

FINAL

**MINUTES OF THE MEETING
of the
HARRIS CHAIN OF LAKES RESTORATION COUNCIL
February 6, 2015**

The regular meeting of the Harris Chain of Lakes Restoration Council (Council) was held at 8:59 a.m. on February 6, 2015 at the Lake County Board of County Commissioner Chambers, 315 West Main Street, Tavares, Florida.

Members Present

Skip Goerner, Chairman
Robert (Bob) Johnson, Vice Chairman
Keith Truenow, Secretary
Don Nicholson
Sid Grow
Stephanie Bishop

Members Absent

Hugh (Dave) Davis II
Dr. Ed Schlein

John Stump, ex officio member

1. CALL TO ORDER

Chairman Goerner called the meeting to order at 8:59 a.m.

2. INVOCATION AND PLEDGE OF ALLEGIANCE

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

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

Chairman Goerner called the roll. Council members Davis and Schlein were absent. Christianne Ferraro (FDEP), Stephen Tonjes (DOT) and Mike Allen (UF) of the Technical Advisory Group (TAG) were absent.

4. APPROVAL OF MINUTES

Chairman Goerner stated that TAG members should not have schedule conflicts because they are given advanced notice of Council meetings and emphasized the importance of their attendance at the council meetings. The Council did not approve meeting minutes from October 30, 2014, and January 9, 2015. Chairman Goerner asked for the minutes to be more detailed. Vice Chairman Johnson stated that Rolland Fulton, St. Johns River Water Management District (SJRWMD), previously reported that Exponent did not find a cause for the pelican mortalities. He indicated that he wants the October 30, 2014, meeting minutes reflect his rebuttal. He explained that the Exponent document reported that several aspects of the factual evidence are not consistent with the hypothesis that pesticide exposure was responsible for mortality and that they did not know what caused the deaths.

5. PUBLIC COMMENTS

There were no comments from the public.

6. PRESENTATIONS / ACTIONS

- A.** Kraig McLane, SJRWMD, distributed a list of questions he received from Chairman Goerner. Jay Brawley, SJRWMD, reported on daily water levels and noted that they are available on SJRWMD's website. The water level in Lake Apopka is below the minimum desirable level and the structure is closed. The water level in the Superpond (Lakes Eustis, Harris and Dora) is at regulation schedule. The water level in Lake Griffin came close to the maximum desirable level, but a water release returned the level to the regulation schedule's level. He discussed flood releases and attributed the specific cause of erratic changes in Lake Apopka's water level to wind, not water leakage. He indicated SJRWMD monitors the flow of water out of Gourd Neck Spring and that he will provide the Council with the information about the monitoring frequency. He indicated that updated minimum flows and levels (MFLs) data is expected available in a couple of months, following SJRWMD's computer models revisions, internal review, and report writing. SJRWMD staff will be producing a written water resources value report and holding public workshops. Computer models of Lake Yale and Lake Apopka, which were previously separated, have been added to form a complete system from Lake Apopka to Moss Bluff, including Lake Yale. The City of Lake Apopka has a consumptive use permit (CUP) that allows augmentation for a reclaimed water facility and irrigation, although the permits does have some restrictions. The first priority is whether Lake Apopka has enough water in it. The second priority is whether the North Shore has enough water in it. The third priority is whether there is availability of water for the reclaimed water facility. Water will only be available for augmentation if those conditions are met. Mr. Brawley agreed to provide Chairman Goerner with copies of the CUPs and memorandum of agreement, which lists the restrictions. Chairman Goerner stated that he is concerned about water not being pumped from the North Shore area into Lake Apopka. Mr. Brawley explained that water is being pumped from the Duda Pond area of the North Shore through an alum system and a weir, and into Lake Apopka. Chairman Goerner, asked for the amount of water being pumped and for this to be provided at the next meeting. Chairman Goerner stated that he is interested in the impact of CUPs on the area for which the MFLs are being developed. Mr. Brawley explained how CUPs affect ground water and ground water affects potentiometric surface. CUPs and well data are part of the groundwater model that interfaces with the MFL model. Mr. Brawley stated that he would provide the Council with that information after checking the geographic areas which interface with the MFL model. Chairman Goerner stated that he wants to discuss the MFLs at the next meeting and that there has not been enough information provided for the Council to make a recommendation on the MFLs. Mr. Stump asked at what interval the potentiometric (POT) service maps are prepared and if this information is available the public. Mr. Brawley agreed to check on the plotting frequency and to provide that information next month. Kraig McLane distributed questions from Vice Chairman Johnson.
- B.** Mike Coveney, SJRWMD, presented an overview of Lake Apopka North Shore pesticide research. Council members have questioned historic farming, land elevations, subsidence and current flooding on the North Shore so these topics were at the forefront of the discussion. The discussion covered the bird mortality in 1998-1999, ensuing research by SJRWMD and National Resource Conservation Service (NRCS), remediation of soils, and continued rehabilitation. He explained that the extent of farming has changed through the years. There was an interest in farming the peat soils in the late 1800s. The Mendenhall survey of 1919 shows ongoing drainage for the area that became Unit 1 of the Zellwood Drainage and Water Control District. Aerial photography from 1941 shows the whole area as shallow marsh. Farming operations prior to this must have been unsuccessful and short-term. By 1947 after construction of a dike that separated this area from Lake Apopka, some areas were in agriculture and some were drained. Further development of farms occurred in the

1950s with almost full development by 1985. Vice Chairman Johnson recommended a history book by Henry Swanson. Mr. Coveney discussed historic reflooding of the property and estimates the extent of farming to be 15,660 acres. Mr. Coveney stated that SJRWMD had approval to flood it by 2013. SJRWMD relied on rainwater for flooding and did not take water from the lake. As of today, the entire area is flooded except for the former Bass sod farm, which is at too high an elevation. This area is leased. SJRWMD does not want to flood other areas any deeper because of concerns for pesticide residues. Chairman Goerner stated that he estimated the extent of farming to be less than half of the stated amount and Vice Chairman Johnson estimated farming of 14,000 to 15,000 acres. Mr. Coveney explained elevation is not shown on the 1919 survey and a rough approximation of the elevation of the marsh prior to farming is 66.5 feet in the NAVD88 datum. He estimates subsidence as varying from 6.5 feet to approximately 10.5 feet and attributes this to oxidation through years of farming.

The bird mortality event occurred despite rigorous site assessments, remediation, & ecological risk assessments, none of which predicted mortality. There were concerns for long-term reproductive effects on birds, but not birds dying. SJRWMD drained the fields and concluded that organochlorine pesticide (OCP) residues were responsible, in part, for the bird mortality. SJRWMD and NRCS conducted a research program on distribution, bioaccumulation, and the fate of pesticide residues in organic soils. A common denominator was that almost all mortality was among fish eating birds. Tabulation of bird mortality on site revealed 441 white pelicans, 135 herons and egrets, 43 wood storks, and 57 birds of other species. SJRWMD and NSRA had to research the accumulation of lethal OCP levels in birds and restoration of wetlands with acceptable risk. In determination of the restoration of wetlands with acceptable risk, SJRWMD researched the availability of weathered soil OCPs to biota, the transfer of OCPs from soil to fish and fish to birds, the role of soil total organic carbon (TOC) and OCP levels in determining exposure, and the distribution of OCPs among bird tissues. Research by SJRWMD and NRCS included formation of a Technical Advisory Group, an Expert Review Group, large-scale sampling of soils, contracting with Exponent for forensic analyses, and pesticide bioaccumulation studies of soil to fish and fish to birds. Various agencies, local governments, and organizations cooperated with SJRWMD and NRCS. Pesticides of interest included the DDT family (4, 4'-DDD, 4, 4'-DDE, 4, 4'-DDT), chlordane compounds (alpha-chlordane, cis-nonachlor, gamma-chlordane, heptachlor, heptachlor epoxide, oxychlordane, trans-nonachlor), Dieldrin, and Toxaphene. Toxaphene is not one chemical and, potentially, can be over a thousand different chemicals. Toxaphene is difficult to measure because it varies much and as it weathers it varies. SJRWMD conducted comprehensive resampling of the soils in stages from 1999 through 2001. The distribution of toxaphene revealed universally low levels at the former Duda Farm property, higher concentrations in many other parcels, and very high concentrations at one site on the former Lust Farm Property, not immediate adjacent, but along side an airstrip that was used for crop dusting. Ultimately, a number of acres of surface soil from the Lust airstrip site were removed. SJRWMD does not know the origin of that contamination or if the area was flooded. He confirmed no known fish kills.

Vice Chairman Johnson stated that, by that rationale, it should not be toxic to birds and Exponent does not know what caused the kill because they were not given adequate time. Exponent gave six reasons pesticides did not kill the birds and there were no bird deaths in Audubon's summer bird counts. He believes there will be more bird deaths at Lake Apopka in the future due to Newcastle disease, Salmonella, and Botulism. He referenced articles from 2002 and 2003 regarding the death of nearly 10,000 pelicans across the United States.

Mr. Coveney clarified that SJRWMD's remediation was justified by resampling of soils, examination of toxicological endpoints for concentrations of residues in fish and fish eating birds, and the determination that residues were high enough to cause ecological harm. Vice Chairman Johnson reiterated that this is inconsistent with reports by Exponent and EPA, and that U.S. Fish and Wildlife Service did not allow additional sampling because they were going to put people in jail. He said there is going to be another bird kill and asked if that would result in another 20-year study.

Mr. Coveney emphasized that the basis for SJRWMD's decision for remediation, before continued reflooding, was subsequent research that showed that residues were high enough to be harmful. There have been other occasional bird deaths since 1999, but not mass mortalities. The current process for a recovered carcass is freezing, necropsy, and testing. He confirmed permissions to collect bird carcasses and collection of carcasses unless there is an obvious cause of death (burnt and under a power line). Botulism is more common in Western States, rare in Florida, and has to do with the strains of botulinum bacterium that produces the toxin. One of the few reports of botulism toxicosis in Florida in birds was at the Ocklawaha Prairie, which was collected and tested by SJRWMD.

Secretary Truenow stated farmers were harmed by the perception that pesticides killed the birds and this misperception was not corrected. Chairman Goerner emphasized concern for ongoing maintenance of an isolated marsh, Apopka's small drainage basin, and 22,000 acres that is not contributing to the health of that Lake. Mr. Coveney explained management of the marsh by impounding runoff and the ability of the wetland to remove nutrients. Chairman Goerner reiterated that Lake Apopka does not have the ability to recover because the rainfall on areas 22,000 acres, which is billions of gallons water does not get to the lake because it is in a marshy area that does not recharge. Mr. Coveney compared the former use of water from Lake Apopka for agriculture to current impoundment for use by wetland vegetation. He stated ongoing concerns about the prevention of nutrient loading from that area. The soils are highly disturbed through subsidence and fertilization. He discussed phosphorus loading, wetland vegetation, peat soils, and evapotranspiration. Chairman Goerner stated that he is a proponent of sawgrass and reiterated his concern for isolation of the North Shore. He asked, with or without further remediation, if any of the areas of lesser contamination could be reconnected to Lake Apopka. Mr. Coveney stated that there are issues with pesticide residues and that duck hunting is not allowed on the North Shore because of contaminant levels in the ducks.

The distribution DDE on the NRSA was reviewed and shows a tendency for increase from the southwest to the northeast. SJRWMD analyzed 57 dead birds and found no issue with acute toxicity of DDE causing mortality. The effects of DDE are long-term hormonal changes that effect reproduction due to eggshell thinning. The thin eggshells easily break and the embryos die. Vice Chairman Johnson stated that research in the last decade has shown that eggshell thinning is related to lead and cadmium, more than it is organochlorines. Mr. Coveney verified that the age of the birds in the study was unknown but generally the older the birds, the higher the levels of the particular compounds. Metabolism is a factor and DDE is not well metabolized. The analyses of DDE, dieldrin, and toxaphene concentrations in bird brains and other lines of evidence helped SJRWMD to conclude that pesticide residues played a role, but were not the sole cause of the deaths. OCP toxicosis caused or contributed to the deaths of many of the birds, toxaphene and dieldrin were primary agents of toxicosis, and the primary route of exposure was soils to fish to birds. He reviewed bioaccumulation studies of soil, fish, and birds in laboratory microcosms, field

mesocosms, and a great egret feeding study. The Biota Sediment Accumulation Factor (BSAF) is one way to calculate the bioaccumulation of lipophilic (fat-loving) compounds in the environment. This was important and the main result of the microcosm study. Information derived-through the field mesocosm studies include first-order rate constants for evaluating attenuation and future projections, and a significant difference in pesticide accumulations in fish for deep water versus shallow emergent marsh restoration scenarios. The bird feeding study revealed long half-lives of OCPs in birds, constant ratios among organs of OCP concentrations in birds, evidence that OCPs were mobilized from fat to brain upon fasting, and that birds did not die, but may have sickened on 100% contained fish diet.

The SJRWMD study with great egrets was not a multi-generational study. The results of bioaccumulation studies show that BSAFs were 2 to 4 times higher in open water versus emergent marsh, OCPs move from fat to critical tissues when birds metabolize fat reserves, the half-life of weathered toxaphene in birds is longer than earlier believed, and OCPs degrade under flood conditions.

He explained Toxicity Reference Values (TRVs), and SJRWMD's risk assessment and remediation. SJRWMD determined that OCP were concentrated in the upper 12 inches of soil. They are tightly bound to organic matter and do not migrate into groundwater. SJRWMD tested and compared the results of inversion, blending, bio-remediation, excavation, and disposal for a possible remediation of 8,000 acres. Comparison of the remediation pilot projects revealed that inversion was the most efficient and cost-effective form of remediation. SJRWMD re-sampled sites for OCP and TOC and refined the remediation plan, accordingly. Soil inversion cost SJRWMD \$10,000,000 to treat 4,000 acres. Mr. Coveney discussed the steps (soil packer/roller, offset disc, mower, ripper/chisel plow, chopper, and Baker disc plow) in soil inversion. Chairman Goerner asked if the fish or birds at the remediated site are fit for human consumption. Mr. Coveney stated that fish sampling shows, after remediation, levels consistent with the emergent marsh/shallow flooding prediction. The levels are ecologically safe (not dangerous) to fish-eating birds, but that is not the same as safe for human consumption. Mr. Coveney indicated that he will provide Chairman Goerner with any available projections for when the remediated area will be ecologically safe for deeper flooding. All fish kills in the mesocosms were due to lack of oxygen. The fish accumulated levels of weathered toxaphene, that had it been fresh toxaphene, would have killed them. Mr. Coveney verified testing for arsenic and other toxic metals. The metal levels did not exceed any thresholds for ecological safety. The Council requested a hardcopy of Mr. Coveney's presentation and Mr. McLane agreed to send an article of interest from Vice Chairman Johnson to the Council. Mr. Coveney confirmed that solar radiation only effects degradation at the surface. Chairman Goerner asked if future reconnection of the Duda property, which is less contaminated, is a possibility. Mr. Coveney indicated he will provide the Council with the available information. Vice Chairman Johnson reiterated the need for a plan in case of future bird deaths and Mr. Coveney verified SJRWMD's plan.

7. COUNCIL AND AGENCY QUESTIONS AND ANSWERS

Mike Perry, Lake County Water Authority (LCWA), indicated that he had no information to report or update. Mr. McLane distributed a written copy of FDEP's update. Dennis Renfro, FWC, indicated that FWC is partnering with SJRWMD to obtain grants for the McDonald boat ramp located at the north end of Lake Apopka and that he will provide Vice Chairman Johnson with the estimated project costs. FWC plans to construct a new parking lot, boat ramp, and facilities in areas

of Emeraldal Marsh. FWC staff and volunteers installed several hundred mossback fish attractors. The fish attractors have GPS coordinates and locations are marked with buoys.

8. COUNCIL MEMBER COMMENTS

A. Comments

There were no comments from the Council members. Kraig McLane distributed presentation request forms and a summary of topics for 2014 and 2015. He reported that he is taking another position at SJRWMD and that SJRWMD is considering hiring a consultant to provide all administrative support to the Council. Chairman Goerner stated that he would prefer independent support for the Council's administrative duties.

Discussion of Next Scheduled Meeting:

Councilman Nicholson requested an update on the flocculent migration in Lakes Apopka and Griffin for comparison against the amount in prior years. Chairman Goerner recalled the Council's former recommendation regarding sumps and contract for sumps at the Beauclair Canal. Vice Chairman Johnson requested a presentation by Mark Hoyer or Dan Canfield of Lake Watch on SJRWMD's successes or failures given current phosphate data and secchi disc measurements.

9. ADJOURNMENT

The meeting adjourned at 12:02 p.m.