

2004 Lake St. Lawrence Warmwater Fisheries Assessment

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A cooperative fisheries assessment program for Lake St. Lawrence was initiated between the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of Natural Resources (OMNR) in 1986. This program originated as an extension of the Thousand Islands and Middle Corridor assessment programs and is intended to measure long term trends in relative abundance, growth, age structure and condition of the fish community. Since 1996 the Lake St. Lawrence program has been maintained by NYSDEC.

Methods

Standard St. Lawrence River multifilament gill nets measuring 200 ft long by 8 ft deep were used. Nets had eight panels measuring 25 ft, with mesh arranged in increasing size from 1.5-6 in stretch measure. Conversion of the net gear to monofilament did not occur in 2004 as anticipated but is planned for 2005.

Gill nets were set overnight and fished an average of 18.4 hours at standard New York (n=16) and Ontario (n=16) sites described by Klindt and Town (2002). Net sites were stratified in equal number by depth as shallow and deep (12-25 ft. and 30-50 ft, respectively).

Data collected from fish included total length (TL), weight, sex, and stage of maturity. Scale samples were taken from percids and centrarchids for age analysis. Cleithra were removed from northern pike for more reliable age determination.

Results and Discussion

The 2004 Lake St. Lawrence assessment was

conducted from 20 to 23 September. Surface water temperatures ranged from 62-64° F. A sample of 310 fish comprising 19 species was collected (Table 1). The catch was dominated by rock bass (25.8%), smallmouth bass (22.9%), yellow perch (18.3%), and walleye (7.4%). Total catch per unit effort (CUE) decreased by 30.8% from 2003 to 9.69 fish/net/night, which is below the long term average of 17.4. This was the lowest catch ever recorded for this assessment, primarily due to the decline of yellow perch. Round goby (*Neogobius melanostomus*) appeared in this assessment for the first time in 2004.

Yellow perch CUE declined precipitously (59%) from 2003 (4.34 fish/net/night) to an all time low CUE of 1.78 (Figure 1). The strong 1999 year class is not contributing significantly to the population as age-5 fish. The presumed strong 2001 year class, which should be fully recruited to our gear at age-3, is not making the expected contribution to the total population. The reduction in yellow perch does not appear to be related to year class strength, but to a general decline affecting all age and size groups. The highest proportional loss occurred in fish 5-7 inches, and ages 3-4 (Figures 2 and 3, respectively).

Localized impacts on yellow perch populations from predation by double-crested cormorants (*Phalacrocorax auritus*) have been reported previously in Lake St. Lawrence (Klindt and Town 2003, 2004). Regurgitated cormorant pellets were collected in 2004 by NYSDEC from Strachan Island, located in the lowermost portion of the fisheries assessment area. Pellet analysis described by Johnson et al. (2005) indicated that diet was comprised predominantly of yellow perch (53.0%). Total number of yellow perch consumed at the

colony in 2004 was estimated at 0.93 million, a decrease of approximately 41% from the 2003 estimate of 1.57 million (Johnson et al. 2005). The number of active nests at Strachan Island decreased (27%) from 332 in 2003 to 244 in 2004 (J. Farquhar, NYSDEC, pers. communication).

Gill net sites were stratified by distance from the nesting colony as described by Klindt and Lantry (2001). Yellow perch CUEs for “upriver” and “colony” net strata were 1.64 and 1.93, respectively (Figure 4). It was anticipated that a strong 2001 year class would result in “upriver” strata CUEs to maintain or increase as it fully recruited to our sample gear, regardless of predation from the Strachan Island cormorant colony. The abrupt decline in CUE in both strata may indicate that intense predation has shifted upstream beyond the “colony” strata. The perch population apparently can no longer compensate for predation by cormorants.

Smallmouth bass CUE (2.22) increased in 2004 and is near the long term average of 2.25 fish/net/night (Figure 5). Bass CUEs have been relatively stable since 1998. In 2004, the length-frequency distribution was dominated by fish greater than 14 inches in length (Figure 6) which includes fish ages 5 and greater (Figure 7). Age-4 fish were not represented in the 2004 assessment. Anglers have recently expressed concern over the lack of small bass (<12") in their catch, however, the presence of bass <12" in the length-frequency distribution (Figure 7) indicates continued recruitment.

Mean length of smallmouth bass at age-6 in Lake St. Lawrence continues to show an increasing trend (Figure 8) as reported in Klindt and Town (2004). A similar trend has been reported for smallmouth bass in the Thousand Islands (McCullough and Town 2004) and in Lake Ontario (Eckert 2004)

Walleye CUE (0.72) decreased approximately 44% from 2003 and has dropped below the long term average of 1.24 fish/net/night (Figure 9). This is the lowest CUE reported since 1994. The 1999 year class continues to do well as age-5 fish. Age-1 fish dominate the length and age frequency distributions

(Figures 10 and 11, respectively).

Northern pike CUE (0.47) decreased slightly from the 2003 assessment and falls slightly below the long term average of 0.54 fish/net/night (Figure 12).

Total length of northern pike ranged from 9.7-29.1 inches (Figure 13). The bulk of the catch was evenly distributed between age 3-5 fish (Figure 14). Due to the nature of Lake St. Lawrence and the netting strategy, northern pike are poorly represented in this assessment.

References

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