

## STUDY PERFORMANCE REPORT

**State:** Michigan

**Project No.:** F-80-R-4

**Study No.:** 508

**Title:** A profile of Michigan anglers: preferences, market segments and expenditures.

**Period Covered:** October 1, 2002 - September 30, 2003

**Study Objective:** (1) Summarize recent survey information on the preferences and activities of Michigan resident anglers; (2) Develop market segments for Michigan anglers; (3) Estimate fishing trip-related expenditures by Michigan anglers; and (4) Use the survey data to produce information that can enhance the design of future angler survey efforts.

**Summary:** Key trip segmenting variables include trip lengths, type of water body fished at, and species sought while angler segmenting variables include characteristics of typical/usual trip type and angler preferences for species and fishing site attributes. Job 4 is essentially complete and Job 5 is near completion. The final completion report will be delivered in 2003-4.

**Findings:** Jobs 4, 5, and 6 were scheduled for 2002-03, and progress is reported below.

**Job 4 Title:** Program statistical routines and estimate models for the market segments.—To create a profile of Michigan anglers, the survey data is being analyzed to determine alternative anglers segments that are useful for describing differences among anglers and the kinds of fishing behaviors they engage in. At the most general level, two kinds of segmenting have been explored: segmenting of behavior by fishing trips, and segmenting of anglers by angler characteristics. The two types of segmenting mirror the organization of the available data from the survey of anglers and their fishing trips. The angler layer of the data contains data on the 2,135 anglers that completed all survey waves. The angler layer includes demographics, information classifying their reasons for fishing, certain types of fishing preference data such as species preferences, and other angler preference information such as the importance of various attributes to fishing site selection. Each of these variables was explored as a possible segmenting variable. In the trip segmenting analyses, fishing trips are treated as the independent variables and the data describing 6,493 angler fishing trips is used to explore segments. At the trip level, variables include the characteristics of anglers from the angler layer as well as variables describing the actual activities of the trip such as trip length, type of water body fished, species sought, boat use, primary purpose, and number of sites visited. As with the variables at the angler layer, each of the variables at the trip layer has been examined for its utility in segmenting anglers.

In terms of methods, the basic approach was to test out each of the angler or trip variables to see if they served to significantly distinguish different segments of anglers. Because there are dozens of variables in each layer, this required running a large number of modified regression analyses. Standard multiple regression models were not used because the variables in the data set are not continuous. Four distinct methods for non-continuous dependent variables were employed in the segmenting analyses depending on the type of data. For count variables like the number of trips the angler took in the season, Poisson regression was utilized. For binary variables such as boat ownership, logit regression was adopted. For variables with three or more levels that are not ordered, e.g., favorite species to eat, multinomial logit models were used. For data that were

discrete, but that had a natural ordering, e.g., importance of parking to site selection, ordered logit was employed.

The large volume of results is being summarized and documented for the final completion report. The results indicate that some variables are better suited to use as angler segments based on their management interpretations and their explanatory power. For example, at the trip layer, segmenting by trip length or water body has higher explanatory power than do segments based on number of sites visited on a trip. Attempts to combine data across the trip and angler layers also raised some interesting points. For example, for the market segmenting based on species sought on a trip, there is a strong correlation between species sought on a trip, and angler statements about species they prefer to fish for (from the angler layer of data). While this lends validity to the angler level data because it shows that angler statements about their preferences correlate with their actual behavior, the angler segmenting of species sought on a trip is more informative for management purposes if these preference variables are not included.

This job is almost complete, though some alternative models are still under examination. The large volume of results are being documented and interpreted as part of the completion report.

**Job 5 Title: Relate angler expenditures to market segments.**—This job is partially complete. The trip-related expenditure data is coded and ready for regression analyses that estimate expenditure functions for the market segments. Many preliminary models have been run to relate expenditures to some of the key variables for the market segments. Final runs of the expenditure models will use the finalized versions of the market segments models from job 5. Though some changes may occur, general results are consistent with prior hypotheses. Trip-related expenditures were computed using the year one survey data. Though not collected for all trips in the survey database, the trip-related expenditures are available for the first 380 trips reported in the survey. These data include trip-related expenses for categories such as fuel, groceries, bait and tackle, parking, boat rentals, and lodging. Given the expenditure categories, it is not surprising that trip-related expenditures are positively related to trip length and travel distances. Recall that trip length was one of the key segmenting variables. Complete results and procedures, along with the source data, are being documented as part of the completion report.

**Job 6 Title: Prepare reports and publish findings.**—This report was prepared and oral presentations were given to research team and basin team members.

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