

Evaluation of the Reintroduction of the Arctic Grayling into Michigan Lakes and Streams

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Abstract.—Between 1987 and 1991 the State of Michigan stocked 145,000 yearling Arctic grayling *Thymallus arcticus* into 13 inland lakes and 7 streams in northern Michigan. Arctic grayling were reared in Michigan. Eggs sources were wild Arctic grayling populations in Meadow Lake, Wyoming (1987-1990 stockings) and Providence Creek, a tributary of the Mackenzie River, Northwest Territories, Canada (1988 stocking). Arctic grayling survived well in lakes where other fish species were either absent or sparse. Good survival to age 5 occurred in only one lake which was closed to fishing, patrolled to detect poachers, and held only a few brook trout *Salvelinus fontinalis* competitors. Predation by fish, competition for food, episodes of low pH (in some Upper Peninsula lakes), hooking mortality, illegal harvest, and furunculosis infections present in stocked Arctic grayling were the probable causes of the high mortalities observed in many lakes.

Most Arctic grayling stocked in rivers disappeared within 6 months. It appeared that most Arctic grayling quickly migrated from the stocking site in both small Upper Peninsula streams and larger Lower Peninsula streams. Migration downstream into river reaches and impoundments with high temperatures and large populations of predatory and competitive fish species probably caused large losses of Arctic grayling stocked in the Lower Peninsula rivers. Dams on these rivers block movement back upstream. Additional mortality was attributed to furunculosis infections, and possibly to parasitism by Chestnut lamprey *Ichthyomyzon castaneus* in the Manistee River.

Arctic grayling generally grew well the first season in lakes where there were few other fish species and where food (such as zooplankton) was abundant. Arctic grayling growth beyond the first year was good in some, but not all, lakes where the density of Arctic grayling and other fish species was low. Most Arctic grayling in rivers accrued little growth before they disappeared.

At least 70% of East Fish Lake and Fuller Pond Arctic grayling were mature at age 3 at total lengths of about 27-29 cm.. Some fast-growing Arctic grayling matured at age 2 in lakes. Ripe age-3 male and female Arctic grayling from Fuller Pond were the same size as age-2 ripe Arctic grayling from East Fish Lake. Mature Arctic grayling did not migrate into the inlet tributaries of either East Fish Lake or Fuller Pond although both tributaries appeared to have good spawning habitat. Arctic grayling did however, (during the April-May spawning period) move into the lake outlet streams where they were caught in fish traps. No reproduction of Arctic grayling was detected in any Michigan lake or river. Many Arctic grayling were caught by anglers from lakes where Arctic grayling survival was good. Most Arctic grayling caught by anglers from rivers were caught at a small size during the first few months after they were stocked. Hooking mortality of 355 Arctic grayling caught from lakes on artificial flies and lures was 1.7%.