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MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

PARTIAL CHEMICAL RECLAMATION OF ELY LAKE, ALLEGAN COUNTY

David C. Johnson, District Fisheries Biologist

SUMMARY

Ely Lake, Allegan County, was partially reclaimed with rotenone in October 1972. Pro-Noxfish (2.5 percent rotenone) was sprayed over 95 percent of the shoreline from 0-2 feet deep at a concentration of 0.3 ppm to thin a large population of young-of-the-year bluegills.

Based on observations made following the treatment, it was estimated that about 80 to 85 percent of the young-of-the-year bluegill population was eliminated and very few other game species were affected. Success was attributed to the careful timing of the treatment. Observations made on Ely Lake indicated that the young-of-the-year bluegills only concentrated close to shore during sunny, calm periods.

The total cost of the project including chemical was \$150 or a per acre cost of \$8.35.

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INTRODUCTION

Ely Lake is an 18 acre state owned lake in the Allegan State Game Area in southwestern Michigan. The lake has a maximum depth of 14 feet. The surface methyl orange alkalinity and pH were 60 and 6.3 respectively. The lake has had a long history of stunted fish population problems, and has been chemicall reclaimed on at least three occasions, the most recent being September 21, 1970. On this date a complete reclamation was conducted using Pro-Noxfish in a concentration of 1.5 ppm. According to post treatment surveys a complete kill was apparently achieved.

Following reclamation, the lake was stocked with 15,505 hybrid sunfish and 2,000 largemouth bass fingerlings late in 1970. In 1971 and 1972 the lake was again stocked with largemouth bass. In 1971 it received various adult shiner minnows and crayfish. 15,000 surplus tiger musky fry were also stocked in 1972. The lake is scheduled for stocking of fingerling tiger muskies in 1973.

Several follow up surveys were conducted, the most recent being a fyke net survey on June 8, 1972. This survey yielded 75 hybrid sunfish averaging 6.3 inches; 57 bluegills averaging 6.7 inches; 35 largemouth bass averaging 10.2 inches; one smallmouth bass; one pumpkinseed; and three brown bullheads. A seining survey yielded five young-of-the-year bluegills and four adult shiners. According to the Hatchery Superintendent at the Wolf Lake Hatchery the hybrid stocking was contaminated and based upon the size of bluegills collected it would appear that these were the result of this contamination.

In September, 1972, an extremely large number of young-of-the-year bluegills were observed along the shoreline of Ely Lake during warm, calm weather. Other checks were made during cloudy, windy weather and very few young-of-the-year bluegills were observed. It was apparent that a very strong year class of bluegills had been produced during 1972 and if this year class was left unchecked it had the potential to create over-population within a few years. For this reason it was decided to attempt a partial reclamation to reduce the young-of-the-year bluegill population at a time when they were tightly concentrated along the shoreline.

METHODS

Due to its selectivity, Fintrol Concentrate would have been preferred for this treatment, but since none was available, Pro-Noxfish was chosen. It was imperative that the timing be right for this reclamation since observations clearly indicated that these young-of-the-year bluegills only concentrated on the shoreline during sunny, warm, calm weather. It was hoped that by treating only the immediate shoreline to a depth of approximately two feet a minimal number of desirable species (largemouth bass, hybrid sunfish and tiger muskies) would be killed.

On October 2, 1972, proper weather conditions were met so the partial reclamation was conducted. A concentration of 0.3 ppm of rotenone was sprayed over 95 percent of the shoreline. The 5 percent which was not treated was so shallow and weedy that it was impossible to operate the spray rig there. Young-of-the-year bluegills were distressed within one half hour of the spraying. Relatively few gamefish appeared to be in the area.

RESULTS AND OBSERVATIONS

On October 3, 1972, a sample of young-of-the-year bluegills and a complete collection of all other species was made along the entire treated shoreline. Several live young-of-the-year bluegills were observed in the untreated shoreline area, but very few live young-of-the-year bluegills were seen in the treated area. Table I indicates the estimated kill based on these collections.

TABLE I

Fish Removed by Partial Rotenone Treatment - Ely Lake, October 2-3, 1972.

<u>Species</u>	<u>Number</u>	<u>Weight</u>	<u>Estimated lbs. per acre removed</u>
Bluegills (YOY)	76,000	180 lbs.	10.0
Bluegills (I)	53	2 lbs. 6 oz.	.2
Mud Pickerel	89	7 lbs. 11 oz.	0.4
Largemouth Bass	96	7 lbs. 8 oz.	0.4
Green Sunfish	32	2 lbs. 1 oz.	.1
Bluegills (Adult)	1	6 oz.	--
Bluntnose, Mudminnow, Golden Shiner		---	--
Sand Shiner			

Observations made on October 3, 1972 indicated that approximately 90 to 95 percent of the young-of-the-year bluegills were eliminated. However, the shoreline was again checked on October 12, 1972, after the young-of-the-year bluegills had been able to redistribute and it was then estimated that approximately 80 to 85 percent of the total young-of-the-year bluegill population was eliminated, leaving approximately 750 survivors per acre. This number of young (750/acre) is a more acceptable level of recruitment for bluegills in Ely Lake.

COST OF MANAGEMENT

Including chemical, equipment, and labor, cost of the treatment and evaluation for this project was about \$150 (8.35 per acre). This cost compares very favorably with other management options.

DISCUSSION

It appears that partial reclamation using very low concentrations of Pro-Noxfish can be quite successful and economical in the reduction of young-of-the-year panfish if they are timed to coincide with proper weather conditions. It seems that these young-of-the-year fish only concentrate very close to shore during sunny, calm periods.

This successful reclamation was achieved with only 0.3 ppm of Pro-Noxfish and it could probably have been achieved with an even lower concentration. Due to poor timing of the release of chemical from the spray unit, 2/3 of the chemical was used on 40 percent of the shoreline and the remaining 1/3 of the chemical was used for the remaining 60 percent of the shoreline. Observations indicated no difference in the success of the treatment on the portion of the shoreline receiving the lower concentration of the chemical. Based on these results it would appear that such a treatment could be conducted using only about 0.2 ppm of Pro-Noxfish.

As Table I indicates the desired result was achieved without significantly affecting the desirable gamefish in Ely Lake. Relatively few largemouth bass were killed and no muskies or hybrid sunfish were seen. However, based on the mud pickerel killed in this treatment, it is surprising that no tiger muskies were affected.

Largemouth bass as small as 3.2 inches in length were found to be feeding on young-of-the-year bluegills as were the mud pickerel and green sunfish.