

## Chestnut lamprey predation on caged, and free-living brown trout in the upper Manistee River, Michigan

Andrew J. Nuhfer

Michigan Department of Natural Resources  
Hunt Creek Fisheries Research Station  
Route #2, Box 2299  
Lewiston, Michigan 49756

*Abstract.*—From 1989-91 brown trout *Salmo trutta* of different sizes (15-41 cm) were caged in the Manistee River and exposed to predation attacks by chestnut lampreys *Ichthyomyzon castaneus* during spring and summer test periods. Fishery survey and angler catch data was used to estimate percentages of free-living trout attacked by lamprey. Larger trout were more likely to be preyed upon, both in cages, and in the wild. Larger trout in cages, or the wild, were also more frequently observed attacked simultaneously by more than one lamprey. From 0-100% of caged trout were attacked depending upon the test period. Attack rates on caged trout were generally highest during July. Over 76% of the lamprey marks on caged trout during 1990-91 were on the prey's dorsal region. Lamprey marks or attached lamprey were rarely observed on free-living trout in sections of the Manistee River upstream from the County Road 612 bridge in Crawford County. However, from 0-90% of trout observed in river sections between the M-72 bridge in Crawford County, and the Sharon Bridge in Kalkaska County, had been attacked by lamprey.

Mortality of caged trout due solely to lamprey attack could not be reliably estimated due to the confounding effects of such stress factors as confinement, intermittent high water temperatures, and disease. Depending on the year, test site, and test period, from 0 to 100 percent of trout attacked in various test groups died. However, from 4 to 80 percent of brown trout not attacked, also died during the same test periods.

Chestnut lamprey *Ichthyomyzon castaneus* inhabit at least 13 stream systems in Michigan's Lower Peninsula. They also occur in an additional 28 tributaries and are believed to occupy approximately 1,700 lineal miles of Michigan streams, all within Lake Michigan's drainage (Morman 1979). Chestnut lamprey occur primarily in the main branches of large streams and are rarely found in headwaters or small tributaries (Morman 1979). The five largest populations, based on distribution and density of larvae, occur in the St. Joseph, Muskegon, Pere Marquette, White, and Grand Rivers (Morman 1979). Hall (1963) believed,

however, that the most dense population was in the Manistee River, based on estimated populations of the parasitic-phase chestnut lamprey. Crowe (1959) reported that chestnut lamprey were particularly abundant in waters of the Manistee River between the M-72 bridge in Crawford County and a point midway between Riverview and Sharon in Kalkaska County (Figure 1). The stable flow, good water quality, and extensive sand beds on the bottom of the Manistee River provide excellent habitat for chestnut lamprey ammocoetes (Hall 1963; Morman 1979). Scott and Crossman (1973) reported that these