



Summary of Fishery Surveys Stone Lake, Price County, 2009

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in 2009 to assess the status of important fish populations in Stone Lake. Our time, budget, and staffing available that year allowed us to add early spring fyke netting to complement our planned electrofishing survey. Fyke nets deployed shortly after the spring thaw targeted northern pike, walleye, muskellunge, and yellow perch and advanced our understanding of black crappies in the absence of fall netting effort specifically directed toward them. A late-spring electrofishing survey documented the abundance and size structure of largemouth bass and bluegill populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is based on known angler behavior.

Survey Effort

On April 30–May 1, 2009 we set three fyke nets at locations chosen to intercept early-spring spawning species and fished them overnight for one night (3 net-nights) when water temperature was 50–51°F. With water temperatures ranging from 57.5 to 59.5°F our nighttime electrofishing survey on May 18, 2009 should have coincided with the earliest spawning activities of largemouth bass and bluegills—males establishing their territories and building their nests. Bypassing only the shallow, densely-vegetated areas on the extreme north and south ends, we sampled nearly the entire shoreline, covering 2.08 miles in 1.03 hours, including 1.04 mile sub-sampled for all species in 0.50 hour.

Habitat Characteristics

Located about 6½ miles northeast of the Village of Rib Lake, 79-acre Stone Lake is a soft water lake with maximum depth 16 feet, average depth 8 feet, and 20% of its surface area less than 3 feet deep. Unnamed inlet and outlet streams, narrowly separated on the north end of Stone Lake, drain from Hultman Lake and to the channel connecting Spirit and North Spirit lakes. Most (80%) of the shoreline is upland forest on steep slopes with the remainder bog (15%) and marsh (5%) wetlands. Lakebed materials were 70% gravel and 30% muck near shore. Submerged woody structure was plentiful along the west shore. Average Secchi depth ranged 1.5 – 3 feet in July and August 1999 – 2001. Pea-green colored water, apparent in 2013 air photos, indicates high levels of nutrients that result in severe algae mid-summer algae blooms. With its high rate of biological productivity Stone Lake occasionally experiences partial winterkill—mortality of fish and other aquatic life that occurs when decomposing organic material depletes dissolved oxygen in an ice- and snow-covered lake faster than it can be replenished by atmospheric diffusion and photosynthesis. Because the inlet and outlet are close,

oxygenated water that enters Stone Lake when its tributary is ice-free in winter will flow out quickly without circulating through the main volume of the basin. The most recent winterkill was documented on April 2, 2013 when hundreds of bluegills and dozens of black crappies and largemouth bass were photographed gulping air at the surface in a room-size area of open water near a groundwater seep adjacent to shore. Shortly after the ice melted completely, landowners reported dead fish in substantial numbers along the windswept shores.

The Town of Spirit maintains a park and boat landing on the west shore and enforces an ordinance limiting boats to slow-no-wake speed from 2:00 p.m. to 11:00 a.m.

Summary of Results

We captured 12 fish species in our spring 2009 surveys, and University of Wisconsin staff collected specimens from five additional species caught by fyke netting and electrofishing on June 1 – 8, 2001. Largemouth bass and northern pike held codominance in the fish community, yet even together they were incapable of controlling panfish abundance and maintaining the predator-prey balance necessary for good bluegill and black crappie fishing. Golden shiners, yellow perch, white suckers, and yellow bullheads—all noted in moderate abundance and all preferred over bluegills and crappies as food by both bass and pike—may explain why predatory pressure is diverted away from the panfish populations that need it most.

Muskellunge



Spring 2009 fyke nets captured one 33-inch muskellunge. The only other survey records we found for Stone Lake muskies were two fish captured by early spring 1970 netting and mid-summer 1970 electrofishing and one 45- to 48-inch fish seen while electrofishing in April 1977. Since we have no record of muskellunge stocked into Stone Lake, we presume individuals occasionally emigrate from the Spirit Lakes population—the connecting stream has no permanent barriers to fish movement. Predation by age-0 northern pike may suppress musky recruitment in Stone Lake to prevent a musky population from becoming established there.

Walleye



Though walleyes were never noted in earlier surveys, we captured one adult female 26.3 inches long in our early spring fyke nets. A single, pre-survey walleye stocking record shows that 86,220 fish were planted in 1934, presumably as fry. It is unlikely that the walleye we found was a descendant of those fish stocked 75 years earlier. Instead, walleyes in Stone Lake are more likely transient individuals. Even with plenty of gravel substrate to serve as ideal walleye spawning habitat, Stone Lake's fish

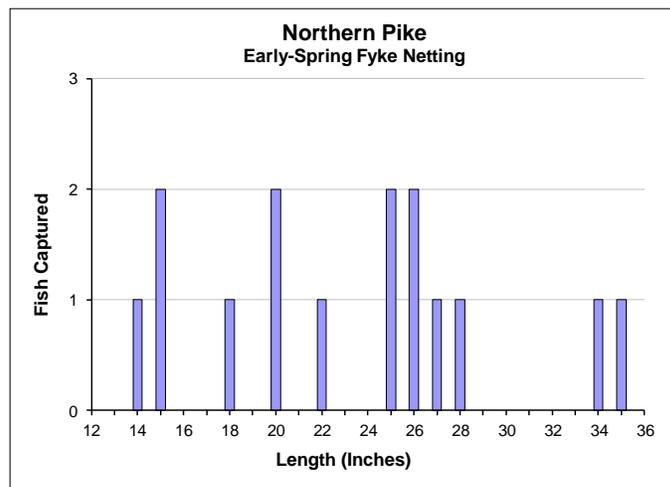
community composition will probably continue to preclude a walleye population sustained by natural recruitment. More recently, a total of 2,154 large walleye fingerlings, fed and grown to 6 – 8 inches long under a Cooperative Fish Rearing Agreement between the Rib Lake Area Fish & Game Association and the Wisconsin DNR, were stocked into Stone Lake in 2012 – 2015 to offer bonus angling opportunity and to help control panfish abundance by predation.

Northern Pike



Early Spring Fyke Nets

Captured 5.0 per net-night $\geq 14"$	
Quality Size $\geq 21"$	60%
Preferred Size $\geq 28"$	20%
Memorable Size $\geq 34"$	13%



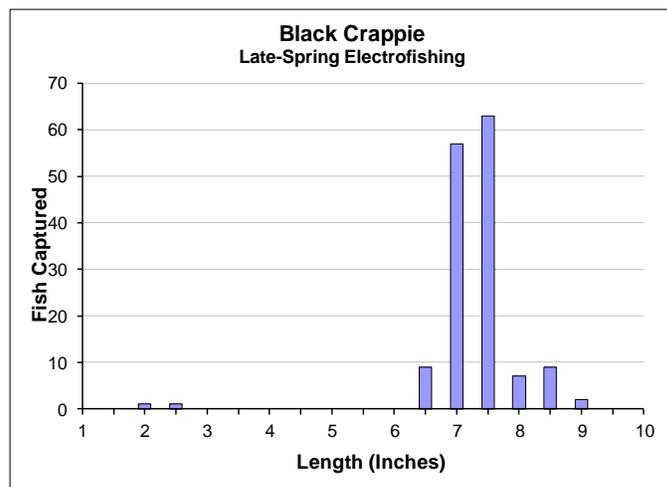
The capture rate of northern pike in early spring fyke nets indicates the low to moderate population abundance that is necessary to avoid intense food competition, maintain satisfactory growth (presumed), and produce favorable shares of preferred- and memorable-size fish. Our sample included pike in many size- and age-classes, suggesting that natural reproduction reliably produces a cohort in most years. Based on the wide range of sizes, we suspect that adult and juvenile pike move into tributaries to seek refuge before dissolved oxygen decreases to lethal concentrations in the lake basin.

Black Crappie



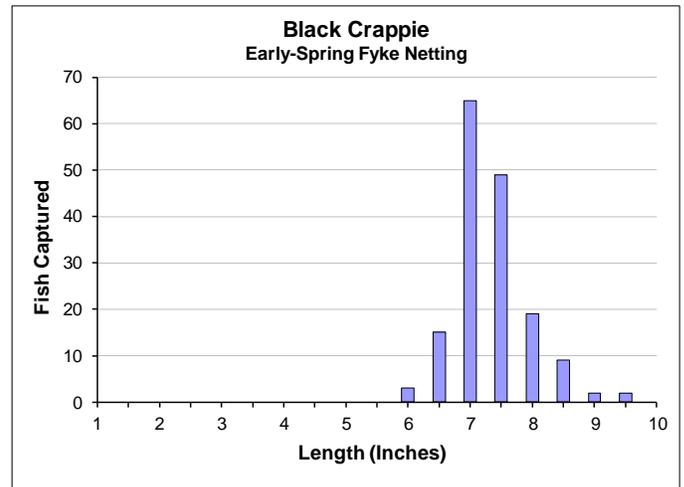
Late Spring Electrofishing

Captured 141 per mile or 294 per hour $\geq 5"$	
Quality Size $\geq 8"$	12%
Preferred Size $\geq 10"$	0%
Memorable Size $\geq 12"$	0%



Early Spring Fyke Nets

Captured 55 per net-night $\geq 5"$	
Quality Size $\geq 8"$	20%
Preferred Size $\geq 10"$	0%
Memorable Size $\geq 12"$	0%



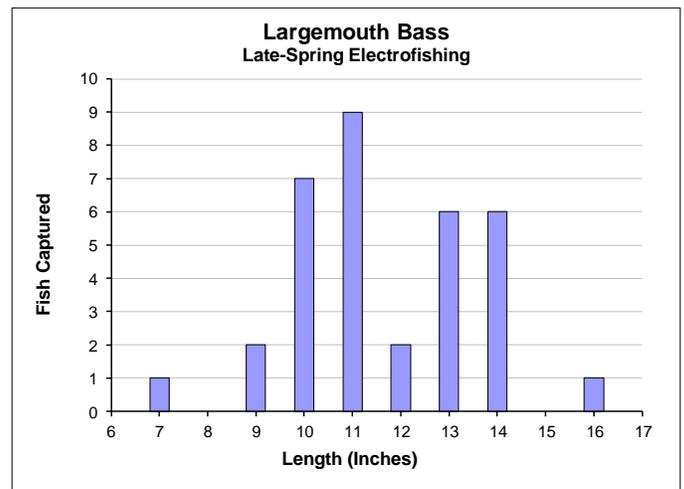
We captured black crappies by early spring fyke netting and late spring electrofishing at rates that indicate high abundance—the probable cause for the population’s slower-than-average growth rate and absence of any preferred-size fish 10 inches and longer. Ages estimated by scales taken from eleven crappies 7.5 – 8.5 inches long revealed that 91% of our aged subsample were age-4 survivors from the 2005 year class that had grown to 7.9 inches long on average. In northern Wisconsin black crappies typically reach 8.3 inches in 4 years. If our subsample had included fish < 7.5 inches, we probably would have detected a greater growth deficit in Stone Lake crappies compared to the regional average at age 4. Added predatory pressure from walleyes stocked annually as large fingerlings may eventually help to curb crappie abundance, reduce crowding and competition among crappies, and improve growth rate and size structure in the crappie population.

Largemouth Bass



Late Spring Electrofishing

Captured 16 per mile or 32 per hour $\geq 8"$	
Quality Size $\geq 12"$	45%
Legal Size $\geq 14"$	21%
Preferred Size $\geq 15"$	3%



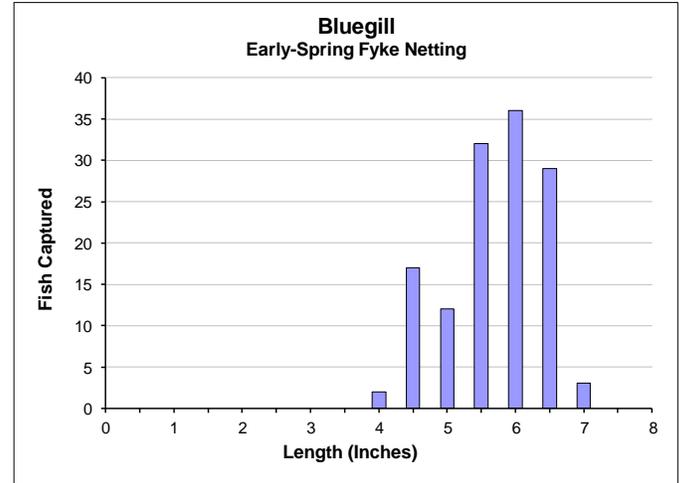
Our modest electrofishing capture rate points toward largemouth bass in low to moderate population abundance that allows individuals to grow at the regional average rate. Scales taken from all bass captured by electrofishing revealed that largemouth bass in Stone Lake attained 11.0 inches in 4 years (range 10.2 – 11.6; $n = 12$) and 12.7 inches in 5 years (range 11.3 – 14.4; $n = 10$), identically matching the regional average length at those ages. With satisfactory growth and presumed low angling harvest we suspect that Stone Lake’s bass population has a greater proportion of preferred-size fish than our sample shows. While electrofishing we saw but did not capture 10 additional largemouth bass closely associated with the abundant woody structure near shore.

Bluegill



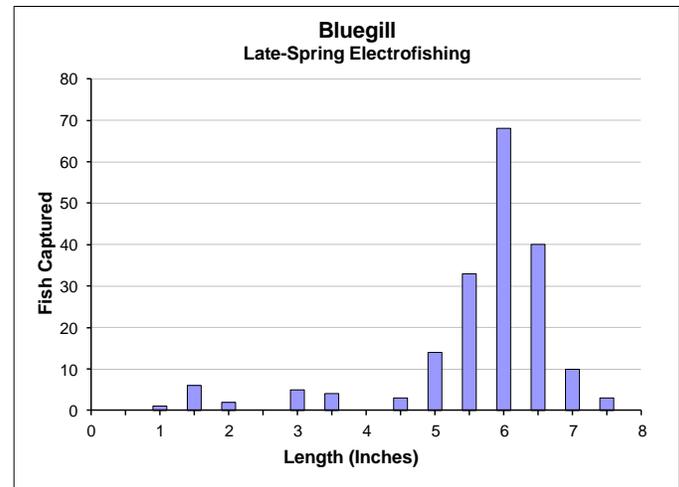
Early Spring Fyke Nets

Captured 44 per net-night ≥ 3 "	
Quality Size ≥ 6 "	52%
Keeper Size ≥ 7 "	2%
Preferred Size ≥ 8 "	0%



Late Spring Electrofishing

Captured 173 per mile or 360 per hour ≥ 3 "	
Quality Size ≥ 6 "	67%
Keeper Size ≥ 7 "	7%
Preferred Size ≥ 8 "	0%



Our netting and electrofishing samples represented a bluegill population in high abundance with low proportions of the keeper- and preferred-size fish that anglers want. The larger bluegills, which are sometimes undetected by spring electrofishing but well-represented in early spring fyke nets, were absent in both surveys. Ages estimated from scales taken from eleven bluegills 5.5 – 6.5 inches showed growth to 6.0 inches in 4 years (range 5.6 – 6.2; $n = 6$), but only to 5.9 inches in 5 years (5.5 – 6.4; $n = 4$). Average length of Stone Lake bluegills was 0.4 inches higher and 0.5 inches lower than the regional average at ages 4 and 5. This seemingly unusual growth pattern may have been explainable if our sample and analysis were stratified, rather than pooled from both sexes and all reproductive strategies combined. If occasional winterkill and added predation from stocked walleyes can cause more bluegills to die of natural causes, then perhaps crowding and competition among bluegills will subside to increase the population's growth rate and improve its size structure.

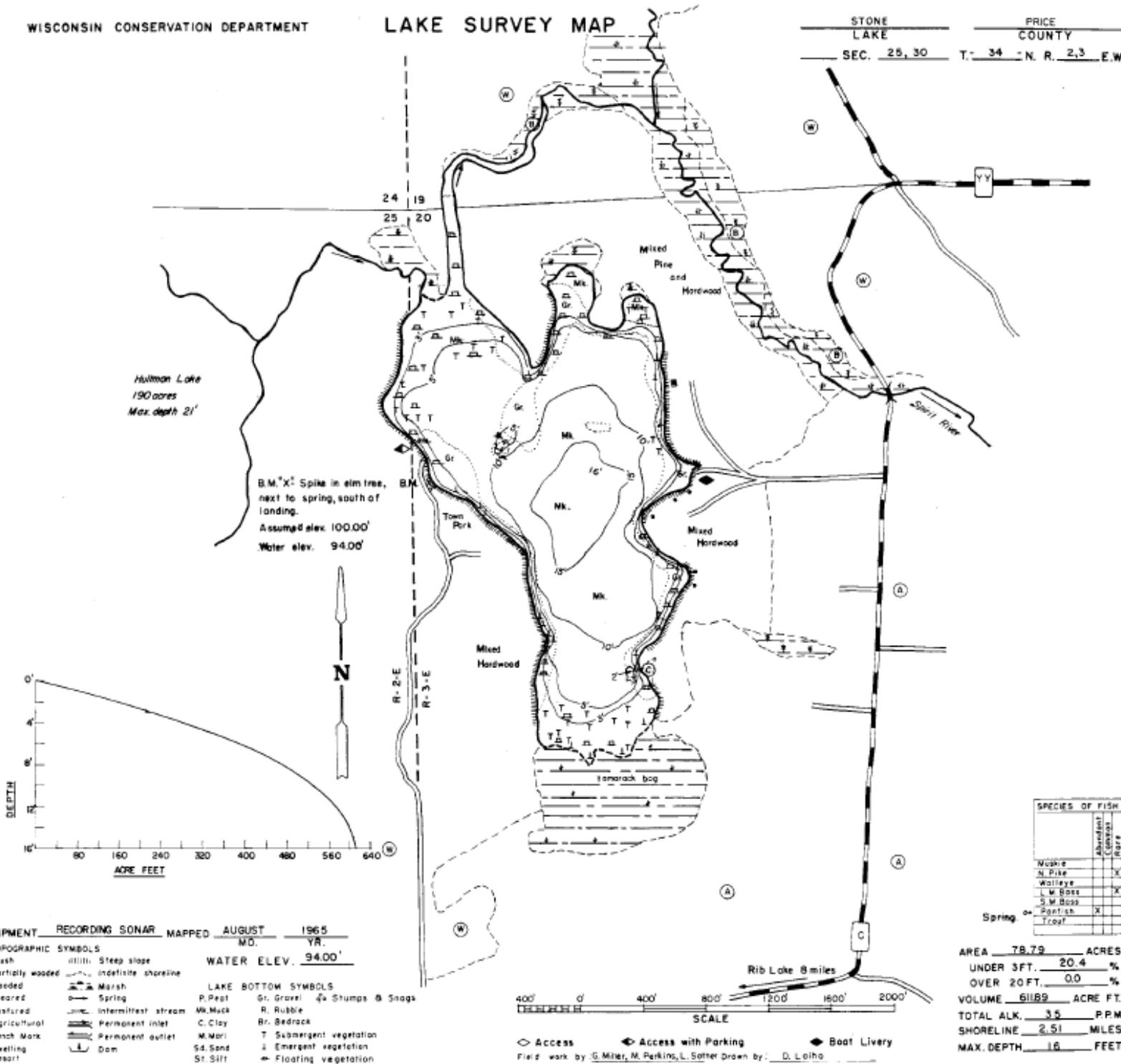
Survey data collected and analyzed by: Gavin King, Kendal Liezeit, Greg Rublee, and Jeff Scheirer—WDNR Fishery Team, Park Falls.

Written by: Jeff Scheirer—Fishery Biologist, January 22, 2016.

Reviewed and approved for web posting by: Mike Vogelsang—Northern Administrative District Supervisor, February 3, 2016.

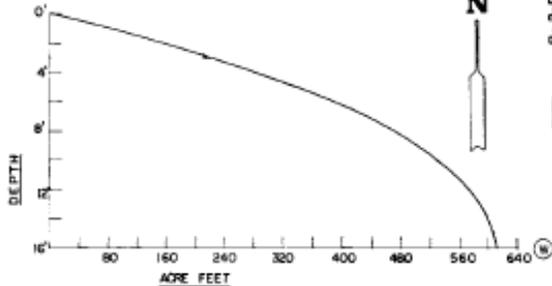
LAKE SURVEY MAP

STONE LAKE PRICE COUNTY
 SEC. 25, 30 T. 34 N. R. 2, 3 E.W.



Hultman Lake
 190 acres
 Max. depth 21'

B.M. X Spike in elm tree,
 next to spring, south of
 landing.
 Assumed elev. 100.00'
 Water elev. 94.00'



EQUIPMENT RECORDING SONAR MAPPED AUGUST 1965
 M.D. YR.

- TOPOGRAPHIC SYMBOLS
- (B) Brush
 - (PW) Partially wooded
 - (W) Weeded
 - (C) Cleared
 - (P) Pastured
 - (A) Agricultural
 - B.M. Bench Mark
 - Dwelling
 - Resort
- LAKE BOTTOM SYMBOLS
- P. Peat
 - Mk. Muck
 - C. Clay
 - M. Marl
 - Sd. Sand
 - St. Silt
 - Gr. Gravel
 - R. Rubble
 - Br. Bedrock
 - T. Submergent vegetation
 - E. Emergent vegetation
 - F. Floating vegetation
 - Stumps & Snags

400' 0' 400' 800' 1200' 1600' 2000'
 SCALE

◇ Access ◀ Access with Parking ◆ Boat Livery
 Field work by G. Miller, M. Perkins, L. Sotter Drawn by D. Lohio

SPECIES OF FISH	
	Abundant Scarcely Rare
Muskie	X
N. Pike	X
Walleye	X
L. M. Bass	X
S. M. Bass	X
Perch	X
Trout	

AREA 78.79 ACRES
 UNDER 3 FT. 20.4 %
 OVER 20 FT. 0.0 %
 VOLUME 61189 ACRE FT.
 TOTAL ALK. 3.5 P.P.M.
 SHORELINE 2.51 MILES
 MAX. DEPTH 16 FEET