

Evaluation of Sampling Methodologies of the Lake Michigan Creel Survey

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Abstract.—The Michigan Department of Natural Resources conducts creel surveys to characterize the Great Lakes sport fisheries and provide fisheries managers with information on catch composition, catch rates, and fishing pressure. Most anglers seek coho salmon *Oncorhynchus kisutch*, chinook salmon *O. tshawytscha*, and other salmonids, and approximately 800,000 salmonids are harvested annually from the Great Lakes. The creel survey is an access site survey with interviews and counts performed at ports along the Lake Michigan shoreline. Sportfishing access sites are discrete and a major portion of the fishing effort and catch occurs at relatively few sites. The creel survey was not designed to yield estimates of total catch and total effort for Lake Michigan, but rather to provide fishery managers with catch rate, sportfishing effort, and harvest estimates at specific sites. Although data from the Lake Michigan creel survey have met a critical need in fisheries management, the present fiscal climate requires a more economical operation. We examined the current (stratified) design with respect to how reduction and pooling of sites would affect precision of catch-rate and fishing-effort estimates; in particular, we considered the feasibility of monitoring the fisheries by surveying three northern and four southern sites in Lake Michigan. Estimates of mean fishing effort were significantly different among sites considered for pooling. In general, the current sampling intensity permitted detection of a 30% or 50% change in fishing effort with at least 75% certainty for boat and pier fisheries but not for shore fisheries. Although trends in fishing effort at the southern sites were similar to those at northern sites, catch rates of the five major salmonid species varied between northern and southern sites. Recent declines in chinook salmon catch rates may have resulted in increased fishing for rainbow trout *Oncorhynchus mykiss*, and lake trout *Salvelinus namaycush*, and coho salmon at the northern sites, and for coho salmon at the southern sites.

The fishery resources of the Great Lakes were dramatically altered by the introduction of Pacific salmonids in the mid-1960s. In the 25 years since the stocking of these exotic fishes, Great Lakes fisheries have provided

outstanding recreational opportunities. The new fisheries resulted from the efforts of various state and federal agencies: the Michigan Department of Natural Resources (MDNR) introduced coho salmon

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