Discussion

Deer Lake is a class 22 lake located northeast of Deer River, Minnesota. There is one public access on the southwest part of the lake. There were 373 homes or cabins counted during the 2005 survey, indicating moderate to high shoreline development. The 2002 lake management plan indicated muskellunge, smallmouth bass and walleye as the primary species of management with northern pike and largemouth bass as secondary species.

Muskellunge are difficult to sample with our standard sampling methods. In the 2005 survey, only one muskellunge was sampled in the gill nets and two in the trap nets. The most recent spring muskellunge assessment was conducted in 2003. Spring netting conditions were ideal for sampling muskellunge since the weather was relatively stable and water temperatures progressively increased. Of the 339 muskellunge captured (1.7/net) in the 199 trap nets, 72 were recaptures. The population was estimated at 600 fish or 0.15 fish/acre. The fish ranged from 26 to 50 inches with 79% being 42 inches or less.

Walleye gill-net catch rates have fluctuated considerably since the first assessment in 1948. The lowest catch rate was 2.3 fish/net in 1975 and the highest catch of 13.3 fish/net occurred in 1984. In 2005, the gill-net catch was 8.1 fish/net, which exceeded the lake class median of 6.6 fish/net. The catch did not attain the aggressive management goal of 11 walleye/gill net. However, the catch rate was good considering that regular stocking in an effort to meet the goal began in 2001. Prior to 2000, the goal of our stocking regime was to allow for evaluation of natural reproduction. Due to the large, deep nature of the lake, spring water temperatures increase slowly, resulting in delayed production of zooplankton relative to shallow, darker lakes. As a result, it appears walleye fry do not have sufficient food to survive after hatching. Therefore, fingerling walleye stocking would be required to provide a fishable population.

The walleye population appeared to be in good condition based on the size and age structures sampled. Walleye from 9.8 to 28.2 inches were sampled and they had a mean length of 15.2 inches. Size structure values for PSD, RSD-P, and RSD-M were 45, 11 and 4, respectively.
Eight year classes were identified by scale and opercle analysis. The 2003 (54%) and 2001 (30%) year classes represented the majority of the sample and both corresponded to stocked years. Walleye growth was good with age-4 fish averaging 16.3 inches. Mean back-calculated length-at-ages were similar to statewide averages for all ages.

Largemouth bass were sampled with spring night electrofishing in 1995, 2000, and 2005. Catch rates have increased substantially from 2.2 fish/hr in 1995 to 45.0 fish/hr in 2005. In 2005, the sampled fish ranged from 5.1 to 13.9 inches and had a mean length of 9.8 inches. Six year-classes were sampled from two to seven years old. Age-3 and -4 fish represented 82% of the sample. Growth was poor compared to the statewide averages. However, most mean back-calculated lengths remained within 15% of the statewide average.

Smallmouth bass were also sampled with spring night electrofishing in 1995, 2000, and 2005. Catch rates followed a similar trend as for largemouth bass. From 1995 to 2005, the smallmouth bass electrofishing catch increased from 17.3 fish/hr to 55.9 fish/hr. In 2005, the fish ranged from 3.9 to 18.6 inches and had a mean length of 8.9 inches. Eight year classes were sampled from two to nine years old with age-2 through and age-4 fish representing nearly 81% of the sample. Growth was slower than statewide averages for all ages.

Northern pike gill-net catch rates have always been below the lake class 1st quartile of 3.0 fish/net. The highest catch rate of 1.1 fish/net occurred 1948 and 1984. In 2005, the gill-net CPUE was 0.5 fish/net. Low northern pike numbers frequently results in good size structure. Northern pike ranged from 23.8 to 34.6 inches and had a mean length of 27.4 inches. Size structural indices had PSD, RSD-P, and RSD-M values of 100, 29 and 14. Five year classes were identified by age analysis ranging from age 3 to age 8. Growth exceeded statewide averages for all ages (>15%). Northern pike averaged 26.3 inches by age 4.

The black crappie population has always been low and will likely remain low due to the lack of suitable habitat. Black crappie were only sampled by trap nets once between 1948 and 1990 and were first sampled by gill nets in the 2000 assessment. Black crappie gill-net and trap-net catch rates were both 0.7 fish/net in 2005. Both gear type catches were near their respective lake class median. Black crappie ranged from 7.2 to 11.8 inches for the combined gears. Three year classes were identified from age 3 to age 6, with age-3 fish representing 90% of the sample. Mean

back-calculated length-at-ages were similar to those reported for statewide averages.

Bluegill were seldom sampled prior to the 1990 population assessment (0.2 to 2.7 fish/trap net). Bluegill catch rates have increased substantially beginning in 1990 with a catch of 21.0/net, followed by 23.9/net in 1995, 10.5/net in 2000, and 32.0/net in 2005. Bluegill catch rates have been near or above the lake class median of 15.3 fish/net in the last four assessments. Bluegill lengths ranged from 3.2 to 8.0 inches, with a mean of 5.4 inches. Six year classes were sampled from two to seven years old. Age-4 and age-6 fish each represented 35% of the sample. Growth was slow compared to lake class 22 means, with most back-calculated lengths near 85% of the class means.

Tullibee, due to their pelagic nature, are difficult to sample with our standardized, summer assessments. As a result, tullibee catch rates are generally low but they can be highly variable. In 1948, the gill-net catch rate was 11.2 fish/net but in the next assessment in 1975 none were captured. In 1980, 8.6 tullibee/net were sampled but in the next five assessments the highest catch was 0.3 fish/net. None were sampled in gill nets in 2005. Anecdotal information indicates there is an abundance of tullibee in the lake and the sampling methodology has not accurately reflected the population.

The yellow perch population has been relatively stable remaining between the 1st and 4th quartiles for all assessments. In 1948, the catch was 11.8 fish/gill net (lowest on record), and catches have gradually increased to 32.2 fish/gill net (highest on record) in 2005. Yellow perch lengths ranged from 5.5 to 11.4 inches and had a mean length of 7.9 inches. Seven year classes were sampled in 2005 indicating consistent recruitment. Growth was slow compared to the statewide averages but was still within 15% of the mean. Yellow perch are probably more important within the fish community as a prey source than as a species desired by anglers.

Status of the Fishery

Deer Lake is a 4,097 acre lake located northeast of Deer River, Minnesota. There is one public access on the southwest part of the lake. There were 373 homes or cabins counted during the 2005 survey, indicating moderate to high shoreline development. The 2002 lake management plan indicated muskellunge, smallmouth bass and walleye as the primary species of management with northern pike and largemouth bass as secondary species.

Muskellunge are difficult to sample with our standard sampling methods. In the 2005 survey, only one muskellunge was sampled in the gill nets and two in the trap nets. The most recent spring muskellunge assessment was conducted in 2003. Spring netting conditions were ideal for sampling muskellunge since the weather was relatively stable and water temperatures progressively increased. Of the 339 muskellunge captured (1.7/net) in the 199 trap nets, 72 were recaptures. The population was estimated at 600 fish or about one fish for every seven acres. The fish ranged from 26 to 50 inches with 79% being 42 inches or less.

Walleye catch rates have fluctuated considerably since the first assessment in 1948. The lowest catch rate was 2.3 fish/net in 1975 and the highest catch of 13.3 fish/net occurred in 1984. In 2005, the catch was 8.1 fish/net, which was above average for this type of lake. The catch did not attain the aggressive management goal of 11 walleye/gill net. However, the catch rate was good considering stocking in an effort to meet the new goal only began in 2001. Prior to 2000, one of the goals of our stocking regime was to allow for evaluation of natural reproduction. Due to the large, deep nature of the lake, spring water temperatures increase slowly, resulting in delayed production of zooplankton relative to shallow, darker lakes. As a result, it appears walleye fry do not have sufficient food to survive after hatching. Therefore, fingerling walleye stocking would be required to provide a fishable population.

The walleye population appeared to be in good condition based on the size and age structures sampled. Walleye from 9.8 to 28.2 inches were sampled and they averaged 15.2 inches. Eight year classes were identified by scale and opercle analysis. The 2003 (54%) and 2001 (30%) year classes represented the majority of the fish sampled and both corresponded to stocked years. Walleye growth was good with four year old fish averaging 16.3 inches. Growth was similar to statewide averages for all ages.

Largemouth bass were sampled with spring electrofishing in 1995, 2000, and 2005. Catch rates have increased substantially from 2.2 fish/hr in 1995 to 45.0 fish/hr in 2005. In 2005, the sampled fish ranged from 5.1 to 13.9 inches and averaged 9.8 inches. Six year-classes were sampled from two to seven years old. Three and four year old fish represented 82% of the sample. Growth was poor compared to the statewide averages.

Smallmouth bass were also sampled with spring night electrofishing in 1995, 2000, and 2005. Catch rates followed a similar trend as for largemouth bass. From 1995 to 2005, the smallmouth bass electrofishing catch increased from 17.3 fish/hr to 55.9 fish/hr. In 2005, the fish ranged from 3.9 to 18.6 inches and had a mean length of 8.9 inches. Eight year classes were sampled from two to nine years old. Fish from two to four years old represented nearly 81% of the sample. Growth was slower than statewide averages for all ages.

Northern pike net catch rates have always been low when compared to similar lakes. The highest catch rate of 1.1 fish/net occurred 1948 and 1984. In 2005, the catch was 0.5 fish/net. Low northern pike numbers frequently results in good size distributions. Northern pike ranged from 23.8 to 34.6 inches and averaged 27.4 inches. Five year classes were identified by age analysis ranging from three to eight years old. Growth was fast compared to the statewide average. Northern pike averaged 26.3 inches after four years of growth.

The black crappie population has always been low and will likely remain low due to the lack of suitable habitat. Black crappie were only sampled by trap nets once between 1948 and 1990 and were first sampled by gill nets in the 2000 assessment. Black crappie gill-net and trap-net catch rates were both 0.7 fish/net in 2005. Both gears sampled black crappie near the lake class average. The fish ranged from 7.2 to 11.8 inches for the combined gears. Three year classes were identified from age 3 to age 6, with age-3 fish representing 90% of the sample. Growth was similar to the statewide average.

Bluegill were seldom sampled prior to the 1990 population assessment (0.2 to 2.7 fish/trap net). Bluegill catch rates have increased substantially beginning in 1990 with a catch of 21.0/net, followed by 23.9/net in 1995, 10.5/net in 2000, and 32.0/net in 2005. Bluegill catch rates have been near or above the lake class average of 15.3 fish/net in the last four assessments. Bluegill lengths ranged from 3.2 to 8.0 inches, with an average of 5.4 inches. Six year classes were sampled from two to seven years old. Age-4 and age-6 fish each represented 35% of the sample. Growth was slow compared to other lake similar to Deer Lake.

Tullibee, due to their pelagic nature, are difficult to sample with our standardized, summer assessments. As a result, tullibee catch rates are generally low but they can be highly variable. In 1948, the catch was 11.2 fish/net but in the next assessment in 1975 none were captured. In 1980, 8.6 tullibee/net were sampled but in the next five assessments the highest catch was 0.3 fish/net. None were sampled in 2005. Anecdotal information indicates there is an abundance of tullibee in the lake and the sampling methodology has not accurately reflected the population.

The yellow perch population has been relatively stable, ranging from a low of 11.8 fish/net in 1948 to a high of 32.2 fish/net in 2005. Yellow perch lengths ranged from 5.5 to 11.4 inches and averaged 7.9 inches. Seven year classes were sampled in 2005 indicating consistent reproduction. Growth was slow compared to the statewide averages. Yellow perch are probably more important within the Deer Lake fish community as a prey source than as a species desired by anglers.

Other species observed during the lake survey included banded killifish, blacknose shiner, bowfin, brassy minnow, common shiner, creek chub, hybrid sunfish, Iowa darter, Johnny darter, lake whitefish, logperch, pumpkinseed sunfish, rock bass, spottail shiner, and white sucker.

In order to maintain or improve fish and wildlife populations, water quality and habitat must be protected. People often associate water quality problems with large-scale agricultural, forestry, urban development or industrial practices in the watershed. In reality, the impact of land use decisions on one lake lot may be relatively small, yet, the cumulative impact of those decisions on many lake lots can result in a significant decline in water quality and habitat. For example, removing shoreline and aquatic vegetation, fertilizing lawns, mowing to the water's edge, installing beach sand blankets, failing septic systems and uncontrolled run-off, all contribute excess nutrients and sediment which degrade water quality and habitat. Understanding these cumulative impacts and taking steps to avoid or minimize them will help to insure our quality fisheries can be enjoyed by future generations.

2/21/2006

Area Fisheries Supervisor Date

02-27-2006

Regional Fisheries Manager Date