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ADDENDUM

Prepared By

ECOLOGY CONSULTANTS, INC.

For

COFFEEN POWER STATION

THERMAL DEMONSTRATION

On May 26, 1977 Central Illinois Public Service (CIPS) Company presented a Thermal Demonstration to the Illinois Pollution Control Board. The Thermal Demonstration indicated that CIPS intended to have further biological work done at Coffeen Lake as a fact-finding survey.

Ecology Consultants, Inc. performed the first phase of the fact finding survey in late April of 1977. Water temperature, dissolved oxygen profiles, phytoplankton, zooplankton, benthic macroinvertebrates and fish were sampled at four stations in Coffeen Lake. Station 1 was located in the discharge arm; Station 2 in the deep water near the dam; Station 3 between Station 2 and the largest arm southwest of the plant; and Station 4 upstream from the railway bridge.

The results of this fact finding survey may be summarized briefly. The water at Station 1 was homothermious at 17.1 C from surface to bottom. Weak thermal gradients were found at the other four stations. Oxygen reduction at depth greater than 1 meter was evident at all stations except Station 1. Only near the bottom at Station 3 did the recorded amount fall below 4ppm.

Conductivity, an indicator of amount of ionized substances in water, was approximately 1500 micromhos at Station 1, 1200 at Stations 2 and 3 and 1,000 at Station 4.

Fourteen taxon of green algae, 3 of blue-green algae, 36 diatoms, 1 dinoflagellate and 4 eugleuoids were identified. Total phytoplankton density ranged from 1,547 cells per ml at Station 4 to 9,759 at Station 3. The mean abundance of phytoplankton in April at Coffeen Lake (6,721 units/ml) was

similar to number reported for the spring - early summer period for Lake Sangchris (DNHS 1974 and 1975) and slightly greater than those reported from Newton Lake (ECI 1975, 1976 and 1977).

The USEPA (1975) reported 9,531 algae units/ml from samples taken in May 1973, 4,432 units in August samples and 789 in October.

April 1977 Coffeen phytoplankton was dominated by algae species which specially grow on substrawm surfaces rather than by planktonic species.

Zooplankton samples included 19 taxon of rotifers, 9 of cladocerans and 8 of copepods. Small species dominated the zooplanktons.

The mean number of benthic macroinvertebrates was 111 individual per square foot or 1,194 per square meter. This amount is similar to those reported for Lake Sangchris and Newton Lake.

Fish were collected between April 26 and May 1 by gillnets, unbaited hoop nets and seives. Gill and hoop nets were set approximately 24 hours per set. 14 taxon of fish were collected; total catch was 678 individuals. Most abundant fish in catches were gizzard shad (229), white crappie (213), channel catfish (89) and bluegill (80). Six large-mouth bass were captured, although anglers were making good catches by rod and reel.

Information available on fish in Coffeen Lake was reviewed and the April data added. It was concluded that Coffeen Lake is presently supporting a good fishery for large-mouth bass, white crappie and channel catfish.

Historically, fish in Coffeen Lake tend to exhibit poorer condition when small than when large, particularly for carnivorous species. Omnivorous and plankton feeders appear to show average growth.

Bluegills and small crappie appear stunted; this may be because of too many individuals for available forage. Largemouth bass and larger white crappie which can feed on gizzard shad appear to be growing well. Channel catfish are doing well in Coffeen Lake.

The final portion of the fact finding survey was accomplished July 24 to 26. This part of the survey was to search for young-of-the-year fishes as an indication of success of spawning in 1977. Seines of either 30 or 100 feet length, 6 foot depth, and 1/4 inch mesh were used. In general, seining was attempted along shores corresponding to the four sampling areas of the April survey. Seining in Coffeen Lake is hampered by steep, irregular and rough shore line and by vegetation. Unfortunately, the coves with most macrophyte cover for young fishes are difficult to seine and the catches are probably not representative of the true number of young fish. Because of unequal seining conditions, comparisons between stations are difficult to make. The most abundant species were gizzard shad and bluegill (Table 1), of species seemingly most important to anglers, 70 young largemouth bass and 1 catfish were captured. Young catfish frequently occupy deeper water and thus were out of range of seines. Young largemouth bass were seen in the vegetation in coves, areas very difficult to seine adequately.

All individuals captured appeared in good physical condition.

Although no definitive conclusions can be drawn concerning the population dynamics of the fish species in Coffeen Lake, successful reproduction is occurring in most game species and recruitment appears to be adequate to support existing populations. Also, the area upstream of the railway crossing and other areas outside the cooling loop appear to be critical to the Coffeen Lake fishery as spawning and nursery areas.

Table 1. Young-of-the-year fishes collected from Coffeen Reservoir, July 1977

Species	STATION 1	STATION 2	STATION 3	STATION 4
Clupeidae				
Dorosoma cepedianum	-	-	296	56
Ictaluridae				
Ictalurus natalis	-	-	1	-
I. punctatus	-	-	1	-
Centrarchidae				
Micropterus salmoides	-	-	14	56
Lepomis cyanellus	-	-	18	-
L. macrochirus	1	29	136	13
L. humilis	-	4	4	19
L. spp.	-	2	18	3
Pomoxis annularis	-	-	-	2