Summary of Fishery Surveys
Crane and Chase Lake, Price County, 2011 – 2012

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in fall 2011 and spring 2012 to assess the relative abundance and size structure of important fish populations in 86-acre Crane and Chase Lake located about 6 miles northwest of Phillips, WI. We set 3 fyke nets and fished them overnight on October 10 – 12, 2011 for 6 net-nights of effort directed toward black crappie. Fyke netting shortly after the spring thaw at water temperatures 48 – 52°F targeted spawning northern pike, walleye, yellow perch, and muskellunge. Three nets fished overnight on April 2 – 6, 2012 resulted in 12 net-nights of fishing effort. With water temperature at 63°F our nighttime electrofishing survey on May 17, 2012 was well-timed to document the status of largemouth bass and bluegill populations during their spawning activities. We sampled the entire shoreline (1.53 miles) in 1.02 hours, including 0.59 mile sub-sampled for panfish in 0.45 hour. 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.

Habitat Characteristics

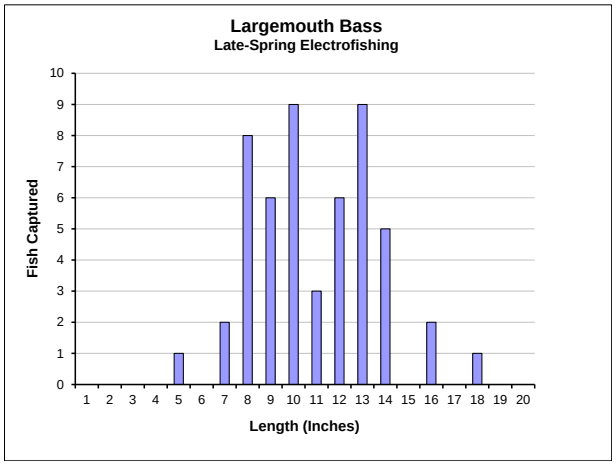
Crane and Chase Lake is the source of Crane and Chase Creek, which flows unobstructed 3.2 miles to Lac Sault Dore, a 561-acre impoundment on the Elk River locally known as Soo Lake. Maximum and average depths are 22 and 13 feet, and 5% of the surface area is less than 3 feet deep. The water is slightly acidic (pH = 6.4), and Secchi disk depth of 6 feet indicates moderately high water clarity. Bottom material is predominantly muck adjacent to the spruce-tamarack bogs that surround 65% of the lake perimeter. Gravel and rubble substrate flank the upland remainder where vegetative cover is mixed hardwood forest, cropland, and pasture. Residential development is light. Elk Township maintains a boat access and pavilion on the west shore, and a local ordinance limits motorboats to slow-no-wake speed during specified morning and evening hours.

Summary of Results

The twelve species captured by netting and electrofishing were typical of infertile, northern waters where largemouth bass and bluegill are the principal predator and prey. Populations of yellow bullhead, black crappie, pumpkinseed, yellow perch, golden shiner, and white sucker serve as alternative food sources. Northern pike, walleye, and muskellunge, all in low abundance, play a minor role in structuring the fish community.

Largemouth Bass

Captured 32 per mile or 48 per hour ≥ 8"	
Quality Size ≥ 12"	47%
Preferred Size ≥ 15"	6%

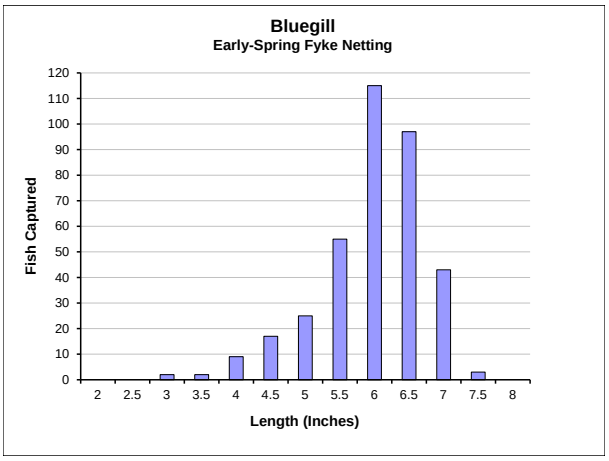


Our electrofishing capture rate of largemouth bass ≥ 8 inches long, coupled with our observations of bass that eluded capture, point toward moderately high population abundance that should provide fast fishing action. An avid bass angler, who diligently records his catch and fishing effort, caught 38 largemouth bass ≥ 8 inches in 5½ hours in two summer 2012 trips. Fifteen percent of all largemouth bass captured by electrofishing and 23% captured by angling were harvestable under the 14-inch minimum length limit. Assuming that harvest is negligible, age and increment analysis using scales suggests that a large portion of the slow-growing largemouth bass population dies of natural causes before the oldest individuals can attain the size that anglers prefer. Largemouth bass in Crane and Chase Lake grew to 9¼ inches long in 5 years (range 8.7 – 9.8; n = 8) and 11.7 inches in 7 years (range 10.7 – 12.7; n = 12) —3.8 and 4.5 inches below the regional average length at those ages. Largemouth bass 8.1 – 12.7 inches long at capture had gained on average 1.4 inches (range 0.7 – 2.55; n = 32) in their most recent growing season. Promoting selective harvest of largemouth bass 9 – 12 inches long under liberalized angling regulations could serve to reduce bass number and improve size structure, but low productivity apparent in the lake ecosystem may limit growth potential.

Bluegill

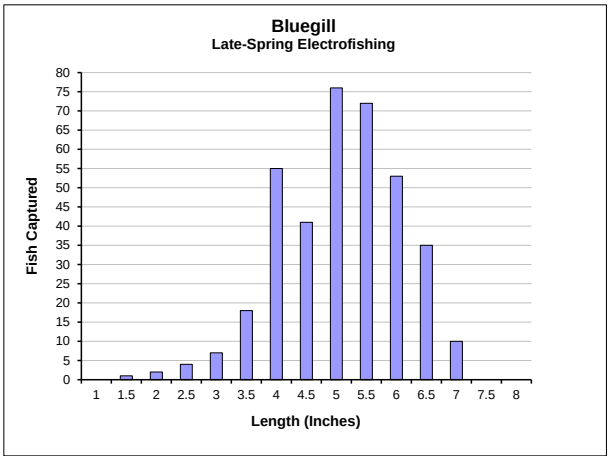
Early-Spring Fyke Netting

Captured 31 per net-night ≥ 3"	
Quality Size ≥ 6"	70%
Keeper Size ≥ 7"	13%



Late-Spring Electrofishing

Captured 622 per mile or 816 per hour ≥ 3"	
Quality Size ≥ 6"	27%
Keeper Size ≥ 7"	3%



An extremely high capture rate of bluegill ≥ 3 inches and the absence of bluegill longer than 7½ inches in our late spring electrofishing survey together reveal a slow-growing bluegill population at very high to excessive levels of abundance. Early spring fyke nets captured higher proportions of quality- and keeper-size bluegill, but none of preferred size. Northern bluegill populations suffer slow growth when dominant largemouth bass fail to eat enough young bluegill to control bluegill abundance. Abundant bluegill compete among themselves for food in short supply, grow slowly, and often die of old age before attaining the sizes anglers prefer. Young walleye are generally more effective than largemouth bass in controlling bluegill abundance by predation, but the six adult walleye ≥ 20 inches captured in spring and fall fyke nets indicate that walleye in Crane and Chase Lake are too scarce and perhaps too old to fulfill this vital role in maintaining a satisfactory bluegill fishery.

Effective options to improve bluegill size structure seem limited. Neither liberalized nor more restrictive harvest regulations would effect a change in bluegill length distribution if angling pressure remains as low as we suspect. Efforts to increase predatory pressure on bluegill by stocking expensive large walleye fingerlings in sufficient number and frequency to substantially reduce bluegill abundance would require continual investment because heavy predation by abundant largemouth bass would likely prevent walleye from becoming established as a population sustained through in-lake reproduction. If largemouth bass density increases further, bass may exert better control over bluegill abundance, but any related improvement in bluegill size will likely result in fewer bass ≥ 15 inches long. In the meantime youthful anglers can enjoy fast fishing action and with plenty of food walleye should grow faster than the average rate.

Walleye

Captured 0.3 per net-night ≥ 10"	
Quality Size ≥ 15"	100%
Preferred Size ≥ 20"	100%
Memorable Size ≥ 25"	75%

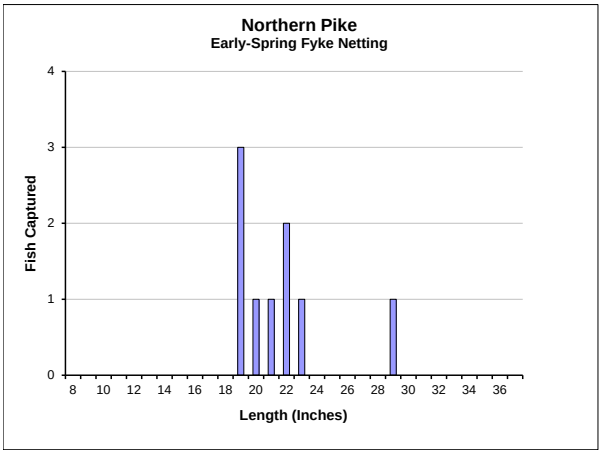
Muskellunge

Captured 0.2 per net-night ≥ 20"	
Quality Size ≥ 30"	100%
Preferred Size ≥ 38"	100%
Memorable Size ≥ 42"	100%

Capture rates in early spring fyke nets suggest that walleye and muskellunge are present in very low abundance, prompting us to question whether Crane and Chase Lake supports viable populations, or alternatively whether our surveys intercepted occasional emigrants from Soo Lake and Elk River where both species are common. Though muskellunge may persist at low population density as descendants of 700 fingerlings stocked from 1972 to 1973, we have no record of authorized walleye stocking in Crane and Chase Lake. The absence of young, intermediate-size walleye and muskellunge indicates that their reproductive survival is low or nonexistent—a familiar condition that may preclude coexisting populations when dominant largemouth bass control recruitment by predation. Anglers should not expect more than a rare opportunity to catch a large muskellunge or walleye while fishing for largemouth bass.

Northern Pike

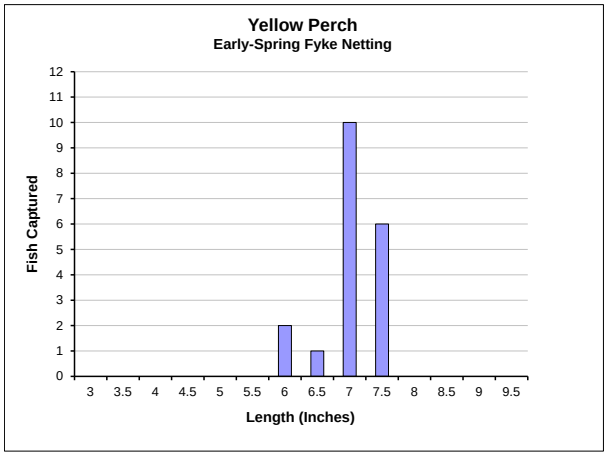
Captured 0.8 per net-night ≥ 14"	
Quality Size ≥ 21"	56%
Preferred Size ≥ 28"	11%



Early spring fyke nets depict a northern pike population whose abundance and length distribution we rate as unsatisfactory, based on stated angler opinions and preferences for pike in several nearby waters. Similarly, yellow perch in early spring fyke nets were too few and too small to draw anglers' attention. The scarcity of yellow perch, a favored food of northern pike, muskellunge, walleye, and largemouth bass, may be partially responsible for the status of those populations. Low rates of recruitment, survival, and growth in the yellow perch population may be closely related to presumed low concentrations of nutrients that drive production of algae and plankton—essential food of young, carnivorous perch. Because productivity appears to be limited by environmental conditions, we cannot offer an effective management strategy to make perch and pike populations more desirable to anglers.

Yellow Perch

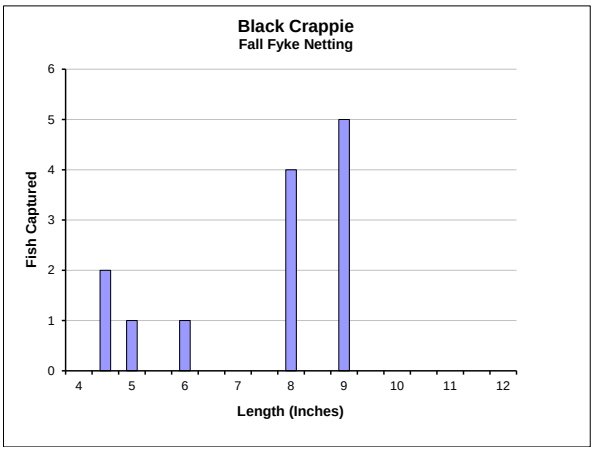
Captured 1.6 per net-night ≥ 5"	
Quality Size ≥ 8"	0%



Black Crappie

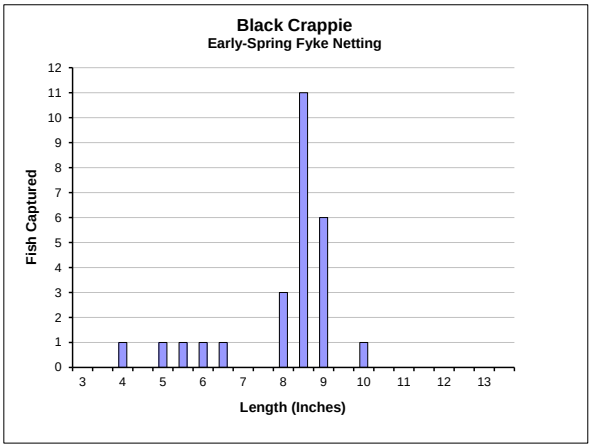
Fall Fyke Netting

Captured 1.8 per net-night ≥ 5"	
Quality Size ≥ 8"	82%
Preferred Size ≥ 10"	0%



Early-Spring Fyke Netting

Captured 2.1 per net-night ≥ 5"	
Quality Size ≥ 8"	84%
Preferred Size ≥ 10"	4%



Netting surveys in fall and early spring both characterize (nearly identically) the black crappie population at very low abundance with virtually no fish of the size that anglers prefer. Age estimates from scales portray a slow-growing population primarily comprised of crappie hatched in 2004 and 2005, most of which will soon die of natural causes. Crappies attain 8.6 inches in 7 years (n = 5) and 9.2 inches in 9 years (n = 2)—two inches shorter than the regional average length at those ages. Crappie starting the year 7.5 to 9.0 inches long gained on average 0.5 inches by the end of the growing season (n = 9). In clear unfertile lakes slow-growing crappie are unlikely to survive long enough to produce desirable proportions of preferred size fish. The daily bag limit of 25 panfish in effect statewide accommodates anglers who wish to keep crappie 8 – 9 inches long. More restrictive harvest regulations probably will not increase crappie population abundance or improve its size structure.

Survey data collected and analyzed by: Kendal Patrie, Rebecca Pawlak, Greg Rublee, and Jeff Scheirer—WDNR Fishery Team, Park Falls.

Written by: Jeff Scheirer—Fishery Biologist, January 15, 2013

Reviewed by: Dave Neuswanger—Hayward Field Unit Supervisor, January 17, 2013

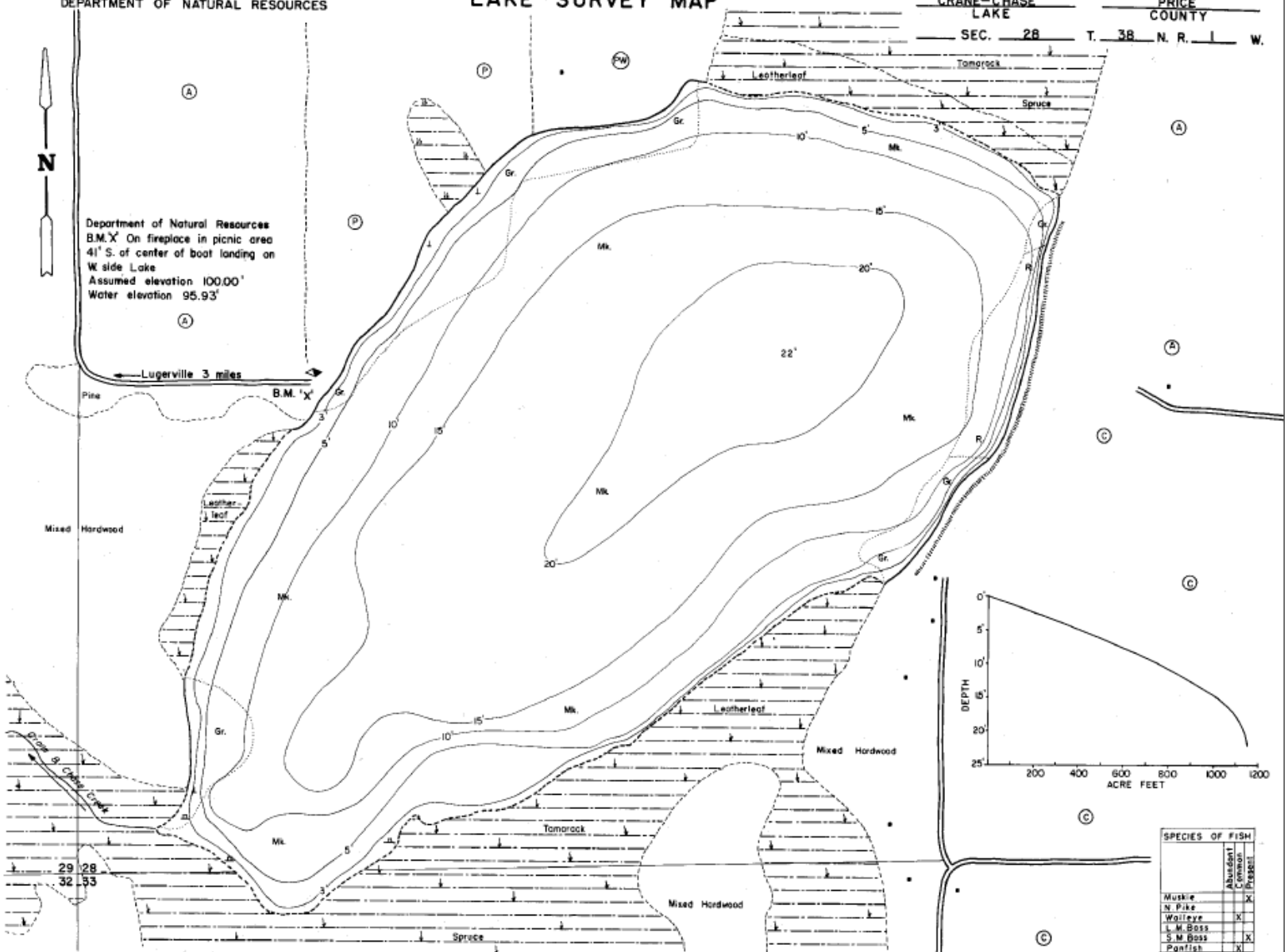
Approved for web posting by: Steve Avelallemant—Northern Administrative District Supervisor, May 29, 2013

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

LAKE SURVEY MAP

CRANE-CHASE LAKE — PRICE COUNTY

SEC. 28 T. 38 N. R. 1 W.



SPECIES OF FISH	Abundant	Common	Present
Muskie			X
N. Pike			
Walleye		X	
L.M. Bass			
S.M. Bass			X
Panfish		X	
Trout			

EQUIPMENT RECORDING SONAR MAPPED SEPT. (MO.) 1968 (YR.)

WATER ELEV. 95.93'

TOPOGRAPHIC SYMBOLS

- (B) Brush
- (PW) Partially wooded
- (W) Wooded
- (C) Cleared
- (P) Pastured
- (A) Agricultural
- B.M. Bench Mark
- Dwelling
- Resort
- Steep slope
- Indefinite shoreline
- Marsh
- Spring
- Intermittent stream
- Permanent inlet
- Permanent outlet
- Dam

LAKE BOTTOM SYMBOLS

- P. Peat
- Mk. Muck
- C. Clay
- M. Marl
- Sd. Sand
- Sf. Silt
- Gr. Gravel
- R. Rubble
- Br. Bedrock
- T Submergent vegetation
- Emergent vegetation
- Floating vegetation
- Stumps & Snags

◇ Access ◇ Access with Parking ◆ Boat Livery

Field work by: C. Busch, C. Olson, I. Sather Drawn by: C. Hall

AREA 86.37 ACRES
UNDER 3FT. 5.0 %
OVER 20FT. 11 %
VOLUME 1151.84 ACRE FT.
TOTAL ALK. 38 P.P.M.
SHORELINE 1.51 MILES
MAX. DEPTH 22 FEET