

**DRAFT**

**MINUTES OF THE MEETING  
of the  
HARRIS CHAIN OF LAKES RESTORATION COUNCIL  
September 4, 2015**

The regular meeting of the Harris Chain of Lakes Restoration Council (Council) was held at 9:08 a.m. on September 4, 2015 at the Lake County Board of County Commissioner Chambers, 315 West Main Street, Tavares, Florida.

**Members Present**

Skip Goerner, Chairman  
Don Nicholson  
Sid Grow  
Robert Johnson  
Keith Truenow, Secretary

**Members Absent**

Hugh (Dave) Davis II  
Dr. Ed Schlein  
Stephanie Bishop

John Stump, ex officio member

**1. CALL TO ORDER**

Chairman Goerner called the meeting to order at 9:08 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, Schlein, and Bishop were absent. Stephen Tonjes (DOT) of the Technical Advisory Group (TAG) was absent.

**4. APPROVAL OF MINUTES**

Discussion and approval of the April 3, 2015, May 1, 2015 and July 2015 minutes. Minutes approved.

**5. PUBLIC COMMENTS**

Mr. Larry Beasley, farmer, expressed his opinion dealing with a eutrophic lake (Apopka), an aging, dying lake, may recover but that it will be a long time process. Mr. Beasley noted people live around the lake, use the lake, and use water from the lake, and it was a variety of human impacts that negatively impacted the lake. Mr. Beasley discussed his farming operation water management system as a 2-part system in which ponds were used to store runoff before discharge to the lake. He speculated 90% of the water discharged back to the lake was cleaner than what was in the lake. His operation did not use much water directly from the lake, it was mostly from stored water. Chairman Goerner queried Mr. Beasley as to how much water was used for irrigation purposes. Mr. Beasley did not have any data at hand, but speculated the operation generally lost about 40% from evapotranspiration. Chairman Goerner further discussed acreages of crop production on the north shore and inquired about what was the entire surface area in farm production, and how much water overall was lost to evapotranspiration. Mr. Beasley commented all parties share what has happened to Lake Apopka, but the major culprit is Mother Nature, as it is an aging lake.

**6. PRESENTATIONS / ACTION ITEMS**

**A. Lake Apopka bird mortality incident from 1999—Heath Rauschenberger, PhD, Deputy Field Supervisor, USFWS**

Chairman Goerner introduced Heath Rauschenberger, PhD., Deputy Field Supervisor for the US Fish and Wildlife Service. Dr. Rauschenberger presented an overview of his background, noting that he started working on Lake Apopka in 2001, with previous experience conducting research throughout the Harris Chain of Lakes on the developmental ecology of alligators. Dr. Rauschenberger discussed the history and background of Lake Apopka, noting the lake was named from the Creek Indian word Ahapopka, meaning potato-eating place, or the Seminole Indian word Tsala Apopka, meaning trout(bass)-eating place. Lake Apopka lies within the highest point in peninsular Florida, the 95 meter Sugarloaf Mountain. Historically, approximately one third of the lake was composed of sawgrass marsh, and organic peat deposits of up to 6 meters thick were located along the northeastern shore. Dr. Rauschenberger noted Lake Apopka was famous for fishing and was a popular winter vacation destination.

Dr. Rauschenberger described the degradation of lake water quality over time as a cascade of events, which included the excavation of the Apopka-Beauclair canal, wastewater discharges, and expanded farming on the north shore through the 1980s. Dr. Rauschenberger also noted gizzard shad had an impact on water quality causing a continual recycle of nutrients. Dr. Rauschenberger presented a slide showing the changes in the lake from the 1930s to the 1980s. In the 1930s, the north shore was all marsh area, the lake was mesotrophic with clear water, aquatic plants and gamefish were abundant, and firm organic and mineral sediments were present. By the 1980s, the north shore was farmland, the lake was hypereutrophic with algal blooms, aquatic plants and gamefish were few, and flocculant nutrient-rich sediments were present. Dr. Rauschenberger presented the restoration program goals for Lake Apopka. The goals included restoring farmland to wetlands, reduction of phosphorus inputs, utilizing wetland filtration to remove phosphorus from lake water, gizzard shad removal to further remove and reduce phosphorus recycling, plant native species, fluctuate water levels to develop habitat, and prevent the expansion of *Hydrilla verticillata*. To accomplish these goals, SJRWMD purchased the north shore farms for \$100M, which included funding from the US Department of Agriculture Natural Resources Conservation Service (NRCS) Wetland Reserve Program. Several thousand hectares of the acquired land were left inundated in the fall of 1998.

During the winter of 1998/1999 a bird mortality event occurred in which 700 birds died, including 43 federally listed wood storks. This led to a USFWS investigation and the deflooding of the inundated areas. The regulatory issue was the NRCS and SJRWMD did not discuss the proposed plan with USFWS prior to flooding. All legal matters between SJRWMD and the Federal government were resolved via the Lake Apopka Agreement.

Dr. Rauschenberger presented the findings of USFWS investigations, identifying toxic levels of organochlorine pesticides (OCP) transferred from soils to fish to birds as the cause of the mortalities. The issues restoration managers had to address included how did lethal OCP levels accumulate in the birds, and how to move forward with restoration of wetlands with acceptable risk. The Council noted restoration efforts were prevented because of the supposed chemicals in north shore soils. Dr. Rauschenberger discussed the sources of the OCPs, the historic application rates for the major OCPs from the 1950s to the 1960s, and the ultimate ban on OCPs by 1987. Dr. Rauschenberger noted the USFWS conducted a series of studies on 64 bird brains collected from 1998-1999. Previous studies in 1960s by USFWS had shown the OCPs dieldrin and endrin were

known to cause death, and lethal levels of those chemicals were found in the brains. The Council mentioned several reports that disagreed with the USFWS conclusions, including an Audubon report. It was also noted there were no fish kills associated with the bird mortalities. Dr. Rauschenberger noted the USFWS toxicologist on the ground during the event reported body levels of OCPs in the fish that were so high they should not have been alive.

Dr. Rauschenberger continued his presentation, discussing a series of mesocosm feeding studies at the University of Florida using great egret as the fish-eating study animal. Researchers observed that some egrets fed tilapia food preparations with known concentrations OCPs would stop eating and show toxicosis. Other egrets continued to feed with no apparent ill effect. Researchers then studied forced fasting of egrets versus egrets that had free food choice. The working hypothesis was that egrets in the study that went off feed used glucose for brain support, which provided a transport mechanism for OCPs to concentrate in the brain. Looking backwards, Dr. Rauschenberger speculated that when the birds came into the flooded areas they all ate fish with lethal body concentrations of OCPs but that most of them suffered no ill effects because of a healthy body composition. Some of the birds however, were physiologically compromised (i.e. like fasting birds), allowing lethal levels of OCPs to move to the brain, causing mortality.

Chairman Goerner noted that when the mortalities took place, research on pelicans showed that they died all over the country. Councilman Johnson provided a report that showed high pelican deaths all around the country. Dr. Rauschenberger remarked that differences in what the birds were fed may have had an influence on whether toxins showed up in brain tissue. Dr. Rauschenberger noted a study on fish tissues in which OCP concentrations were so high that they should not have been alive. Chairman Goerner also noted there should have been studies of the fish in the flooded areas, and as a result it cost millions of dollars because of erroneous information and mitigation was conducted elsewhere (Matanzas Marsh) not locally.

Chairman Goerner remarked there were many gaps in the research because the US Environmental Protection Agency (EPA) was not allowed to perform tests. Councilman Johnson expressed concern about the possibility of another mortality event in the future. Dr. Rauschenberger reported that all dead birds (that fall under the ESA) are sent to a Federal lab for examination. Reports go to the USFWS special agent or US Attorney depending on the circumstances. According to Dr. Rauschenberger, full workups and reports were done with the Lake Apopka birds and that no disease was found.

Moving forward, Dr. Rauschenberger expressed confidence that the problem would not occur again. During the Lake Apopka event there was a disconnect between the Jacksonville USFWS office staff and administrators in Washington. There was also mention of raw effluent being discharged into the lake, as well as the discharges from the orange juice plant.

Dr. Rauschenberger showed a map depicting soil sampling locations in the north shore area in which there was only one hot spot for toxaphene, and the challenges of large scale OCP remediation was discussed. The remediation plan used fish as the trigger target, with restoration to take place acre by acre over time with intense monitoring. The soil remediation method chosen was to deep plow the soils to invert the soil and break the exposure pathway; a technique currently used in the Everglades. Mr. Stump reviewed the toxaphene levels slide and inquired why the levels were so low. Dr. Rauschenberger noted that cleanup levels for OCPs were set for humans not birds and that the driver for remediation was not toxaphene but DDE.

In 2013 the 15,000 acre marsh area was considered fully restored, with mixed-marsh management, and an operational flowway to the lake. Chairman Goerner noted the Harris Council is looking for full re-connection of the marsh to the lake, not just with the flowway. Chairman Goerner acknowledged there needed to be some restoration to compensate for subsidence but full reconnection was a goal of the Harris Council. The USFWS conclusions are that former farms have been reflooded safely for wetland restoration, a portion of the area will be managed for waterfowl, P loading reduction is working, and water quality improvements are underway despite recent hurricanes. In summary, 15 years after the event, Dr. Rauschenberger remarked that restoration is not without risk, it is important to follow regulations and procedures, restoration takes time and patience, avoid litigation if possible, use monitoring and research is key in managing risk and applying adaptive management, and it takes risk-tolerant and committed people to restore degraded ecosystems.

Chairman Goerner remarked that for the amount of money spent on the remediation there should have been a definitive explanation or conclusion for the bird mortality. Because of the event there is still no reconnection to the lake. The opinion of the Council is the EPA and farmers should have had access to the bird carcasses for extra study to determine whether the mortalities were due to OCPs or Newcastle disease.

Chairman Goerner noted during this period the Department of Health (DOH) was notified about the possibility of Newcastle disease but the USFWS would not cooperate with DOH, the entire area was cordoned off, and DOH was not provided the opportunity to investigate. Chairman Goerner reiterated despite the long period of time since the mortality event, questions remain, and that USFWS did not handle the investigation well. There is still a long way to go and much money has already been spent, before the lake can finally be reconnected.

Dr. Rolland Fulton addressed several points regarding pesticides issues brought up by Councilman Johnson. Dr. Fulton noted comparisons of LD50 estimates for OCPs are from single dose tests, whereas estimates from the Exponent report were derived from daily dose experiments. There are significant differences between doses over time versus a single dose. Councilman Johnson noted the biggest error in the USFWS investigation was not sacrificing some living birds for testing purposes. Dr. Fulton also noted the findings of SJRWMD were in agreement with USFWS. Councilman Johnson and Dr. Fulton agreed there were differences in the interpretation and opinions of the results of the Exponent report.

**B. Presentation on Lake Apopka historic and current lake levels –Rolland Fulton, PhD, SJRWMD**

Dr. Rolland Fulton, SJRWMD, made a presentation on historic and current lake water levels in Apopka. Dr. Fulton noted differing statements on early reports of where discharge occurs from Lake Apopka. A 1954 study reported that at extremely high stages, Lake Apopka overflowed northward through a swale connecting the lake with Lake Beauclair. Other reports between 1893 and 1915 reported lake levels varying 61.1 ft NAVD (North American Vertical Datum) to 67.8 NAVD. Dr. Fulton also noted some differences in lake names from a map Atlas of 1865. Dr. Fulton presented lake level data from 1936 to present, including data within the current regulation schedule that was implemented in the 1960s. Chairman Goerner observed that the past 20 yrs of water levels appear lower. Dr. Fulton noted there had been some severe droughts during that time, but also operations along the north shore may have lowered water levels. Dr. Fulton presented a

slide on long-term rainfall in which no long-term trend was discernible. The lowest rainfall occurred in 2000 when Apopka water levels were also at its lowest. A slide of aquifer levels during 1940 to present showed a major decrease in the 1960s that has not recovered in the decades after. A graph of two wells in the area also showed fluctuations consistent with rainfall. Springs discharge between Winter Garden and Lake Apopka shows similar trends with water level and spring discharge. Dr. Fulton noted changes in the late 1990s are consistent with the drop in rainfall. The current water levels are below average despite recent rainfall. One possibility suggested by Dr. Fulton is that severe drought may override the natural ability of the lake to maintain water level. Chairman Goerner noted there are droughts, north shore contributed to some extent. Modelers have previously discussed there are minimal losses to the lake. Chairman Goerner speculated the apparent contribution to the lake is bigger.

In July, water levels start to increase, and in the last week lake levels have gone way up. Other lakes had discharges that control levels. Chairman noted the lake level was above the minimal desirable elevation but not at regulation level. Mike Perry, Lake County Water Authority (LCWA) showed Apopka stage and Griffin stage, as well as several graphs of rainfall in the area. Although lake levels are still low, Apopka water levels have shown the highest increase over the time period. A slide of drainage areas shows that Apopka receives less runoff than others basins and both Chairman Goerner and Councilman Truenow discussed the importance of drainage area versus lake elevation.

**C. Annual Report Review-Denis Frazel, Harris Council Administrative Support**

Chairman Goerner requested the annual report review be postponed until the October meeting because of time constraints.

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

Mike Perry (LCWA) reported the Lake Magnolia boat ramp was clogged with tussocks and t plans to remove the vegetation in the next few weeks. Mr. Perry noted lake levels were up over the summer, and 200 cubic feet per second (cfs) of water was moving through Harris Chain. It is anticipated structures will be closed as rainfall lessens. Mr. Perry noted the Lake County final budget still included \$10,000 for the Harris Chain of Lakes.

Councilman Grow queried Chairman Goerner about funding of the wedge wire demonstration project proposed by Dr. Canfield. Chairman Goerner reported Dr. Canfield had received separate funding for the project.

Dennis Renfro, FWC, reported the Clean Flow aeration project has installed 99 air stones in the 250-acre Magnolia Park Site #2. Mr. Renfro reported a presentation could be put together on the project. Mr. Renfro also met with the Orange County team planning the Lake Apopka Feb 6, 2-16 Apopkapalooza event. Mr. Renfro also noted the project of breaching the levee on Area 3 was in the 2-yr process.

David Whiting, FDEP, reported on several upcoming workshops and meetings. Mr. Whiting also noted that in preparation for the presentation by Dr. Rauschenberger he noted the necropsy results of birds from the mortality event tested positive for titers of Newcastle Disease for 5 of 7 samples processed by FDEP. Most important though is that positive titer levels do show a given bird has the disease, just that they had been exposed. Chairman Goerner noted t the whole problem was that the sample collection and analyses during the event were not thoroughly vetted.

**8. COUNCIL MEMBER COMMENTS**

**A. Comments**

Councilman Nicholson requested that an expert on Newcastle Disease and Avian Flu, perhaps from the University of Florida, be scheduled as a speaker.

**B. Discussion of Next Scheduled Meeting**

**9. ADJOURNMENT**

The meeting adjourned at 12:21 p.m.