

ABSTRACT

Large-mesh trap nets, which are used in Lake Michigan for harvesting lake whitefish *Coregonus clupeaformis* commercially, were modified to determine if gilling mortality of non-target species in the pot could be decreased significantly. Modifications were made by reducing the mesh size in the rear corners of the pot and over the tunnel using shoaling twine panels. One-half of each fisherman's nets were modified for each pot size he owned. Control nets were not changed in any way. Two fishermen from the port of Muskegon on Lake Michigan were both monitored a minimum of twice weekly from May to October during 1985 and 1986. Results indicated that changes made to the nets were effective in reducing incidental gilling mortality of non-target species in the modified areas. This decrease was especially significant in the area over the tunnel of the net. However, mortalities were not significantly different for any of the non-target species studied when comparing total performance of control and modified nets. The effects of water temperature at the pot, water depth at the pot, and soak time was not correlated with either whitefish harvest or gilling rates observed for non-target species. Modifications had no detrimental effects on whitefish harvest and, in fact, modified nets harvested significantly higher numbers of whitefish than did control nets in many of the months sampled. Lake trout *Salvelinus namaycush* was the most abundant non-target species in the nets with 72 caught per lift ($18,389 \pm 4,545$ fish) in 1985 and 88 per lift ($46,960 \pm 6,406$ fish) in 1986. Approximately 1,500 of the lake trout caught each year died as a result of gilling. The remaining non-target species studied occurred in the nets in relatively small numbers when compared to lake trout. Yellow perch *Perca flavescens* had the highest abundance of these species, totalling 2,397 (± 404) fish caught in both years combined. They were followed by salmon *Oncorhynchus* spp. (947 ± 168 fish), walleye *Stizostedion vitreum* (769 ± 215 fish), brown trout *Salmo trutta* (202 ± 63 fish), and steelhead *Salmo gairdneri* (47 ± 41 fish), in that order. On the average, 60% to 80% of all yellow perch, salmon, and steelhead caught each year died from gilling, compared to only 20% for brown trout and 13% for walleye. Gilling of lake trout in the pots of these nets (4.5-inch stretched mesh) was very selective. Average age of lake trout gilled ranged from 5.5 to 5.8 years with an average size of 23.6 to 24.3 inches. Recommendations are discussed that have potential for reducing the non-target mortalities observed in this fishery. These include season closures, gear restrictions, and other types of net modifications. At a minimum, a shoaling twine panel in the top of the pot over the tunnel area should be enforced in all large-mesh trap-net fisheries.