Calibration of Index Netting Methods: How Many Fish are in the Lake?

Nigel Lester[1], Tamara Janoscik[2], Brian Monroe[3]

[1] Applied Research and Development Branch, Ontario, MNR,
1235 Queen St E. Sault Ste Marie, ON, P6A 2E5
nigel.lester@mnr.gov.on.ca
(705) 755-1548

[2] Department of Zoology, University of Toronto
25 Harbord Street, Toronto, ON, M5S 3G5
tamara.janoscik@utoronto.ca
(416) 978-3470

[3] Algonquin Fisheries Assessment Unit, Ontario, MNR
Box 219, Whitney, ON, K0J 2M0
brian.monroe@mnr.gov.on.ca
(613) 637-2780 ext.274

Index fishing is a standard method of fishing. Standards are defined for the type of gear, its method of deployment, when it is used (time of year, time of day), and the design for selecting sampling sites. These standards ensure that the data collected on different lakes are comparable. Ontario's Fisheries Assessment Unit (FAU) network has developed several standards aimed at different species of fish. Spring Littoral Index Netting (SLIN) is a method for assessing lake trout abundance and mortality rate (Lester *et al.* 1991). It sets small mesh gillnets (25, 38, 52 mm) in the littoral zone during the spring for 1.5 hour periods. Because large fish are entangled, not wedged, by the gear it is a low impact method of sampling the adult segment of the population.

An exploitation model developed by Shuter *et al.* (1998) supplies criteria for evaluating the status of lake trout populations based on abundance and mortality rate (Lester and Dunlop 2000). In order to use SLIN in testing whether abundance is being sustained above critical levels, the relationship between SLIN, catch per unit effort (CUE) and lake trout abundance must be determined. This calibration is being done on FAU lakes where estimates of lake trout abundance have been obtained from mark-recapture studies or angling harvest data. The results indicate that CUE increases with density, but this relationship is dependent on the lake surface area. For a given fish density (population size/lake area), CUE is higher on larger lakes. The results supply a formula for estimating lake trout density from index fishing, CUE, and lake area. Because confidence limits placed on this estimate are large, SLIN will not supply a precise estimate of lake trout abundance for an individual lake. However, the method does supply a rapid assessment technique that can be used to evaluate the status of a population of lakes.

References

Lester, N.P., M.M. Petzold, W.I. Dunlop, B.P. Munroe, S.D. Orsatti, T.Schaner, and D.R. Wood, 1991. *Sampling Ontario Lake Trout Stocks: Issues and Standards*. Ontario MNR, Lake Trout Synthesis, Toronto. 117 p.

Lester, N.P. and W.I. Dunlop, 2000. *Monitoring the State of the Lake Trout (Salvelinus namaycush) Resource: A Landscape Approach*. Ontario Ministry of Natural Resources, Peterborough, Ontario.

Shuter, B.J., M.L. Jones, R.M. Korver, and N.P. Lester. 1998. A general, life history based model for regional management of fish stock; the inland lake trout (*Salvelinus namaycush*) fisheries of Ontario. *Canadian Journal of Fisheries and Aquatic Science,* 55: 2161-2177.