

# Current Projects - Lakes, Ponds and Reservoirs

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## Contribution and Survival of Stocked Muskellunge, and Population Dynamics of Adult Muskellunge in Spirit, East Okoboji, West Okoboji, and Clear Lakes

Muskellunge are produced in Iowa hatcheries and stocked in natural lakes and reservoirs to provide anglers with “trophy” angling opportunities. Efficient stocking strategies are necessary to reduce production costs and to provide desired muskellunge population densities. Our objective was to evaluate the stocking contribution and survival of pellet-reared and minnow-reared muskellunge stocked in either the fall (fingerlings) or spring (yearlings). Beginning in 1991, all muskellunge fingerlings stocked into Spirit and West Okoboji Lakes in Northwest Iowa were marked with freeze brands to differentiate the type and year muskellunge were stocked. Adult muskellunge were caught each spring using gillnets and fish were examined for brands, individually marked with Visual Implant or Passive Integrated Transponder tags (PIT tags), and released into the same lake as captured. Survival of stocked muskellunge and contribution to year-classes were estimated from recaptures of branded and individually marked muskellunge. In most years, none of the pellet-reared fall stocked fingerlings survived. The poor survival of these fish was most likely due to a combination of poor health, poor color (camouflage barring was muted and virtually nonexistent), and small size (< 9 inches). Minnow-reared muskellunge fingerlings survived much better than pellet-reared fish, most likely due to their larger size (10-13 inches), better camouflage barring, and better health. Moreover, this research also discovered that minnow-fed yearlings stocked in the spring survived much better than these same fish stocked in the fall. To further our understanding of the factors that contribute to muskellunge stocking success, all yearling muskellunge stocked in natural lakes since 2010 have been implanted with PIT tags prior to stocking.

Muskellunge population densities in all lakes increased after the spring-stocked yearlings recruited into the gill nets. Adult muskellunge abundance met or exceeded management objectives every year since 2002 for the Okoboji lakes; however, muskellunge population objectives were not consistently met for other lakes. Emigration of muskellunge has contributed to some of the changes in population abundance. In addition, further research found that spring-stocked yearling survival to age-4 varied substantially among years (8.3-52.6%). Although survival rates for spring-stocked yearling muskellunge were considerably better than fall stocked fingerling muskellunge, inconsistent spring yearling and adult (60-95%) survival limited adult recruitment into the population. A model was developed that incorporated variable spring-stocked yearling and adult survival to predict adult densities at various stocking rates and frequencies. In order to meet management objectives, more (24-33%) fish and more frequent (annual) stockings of spring yearling muskellunge are required in Iowa’s lakes.

