Abstract:

Changes in species-specific angler behaviors from harvest-oriented to voluntary release have the potential to alter fish population and community characteristics. In Escanaba Lake, Vilas County, Wisconsin, targeted and indirect Muskellunge *Esox masquinongy* angler behavior changed from harvest-oriented to primarily voluntary catch-and-release (C&R) during the mid-1990s. Since the mid-1990s, the Muskellunge population has been lightly exploited (mean exploitation [*u*] < 0.05) despite no closed season, bag limit, or minimum length limit for Muskellunge and is now characterized as a C&R fishery. We tested for differences in Muskellunge adult density, age-0 relative abundance, and size structure indices as a consequence of changes in angler behavior and the subsequent reduction in exploitation. Prior to the shift in angler behavior, the Muskellunge population exhibited characteristics of an exploited fishery (e.g., lower adult size structure, high and more variable natural recruitment). After C&R practices became prevalent, the Muskellunge population exhibited characteristics of an unexploited fishery (e.g., larger adult size structure, low and less variable natural recruitment). Voluntary release of Muskellunge is an angler behavior that is well recognized and promoted among present-day anglers. Our results suggest that naturally reproducing Muskellunge populations across their range may be expected to show similar characteristics of lightly exploited fisheries over time. We recommend that managers account for these changes in angler behavior and associated population responses, and adjust management strategies accordingly. In particular, stocking practices and harvest regulations need to be evaluated to ensure that those strategies are not negatively influencing Muskellunge population dynamics and other associated fish community characteristics.