apopka. Councilman Goerner noted questions last month as to whether to connect the marsh should not be a question. If we do not reconnect the marsh, then the District has perpetrated a fraud of millions on the purchase of those farms.

Chairman Johnson noted one reason to not reconnect was the high pesticide concentrations and noted he had not seen any recent numbers. Dr. Fulton reported the District does periodic pesticide testing in the sediments, and he would provide the information. Chairman Johnson requested he be present when the findings were discussed. Dr. Fulton noted the District has recently shifted to sampling fish rather than sediments and could present results at a future meeting.

Chairman Johnson noted the receipt of information provided by staff from the Department of Health's (DOH) current fish consumption advisory on Lake Apopka. The advisory was based on 2007-2008 samples, with consumption rates varying from 1 to 2 fish meals per week, to 1 per month, depending on species. The report was unclear as to when the fish were sampled and what types of pesticides were analyzed. Councilman Goerner noted the report was an advisory and not a restriction. The Councilman further noted there were no restrictions on the commercial sale of fish from the lake and that fish were sampled from the lake and the marsh.

Councilman Goerner queried Dr. Fulton on fish sampling, asking if samples were whole fish or fillets. Dr. Fulton thought the District was sampling whole because of the bird issue. Councilman Goerner also requested the most recent survey data on ducks (edible birds). Dr. Fulton reported the fish in the DOH report were collected by the District, provided to FWC, and then transmitted to DOH.

Councilman Goerner requested that Dr. Canfield present to the Council on reconnection at some future date. Councilman Goerner and Chairman Johnson discussed varying lake water levels since farms were purchased. Chairman Johnson noted the Zellwood Drainage District engineer reported the dike leaks like a sieve, and that farmers constantly had to pump water back into the lake.

Chairman Johnson inquired about the large tank the City of Apopka uses for irrigation and where the water comes from. Dr. Fulton reported the water comes from the north shore. The Chairman further inquired about the where rainfall on the north shore ends up.

Chairman Johnson inquired who receives the annual reports. Susan Davis, SJRWMD, reported one copy each goes to the heads of the House of Representatives and Senate. The remainder were provided to Councilman Goerner. Chairman Johnson requested hardcopies be sent to local legislators and the last 2 years of reports to District Governing Board members.

Dr. Fulton proceeded to show a current configuration of the north shore drainage, and described water flow back into the Lake. Chairman Johnson noted pesticides must not be an issue if water was being pumped back into the lake. Dr. Fulton noted there was some pumpage this year, and some the previous year. In some years there was no pumpage.

Chairman Johnson stated the Council is charged with, based on the statute, with making a plan for the future. The only way is to get priorities from the various agencies involved, including St. Johns, Fish and Wildlife, and DEP. The Council needs to discuss at a future meeting how to get these plans on a one-page document listing priorities and costs. Chairman Johnson and Councilman Goerner discussed farming practices and the history of the farm buyouts on the north shore.

Councilman Goerner asked if the flow way does not remove phosphorus then why is it still operating. Dr. Fulton reported the flow way is removing phosphorus. The water levels are such that it is a shallow marsh. It is just not reconnected. Dr. Fulton noted the water is treated with alum to help remove nutrient. In response to a query by Councilman Goerner about reconnection, Dr. Fulton noted the marsh is being maintained at a low water level to keep it a marsh. If water levels were raised to the level of the lake, it becomes open water with no marsh. Most cells are now flooded.

Mr. Renfro reported the Area 3 project is ready once the final permit is received. Hydrilla on Lake Griffin will be addressed during the month.

Kevin Coyne, DEP, noted he would look into DO sampling on lakes. Chairman Johnson and Councilman Goerner both acknowledged the importance of input from DEP on Lake Apopka.

8. COUNCIL MEMBER COMMENTS

A. Chairman Johnson apologized for missing the previous meeting but noted he was judging a local science fair. Chairman Johnson discussed the quality and variety of projects and lack of state science fair funding.

A. The Next Scheduled Meeting is tentatively scheduled for April 1, 2016.

9. ADJOURNMENT

The meeting adjourned at 11:12 a.m.