

Evaluation of Sampling Techniques for the Lake Michigan Angler Survey

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Abstract.—The Lake Michigan angler survey currently uses the roving-access method for estimating angling effort and harvest at specific sites in State of Michigan waters. Sites are sampled with equal probability following a stratified random design. Four sampling techniques were evaluated to decrease sampling cost while maintaining or improving accuracy and precision of these estimates. Techniques were: determine site-to-site relationships for predicting angling effort; optimal allocation of clerk effort; proportional allocation of clerk effort; and bus route design. All four techniques were shown to be unsuitable replacements for current sampling techniques. Site-to-site relationships of angling effort were found to be inconsistent, while optimal allocation of clerk effort tended to direct more sampling effort towards sites having lower mean boat counts with greater variability. Proportional allocation of clerk effort provided inconsistent allocation based on boat angling effort and catch rates of walleye, yellow perch, or salmonines. Bus route design reduced number of survey clerks needed but increased overall cost of the survey.

Currently, estimates from specific sites are expanded to approximate lake-wide estimate for the year based on ratios from 1985 sample year. Updating and evaluation of 1985 ratios for expansion of sampled sites to approximate lake wide estimates is recommended. The ratios should be updated on a three-year interval.

The Michigan Department of Natural Resources, Fisheries Division conducts annual angler surveys at numerous sites along the Michigan waters of Lake Michigan. The purpose of these surveys is to estimate angling effort and harvest for the sport fishery (e.g., Rakoczy and Svoboda 1995). In addition to following annual trends in effort and harvest, data are used in conjunction with other research studies (e.g., Hesse 1994; Seelbach et al. 1994, Rybicki and Clapp 1996; Wesley 1996).

The Lake Michigan angler survey is described as a roving-access survey (Pollock et al. 1997). The survey clerk makes counts of angling effort (typically boat, shore or pier angling) from one or more vantage points at a site by “roving” within the bounds of the site, and anglers are interviewed as they complete their trip and are exiting the “access” site. This survey follows a stratified random sampling design and each site is sampled with equal probability. Either instantaneous or over-time interval counts are made to estimate angling