

**Dynamics in Lake Superior of Hatchery and Wild Steelhead
Emigrating From the Huron River, Michigan**

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Abstract.—We studied recruitment, survival and growth in Lake Superior of hatchery and wild steelhead *Oncorhynchus mykiss* emigrating from the Huron River, Michigan. We monitored the emigration of marked Little Manistee (Lake Michigan) stock hatchery smolts and wild emigrants with smolt traps near the river mouth in 1987-1988. Each spring 1988-1992 we monitored returns with a trap net in the lower river, and the riverine sport fishery with a census. Hatchery smolts survived transportation and stocking well, and migrated quickly from the river. Adult returns of stocked fish were low and contributed only about 3% to total adult runs. Survival in Lake Superior was 0.05% or less. Larger smolts (>210 mm) had relatively high survival, based on a comparison of smolt total lengths with those back-calculated from adult scales. Returns of marked fish from distant locations indicated a possible lack of homing to the Huron River. The yield of wild emigrant steelhead was low and variable between years. Age-1 parr and smolts made up a substantial portion (21-66%) of the emigrant population. Returning adult populations were likewise low in number. Survival in Lake Superior of wild emigrants was fairly high (at least 11%). We found no effects of size on survival of wild emigrants. In contrast, based on emigration dates back-calculated from adult scales, survival increased dramatically for fish that emigrated after about the third week in May. Age-1 emigrants, which migrated in June, had much higher survival rates than age-2 smolts, which migrated in May. Survival to repeat-spawn was high (about 75%) and 54% of all returning adults were repeat spawners, many of which had spawned several times. Poor returns of hatchery smolts may have been due to either early emigration when conditions for survival in the lake were poor (related to the abundance of predators or food) or poor imprinting. Survival of stocked fish may be enhanced by use of a local wild stock, more adapted to the rigorous Lake Superior environment, for supplementation of wild populations in this region.