

DATE: June 13, 1968

TO: Florida Air and Water Pollution Commission

FROM: Florida Game and Fresh Water Fish Commission

SUBJECT: Water pollution and fish populations of the large lakes of the Ocklawaha drainage.

The large lakes at the headwaters of the Ocklawaha drainage, in order of connection with each other, and their approximate elevations above sea-level are: Lake Apopka, 67 feet; the Lakes Carlton, Beauclair and Dora complex, 62 feet; Lake Eustis, 62 feet; Lakes Harris and Little Lake Harris, 62 feet; and Lake Griffin (connected with Lake Eustis), 58 feet.

The City of Winter Garden is on the southeast shore of Lake Apopka, Mount Dora is on the east side of Lake Dora and Tavares is on its northwest side, Eustis is on the east shore of Lake Eustis, and the City of Leesburg is situated between the southwest shore of Lakes Harris and the southern end of Lake Griffin. The populations of all these cities have greatly increased during the past 20 years; roughly the time period of record for our fishery data.

All of these cities have been, and are still disposing their sewage wastes, following treatment, into the lakes on which they are situated. Large areas of mucklands adjoin Lakes Apopka, Dora and Griffin, and have been gradually converted into agricultural usage during the past 20 years. The muck farms also drain into the lakes. Citrus processing plants, at first undergoing no treatment, and now subject to various treatment methods, complete the list of the three major water pollution sources for this chain of lakes. Other than the citrus waste, no industrial pollution exists.

We define water pollution to mean "the specific impairment of water quality by agricultural, domestic or industrial wastes to a degree which has an adverse effect upon any beneficial use of water, yet which does not necessarily create an actual hazard to public health." This definition was adopted by the American Fisheries Society in 1966 (Special Publication No. 3).

Our fishery data begins in the year 1947, when the waters of all the lakes of the chain were clear, or slightly tannin-stained during times of high rainfall and run-off from wilderness and

swampy areas. Underwater, emergent and floating vegetation was profuse, particularly in Lake Apopka and Griffin. Water levels were consistently two to three feet higher than they are now held. Because the water control concept was in its infancy, levels were allowed to fluctuate naturally with seasonal rainfalls.

Sportfishing success was excellent. Thirteen fishing camps on Lake Apopka has an investment of more than a million dollars in real estate and boat liveries. In 1951, 199 boats were available for hire on Lake Apopka and were frequently all rented and out fishing. The average income for these camps and docks was conservatively estimated by our personnel to be \$40,000 per month. The total annual value of the sportfishery alone of Lake Apopka was set at more than one million dollars. The sportfishes supporting this industry were largemouth bass, black crappie, bluegill and shell-cracker. Limit catches were the rule, rather than the exception. The commercial fishery of Lake Apopka was equally good. Our figures indicate that the Lake Apopka commercial fishermen received more than a quarter of a million dollars per year, wholesale value, for catfishes from trotlines during the year 1951. Although we have no records in such detail for the Lakes Dora to Griffin chain, a comparable situation existed there also.

Fish sampling through use of the large haul seines graphically illustrated the population composition of the fish in the lakes of those days. In the year 1948 the combined percentage by weight of bass, crappie, bluegill and shellcracker in Lake Apopka was 56.4, garfishes: 15 and gizzard shad 5.7. In that same year the seine results showed 75.9 percent gamefish in Lake Beauclair; 75.9 in Lake Dora, 82.9 in Lake Eustis, 51.9 in Lake Harris, and 74.4 percent in Lake Griffin. Percentages of gizzard shad in these lakes then ranged from 1.5 to 24.6, and garfishes from 5.3 to 19.7 percent by weight of the total catch. In the 1952 - 1953 period of seining, Lakes Eustis and Harris showed a range of 62 to 64 percent by weight gamefishes, and 20 to 25 percent, gizzard shad.

By the year 1956 fishing conditions became extremely poor on Lake Apopka. Sport camp operators and other interests requested that the Game and Fresh Water Fish Commission study and relieve the situation. A large haul seine put in operation in Lake Apopka in 1956 showed the population of gizzard shad and garfishes to be 81.6 and 3.2 percent, respectively, and gamefishes 16.1 percent, by weight of the total catch. In the year 1966, the large haul seine showed a population of 2.2 percent gamefishes, 40.3 percent garfishes and 56.7 percent gizzard shad in Lake Apopka.

By the year 1967 the percentages of gamefishes caught in the seine in Lake Eustis and Harris were 5.2 and 10; respectively, and in the Lake Dora complex 5.9 percent. In Lake Griffin in 1966 gamefishes represented 11.7 percent of the weight of the seine catch.

Greenish algal discolorations, which had been first noted in the waters of Lake Apopka in 1949 (at seasonal intervals and in certain areas) had increased by 1956 to such a degree that they were present throughout the lake at all seasons of the year. Underwater vegetation had practically disappeared. This year, 1956, marked the all-time low water record for Lake Apopka: 64 MSL feet in August. By this time artificial control of water level had become a practical reality, but it was operated less in those days for water conservation than for water dissipation.

By the year 1960 fish kills had become a regular springtime occurrence. They were first noted in the area of the Winter Garden City dock, and consisted of gizzard and threadfin shad at first, and then young (1 - 2 inch) brown bullheads, in enormous numbers. These kills invariably followed discharges of sewage and/or citrus wastes which frequently poisoned the night air of Winter Garden with odors so inexpressibly foul they awakened inhabitants gasping for breath.

The first large fish kill of more generalized distribution in the lake was in May 1962. During the succeeding year (again in May): 1963, a kill of an estimated 3 million pounds of fish, chiefly gizzard shad, again occurred. This kill was associated with aerial applications of pesticide to the farm crops on the northern end of Lake Apopka as well as with effluent of wastes. In the years 1964, 1965, 1966 and 1967 dead and dying fishes continued to be found principally in the vicinity of the sewage and citrus waste outfalls, and at the northern end of Lake Apopka. Those observed dead and dying at the north side of the lake in recent years tend increasingly to be shellcracker, bluegill and largemouth bass.

The patterns in Lakes Griffin and Dora are similar to that of Lake Apopka. Dead fish in the vicinity of sewage and citrus waste outfalls and in farming areas, greatly increased algal discoloration, spread throughout the water, disappearance of submerged and floating vegetation, lowered water levels and extremely poor fishing success are typical phenomena of the pattern. The condition of Lake Eustis is similar to that of Lake Dora, that of Lake Harris shows somewhat less deterioration than Lake Eustis, but eventually — soon, if drastic steps are not taken — the desirable native fishery resources of the entire chain will be completely destroyed.

The economic and esthetic values of clean water to our lakes and streams are as great as they are incalculable. Our waters should be suitable for continued propagation of desirable native fish and wildlife as well as for human health.

Therefore, in the belief that our native aquatic resources can and must be saved, the Game and Fresh Water Fish Commission requests that the Air and Water Pollution Control Commission carefully consider the following recommendations as a basis for immediate preliminary action:

1. Inform the public that contrary to commonly held beliefs, even the best conventional sewage treatment plants in Florida continue to pollute her waters, that the cost of adequate waste treatment and disposal will be high, but that such costs will not be nearly as great as the value of the hydrological resources now being steadily destroyed, or the eventually necessary cost of replacing them.
2. Coordinate efforts of citizens, local governments and technical groups toward water pollution abatement through investigation of new developments in the field.
3. Provide guidance for municipalities and organizations through honest evaluation of existing facilities and dissemination of information to the public concerning the old methods and the new ones which show promise.