

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISHERIES

SUPPLEMENTAL SURVEY

County: LakeT 43N R 10E S 17, NE 1/4Directions: 0.25 miles NE ofLake ZurichDate of inspection: 5/21/97Water (Name) Echo Lake Owner Multiple

Address of Owner _____ Phone of owner _____

Lessee _____

Persons(s) contacted Richard Johnson Identification Lake Management CommitteeAddress of contact 23231 Hillcrest Dr., Lake Zurich 60047 Phone of contact 847/438-1920Water classification (check) State _____ Pub-Coop _____ Pub-Other _____ Organ XXX Commer _____ Stream _____1. Survey initiated by: Joe Ferencak2. Water size: 26.0 Acres or _____ Miles.3. Date of last inspection or work on water: 9/6/91 (Fish Removal/Rehab)4. Purpose of survey: Determine Post Rehab Development of Fish Population

5. Observations, comments, recommendations:

This survey was conducted to determine the status of the fishery following the total rehabilitation/restocking program completed in 1991 and 1992, and the algicide induced fish kill in 1993. During 30 minutes of electrofishing a total of 179 fish were collected comprising 5 species (Table 1). Thus, it is readily apparent that the '93 fish kill was not as extensive as initially reported by Bruce Muench, Lake Management Service. In terms of relative abundance, bluegill dominate the fishery as they comprised 65% of the sample, followed by largemouth bass (23%), carp (7%), black crappie (4%), and green sunfish (1%). Following the rehabilitation bluegill, channel catfish, and largemouth bass were stocked to reestablish a balanced sport fishery. Channel catfish were not collected or observed during this survey which indicates a very low or limited population, although this is not unusual as channel catfish generally have difficulty reproducing successfully in the presence of bass and bluegill, and as a result they must be supplementally stocked to maintain a fishable population. The maintenance of a channel catfish population in small lakes is considered desirable because they will prey on small bluegill, thus in conjunction with bass will help control the bluegill population, and they also diversify fishing opportunities. Carp, black crappie, and green sunfish have become established in the lake as a result of the 1993 flood conditions which facilitated movement within the watershed from Lake Zurich and/or were inadvertently or intentionally (illegally) introduced by anglers. The following is a brief summary of the results followed by recommendations.

Largemouth Bass: Bass density is very good as 42 fish were collected during 30 minutes of electrofishing or 1.4 fish/minute, which exceeds the 1.0 fish/minute value generally considered desirable from a management perspective. The bass collected ranged from 3.2 to 16.0 inches, with a mean length of 12.0 inches. Five year classes were represented in the sample, and while bass density is good, the population is dominated by five year old fish from the initial fingerling stocking in 1992, as they comprised 64% of the sample (Table 3 and Figure 1). This indicates that the bass population is experiencing poor reproduction and recruitment resulting from intense interspecific competition/predation by bluegill, which is compounded by excessive aquatic vegetation. Stock structure analysis reflects the disparity of small and intermediate size fish in the population as the proportional stock density (PSD) was 75; whereas 40 to 60 is considered the optimal range (Table 2). Growth rates and body condition, as expressed by relative weight (Wr), were average to good for all size groups (Figures 2 and 3). In an effort to improve bass reproduction and recruitment establish a 15 inch minimum length limit and 1 per day creel limit to maintain desirable densities of adult fish. In addition, the submergent aquatic vegetation in the lake, estimated

6. Biologist: Joe Ferencak Date of Report: 11/19/97

F.M. 5.0

(Largemouth Bass cont.) at 70% coverage, is excessive and is functioning to promote an overabundance of bluegill, which in turn are adversely impacting bass reproduction thru predation on the eggs and fry. As a result, the submergent vegetation, particularly around the shoreline area should be reduced to approximately 20 to 40% coverage.

Bluegill: Bluegill density is relatively high as 116 fish were collected ranging from 1.6 to 6.8 inches, with a mean length of 4.6 inches. Three year classes were represented in the sample, ages 1+ thru 3+, with 3+ fish dominating the population (Table 4 and Figure 4). Stock structure analysis indicates a disparity of larger fish to smaller fish as the PSD was 7, whereas, the optimum range is 20 to 40 (Table 2). This indicates that fish greater than 6 inches are experiencing poor survival, primarily as a result of angler directed harvest of larger fish. Bluegill are very prolific in that they can reproduce at a very high rate, while, as noted earlier, this situation is compounded by the presence of excessive vegetation which inhibits predation by bass and is essentially promoting an overabundance of bluegill in the 3 to 6 inch range. Therefore, the key to improving the overall balance and structure of the fishery relies primarily on reducing the vegetative cover. Growth and body condition (Wr) were average for all size groups represented in the sample (Figures 5 and 6).

Black Crappie: Crappie abundance is favorably low as only seven 2+ fish were collected ranging from 6.0 to 6.8 inches (Figure 7). This indicates that the fish were either recently introduced or are the offspring of adult fish which moved into the lake during the '93 flood event. In any case, the introduction of crappie into small lakes is generally not recommended because it usually results in a poor fishery. Similar to bluegill, crappie maintain very high reproductive potential and can easily overpopulate a small lake, and can also adversely impact the development of the bass fishery. Therefore, all crappie caught should not be returned to the lake regardless of size.

Carp: Unfortunately, carp were presumably afforded the opportunity to recolonize the lake within only two years of the '91 rehab. Fortunately, at the present time they are not very abundant as only 13 fish were collected ranging from 17.2 to 22.4 inches, and the fact that there is no evidence of any recent reproduction or recruitment based on the absence of small and intermediate size fish in the sample indicates that their density thus far appears to be adequately controlled by bass and bluegill. Nevertheless, the fact that carp are reestablished in the lake makes it even more imperative to improve and maintain a strong bass fishery.

Aquatic Vegetation: As noted earlier, submergent vegetation, consisting predominantly of curlyleaf pondweed, was estimated at 70% total lake coverage and almost 100% shoreline coverage. In general, submergent vegetation which exceeds 20 to 40% total coverage and/or 50% shoreline coverage is considered excessive from a fisheries management perspective as it can be detrimental to maintenance of a balanced fishery, as well as, other recreational activities such as boating and swimming. Therefore, a comprehensive aquatic vegetation control program should be initiated to reduce and maintain coverage at desirable levels. This can be accomplished thru the introduction of triploid grass carp and herbicide applications.

Water Chemistry Characteristics:

Air Temp.	Water Temp.	pH	Alkalinity	Total Dissolved Solids	Conductivity	Seechi	Water Level
53°F	58°F	9.1	171 ppm	620 ppm	870 μ mhos	2.9 ft.	0.0 ft.

Recommendations (in priority order):

1. Maintain aeration system operation to minimize or prevent winterkill and facilitate an improvement in water quality.
2. Initiate a comprehensive aquatic vegetation control program directed at reducing curlyleaf pondweed coverage (see enclosed booklet).
3. Establish a 15 inch minimum length limit and 1 per day catch limit on largemouth bass.
4. Stock 650, 8 inch, channel catfish biennially (see enclosed Private Fish Dealers listing).
5. Remove all crappie and carp caught from the lake.

TABLE 1. ECHO LAKE SPECIES CATCH SUMMARY, 5/21/97.

SPECIES	NUMBER	PERCENT	MINIMUM	LENGTH	
				AVERAGE	MAXIMUM
LARGEMOUTH BASS	42	23.5	3.2	12.2	16.0
SMALLMOUTH BASS		0.0			
BLUEGILL	116	64.8	1.6	4.6	6.8
PUMPKINSEED SUNFISH		0.0			
ORANGESPOT SUNFISH		0.0			
GREEN SUNFISH	1	0.6		5.6	
LONGEAR SUNFISH		0.0			
REDEAR SUNFISH		0.0			
SUNFISH HYBRID		0.0			
WARMOUTH		0.0			
ROCK BASS		0.0			
BLACK CRAPPIE	7	3.9	6.0	6.3	6.8
WHITE CRAPPIE		0.0			
YELLOW BASS		0.0			
WHITE BASS		0.0			
WHITE PERCH		0.0			
WALLEYE		0.0			
YELLOW PERCH		0.0			
LOGPERCH		0.0			
JOHNNY DARTER		0.0			
IOWA DARTER*		0.0			
MUSKELLUNGE		0.0			
TIGER MUSKIE		0.0			
NORTHERN PIKE		0.0			
GRASS PICKERAL		0.0			
CHANNEL CATFISH		0.0			
FLATHEAD CATFISH		0.0			
BLACK BULLHEAD		0.0			
BROWN BULLHEAD		0.0			
YELLOW BULLHEAD		0.0			
BOWFIN		0.0			
LONGNOSE GAR		0.0			
FRESHWATER DRUM		0.0			
CARP	13	7.3	17.2	19.6	22.4
GRASS CARP		0.0			
GOLDFISH		0.0			
GOLDEN SHINER		0.0			
COMMON SHINER		0.0			
EMERALD SHINER		0.0			
SPOTFIN SHINER		0.0			
SPOTTAIL SHINER		0.0			
BIGEYE SHINER		0.0			
BLACKCHIN SHINER*		0.0			
BLACKNOSE SHINER*		0.0			
FATHEAD MINNOW		0.0			
BULLHEAD MINNOW		0.0			
BLUNTNOST MINNOW		0.0			
BROOK SILVERSIDE		0.0			
BANDED KILLIFISH*		0.0			
CENTRAL MUDMINNOW		0.0			
QUILLBACK CARPSUCKER		0.0			
WHITE SUCKER		0.0			
SPOTTED SUCKER		0.0			
SHORTHEAD REDHORSE		0.0			
LAKE CHUBSUCKER		0.0			
GIZZARD SHAD		0.0			
ALEWIFE		0.0			
SPECIES= 5	TOTAL= 179	100.0			

*ENDANGERED OR THREATENED SPECIES.