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# A Profile of the Minnesota Angler

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**ABSTRACT** — As part of an assessment of the bait leech industry and its market potential, a survey of 5,000 Minnesota anglers was conducted in the spring of 1985. Although the survey instrument was designed to derive information about the bait leech (*Nepheleopsis obscura*) and its use, it also included questions about angler characteristics, preferences, and fishing activities for the 1984 fishing season. Responses to these questions produced a profile of the Minnesota angler. Our survey results show that the typical Minnesota angler is male, middle-aged, has a relatively high household income, and has fished for many years. He fishes from a boat on a lake with other family members mainly for relaxation. He fishes 6 hours a day for 24 days during the summer fishing season. The typical Minnesota angler fishes mainly for walleye and prefers to catch several medium-sized fish as opposed to a limit of small but keeper-sized fish or one large fish. He does not own a cabin and does not belong to fishing clubs or organizations. He is most likely to read *Field and Stream* magazine but receives a great deal of his fishing information from friends. The household of the typical Minnesota angler has \$717 invested in fishing equipment excluding boat(s) and gasoline motor(s) and spends about \$165 per year on such equipment. He has access to 5.4 reels and 4.8 rods, is likely to use a depth finder when fishing, and uses a variety of different fishing techniques. He is a member of a household that owns an aluminum-hulled boat 15-16 feet long, powers it with a gasoline-powered outboard motor, and has about \$2,400 invested in boat(s), motor(s), and trailer(s). The typical Minnesota angler rated the 1984 fishing experience as average or better.

## Introduction

The Natural Resources Research Institute (NRRI) at the University of Minnesota, Duluth (UMD) is investigating the economic feasibility of commercially growing bait leeches (*Nepheleopsis obscura*) in Minnesota and marketing these leeches in major walleye-producing states throughout the country. As part of this research effort, a survey of Minnesota anglers (the Minnesota Fishing Survey) was conducted in order to improve knowledge of current and potential bait leech use and markets, and to help guide both biological investigations and market development activities. Although the survey instrument was designed to derive information about bait leech use, prices and desirability, it also included questions regarding angler characteristics, preferences, and fishing activities. Responses to these latter questions were used to develop a profile of the Minnesota angler.

Neither we nor personnel from the Minnesota Department of Natural Resources (DNR) are aware of a previously developed profile of the Minnesota angler. This is somewhat surprising given the importance of the recreation industry in general in the State of Minnesota and the economic and social significance of sport fishing in particular. In fact, on a national level, the 1985 Leisure Audit has determined that sport fishing is the second most popular recreation activity among adults in the United States (1). It has also been estimated that the direct and indirect economic impact of sport fishing on the national economy was about \$50 billion in 1985 (2).

Approximately 600,000 full-time equivalent jobs were supported by sport fishing in the United States in 1985 with these jobs employing close to 1,000,000 people (2). It would seem that the Minnesota angler profile information would be useful

for a variety of purposes including the marketing of the recreational experience and reviewing fishing resources management practices.

## Materials and Methods

The Minnesota Fishing Survey, conducted in the spring of 1985, asked respondents a variety of questions regarding their fishing experiences during the 1984 season. The survey was sent to 5,000 persons who had purchased one of six types of Minnesota seasonal fishing license in 1984. The survey sample sizes for each license type were set so that the proportion of each license sampled was roughly equal to the proportion of total license receipts, as tabulated by the Minnesota DNR for the 1984 season, a stratified random sample. The six types of fishing licenses, or strata, are listed in Table 1 along with the number of persons mailed a survey for each license type.

Table 1. Survey Sample size by license type.

License Type	Sample Size
Resident Individual Angling	1,993
Resident Combination Angling	1,214
Resident Individual Sportsman	144
Resident Combination Sportsman	195
Nonresident Individual Angling	514
Nonresident Combination Angling	940

Several limitations of this survey sample should be noted. First, the population from which the sample was chosen was not complete. Two other types of fishing licenses are sold in Minnesota: a nonresident 1-day license and a nonresident 7-day license. There were 118,363 of these licenses sold in 1984. Unfortunately, copies of these licenses were not available from the DNR and so anglers holding these licenses were

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not surveyed. However, given the relatively small number of these anglers as opposed to the more than 1.4 million holding the license types listed above, and given the limited amount of fishing activity inherent in the nature of these license types, it was judged that little would be lost by excluding them from the survey and analysis.

Two groups of Minnesota anglers were underrepresented in our survey. The first group was anglers not required to purchase licenses. This group includes anglers under 16 years of age or over 65 years of age. Some anglers in these age categories did buy licenses, however, and their answers have been weighted to account for their underrepresentation. The second group was women. For combination licenses, the first name on the license was the one that was surveyed; however, this was normally the male. For these reasons a weighting scheme was necessary to correct for the bias in the responses by age and sex categories. The weighting system was based on results from the 1978 Minnesota DNR comprehensive study of statewide outdoor recreation called SCORP (3). As part of the SCORP study, phone surveyors asked residents what recreational activities they participated in during a given week. One piece of information obtained was an estimate of the number of fishing occasions attributable to various age/sex categories. These estimates were used to devise a weighting system to correct for age and sex biases in our survey results.

A final weakness of our survey technique is that it relied on memory recall estimations of 1984 fishing activities, rather than written records or diaries. But the resulting bias or distortion of the estimations is indeterminate so no adjustments or weighting was done to account for this problem. This weakness is not unique to our survey, but is common to all memory recall estimation surveys.

The survey consisted of six pages of questions. Some of the questions were of the checklist type in that allowable responses were predetermined and the respondent checked which of those responses fit him/her best. Other questions were open-ended in which case the respondent was invited to write as much or as little as she/he desired. Some questions asked for very specific and detailed responses (e.g., What is your age?, How many outboard motors do you own?, etc.). As indicated earlier, the primary purpose of the survey was to derive information about the bait leech (*Nepheleopsis obscura*) and its use. The information derived has been published in three technical reports, which can be obtained from the NRRRI at UMD (4, 5, 6).

Of the 5,000 surveys mailed out, 1,722 were returned, giving an overall response rate of 34.4 percent. Surveys were sent to 3,546 residents and 1,454 nonresidents. The resident response rate was 31.4 percent (1,115 responses) and the nonresident response rate was 41.8 percent (607 responses).

## Results and Discussion

The typical Minnesota angler is a male. The respondents to our survey were asked to identify their own sex as well as the sex of other members of their family who fish. Our 1,722 respondents identified 3,392 of their family members who fish. Of these 5,114 anglers, 3,044, or about 60 percent, were males and 2,070 were females (40 percent). The breakdown was exactly the same for both residents and nonresidents.

The typical Minnesota angler is middle-aged. Based on our survey results, the average age for male Minnesota resident anglers is 39.5 years, while for female Minnesota resident anglers it is 36.5 years. The same information for nonresident Minnesota anglers is 48.2 years for males and 43.3 years for

females. The range of responses for angler's age ranged from the low teens into the mid-eighties. This range of responses is somewhat surprising since anglers below the age of 16 and over the age of 65 are not required to purchase Minnesota fishing licenses, yet it was only license holders who were sent questionnaires. The obvious implication is that some Minnesota anglers who are not required to purchase fishing licenses continue to do so anyway.

The annual household income for the typical Minnesota angler is about \$30,600. The range of household income reported was quite large. One and a half percent of the respondents who replied to this question reported household income of less than \$5,000, while more than 15 percent reported household income of more than \$50,000. More than 26 percent of the respondents who replied to this question had household incomes between \$20,000 and \$30,000. The median household income of respondents to our survey (\$33,754) is one third more than the 1983 median household income for the State of Minnesota (\$24,714) as determined by the Minnesota State Demographer (7).

The typical Minnesota angler is well-seasoned, having fished for an average of 26.8 years according to our survey results. When asked what factors were important to their enjoyment of fishing, more than 93 percent of our respondents identified the relaxation received from fishing. Enjoying nature is another important factor, indicated by 86 percent of our respondents. More than 68 percent of the respondents enjoyed catching fish for sport, while more than 59 percent enjoyed catching fish for food. More than 48 percent of our respondents enjoyed fishing because it allowed them to get out in a boat, while about 45 percent enjoyed the natural challenge of fishing. Almost 42 percent of the respondents enjoyed fishing for the solitude involved, while 39 percent enjoyed the socializing while fishing. Finally, using proper fishing technique contributed to the enjoyment of fishing for almost 22 percent of our respondents, while more than 10 percent of the respondents enjoyed fishing because it enabled them to compete with others.

The typical Minnesota angler does the bulk of his fishing in a lake. Only about 6 percent of our respondents did most of their fishing in a river or stream. Fishing from a boat is by far the most common way of fishing for the Minnesota angler. Less than 10 percent of our respondents fished from shore or fished by wading. The typical Minnesota angler normally fished with other family members or with friends. Only about 16 percent of our respondents indicated that they normally fished alone.

The typical Minnesota angler fishes primarily during the summer season, which was somewhat arbitrarily defined to be the period between the fishing season opening and October 1. For example, our survey results show that only 7.3 percent of all walleye fishing occurs outside the summer season. The typical angler fishes about 24 days during the summer season and fishes just a little less than 6 hours per day. Thus, the typical Minnesota angler fished for more than 140 hours during the 1984 summer fishing season.

The walleye is by far the preferred fish species of Minnesota anglers. More than 56 percent of our respondents who indicated a favorite fish species chose the walleye. About one-half of our respondents (48.5 percent) fished most or all of the time for walleyes, and more than 82 percent fished at least some of the time for walleyes. The salmon was the least preferred species of our respondents, with less than one percent (0.3 percent) indicating it was their favorite species. In fact, 91.3 percent of the respondents indicated that they spent none of

their fishing time trying to catch salmon. The rank ordering of the most desired fish species of our respondents is as follows: walleye (56.5 percent), panfish (14.8 percent), bass (11.2 percent), northern pike (8.8 percent), trout (3.2 percent), muskellunge (1.4 percent), and salmon (0.3 percent). About 3.7 percent of our respondents chose some other type of species as their favorite.

The typical Minnesota angler prefers to catch several medium-sized fish of their favorite species in a typical day of fishing. More than 65 percent of our respondents indicated this preference. Slightly more than 18 percent of our respondents would prefer to catch a limit of small but keeper-sized fish of their favorite species in a typical day of fishing. Almost 17 percent of our respondents would prefer to catch one large fish of their favorite species.

The typical Minnesota angler does not own a cabin in Minnesota with water access. This was the case with more than 75 percent of our respondents. Of the 410 respondents who owned a cabin with water access, almost all had access to a lake. Only about 2.9 percent of our respondents owned cabins in Minnesota with water access to a river.

Fishing clubs or organizations are not institutions that the typical Minnesota angler is likely to join. More than 87 percent of our respondents belonged to no such clubs or organizations. The club or organization to which the largest number of our respondents (6.9 percent) belonged was In Fisherman. Of the respondents, 2.7 percent were members of B.A.S.S. (Bass Anglers Sportsman's Society). Other organizations in which some, but very few, respondents were members were Walleyes Unlimited; Muskies, Inc.; Minnesota Sport Fishing Congress; T.R.O.U.T. (Together Reach Out Upgrade Trout); Trout Unlimited; and the Lake Superior Steelhead Association.

The fishing or outdoors magazine that is most likely to be read by the typical Minnesota angler is *Field and Stream*. Almost 31 percent of our respondents read or subscribed to this magazine. However, an almost equal number, nearly 29 percent, indicated they did not read or subscribe to any fishing or outdoor magazines. The rank order of other magazines that our respondents read or subscribed to is as follows: *Fins and Feathers* (25.3 percent), *Outdoor Life* (24.4 percent), *In Fisherman* (19.0 percent), *Sports Afield* (18.6 percent), *Fishing Facts* (11.6 percent), *Minnesota Sportsman* (11.1 percent), *Sports and Recreation* (8.4 percent), and *Jim Peterson's Outdoor News* (6.1 percent). Also, 6.6 percent of our respondents read or subscribed to magazines other than those listed above.

Fishing and outdoor magazines presumably are read because they are a source of useful information about fishing. This was confirmed by our survey results. More than 43 percent of our respondents reported magazines as the second most useful source of fishing information available to them. The single most important source of useful fishing information, mentioned by almost 69 percent of our respondents, was friends. A third of our respondents listed television and radio shows as a useful source of fishing information. Less than 20 percent of our respondents listed sport shows and newspapers as useful sources of fishing information, and less than 10 percent listed books.

The typical Minnesota angler is a member of a household which has \$717 invested in fishing equipment excluding boat(s) and gasoline motor(s). The range of responses to the question of how much the household had invested in fishing equipment was again quite large. The survey showed 12.1 percent of the respondents indicated they had less than \$100 invested in fishing equipment other than boat(s) and gasoline motor(s), while slightly more than 6 percent had invested

more than \$3,000 in equipment. The amount spent by the household of the typical Minnesota angler for fishing equipment other than boat(s), gasoline motor(s), and bait in 1984 was \$165.

A considerable portion of the overall investment in fishing gear was accounted for by fishing rods and reels. The typical Minnesota angler has access to 5.4 reels and 4.8 rods. The breakdown of the 5.4 reels owned by members of the household of the average respondent is 1.9 spinning reels, 1.6 spincast reels, 1.4 casting reels, and 0.5 flyreels. In addition, 1.7 spinning rods, 1.4 spincast rods, 1.3 casting rods, and 0.4 flyrods were owned by members of the household of our average respondent.

A wide variety of fishing equipment other than rods and reels are used by the typical Minnesota angler when fishing. The most widely used additional piece of fishing equipment is the depth finder, which was used by 57.5 percent of our respondents and owned by households of about 45 percent. Of those respondents who own depth finders, 82.8 percent own flasher types, 14.5 percent own graph types, 6.7 percent own liquid crystal display (LCD) types, and 2.8 percent own video types. This list totals more than 100 percent because some respondents own more than one type of depth finder. The typical Minnesota angler considers the depth finder to be a useful piece of equipment, since more than 92 percent of our respondents whose households own depth finders stated that they consider depth finders to be somewhat or very helpful to them. Only about 7 percent considered depth finders to be not very helpful or not helpful at all.

A considerable amount of equipment besides rods, reels, and depth finders is also used by the typical Minnesota angler. About 42 percent of our respondents are members of households that use depth maps or contour maps of lakes. Electric trolling motors are used by more than 36 percent of our respondents, while more than 26 percent use marker buoys. Almost 16 percent of our respondents use liquid bait scents. Equipment that is used by less than 10 percent of our respondents include solunar tables, water temperature gauges, down riggers, trolling boards, out riggers, and pH meters.

Given the range and diversity of equipment used as well as the length of time fished by the typical Minnesota angler, one would expect a variety of fishing techniques beyond still fishing, casting, and trolling to be used as well. This expectation was confirmed by our survey results. Almost 52 percent of our respondents are members of households that use back trolling as a special fishing technique. Structure fishing is used as a special technique by almost one-half of our respondents, while one-third use spoon plugging. More than 21 percent of our respondents use speed trolling as a special fishing technique.

The household of the typical Minnesota angler owns a boat with an aluminum hull that is between 15 and 16 feet in length. More than 58 percent of our respondents indicated that their household owned a boat. For the 978 respondents who own boats, the average length of their primary fishing boat was 15.3 feet. More than 73 percent of our respondents own boats with aluminum hulls, more than 23 percent have boats with fiberglass hulls, and between 1 and 2 percent have boats with wooden hulls. Slightly more than 2 percent of our respondents own boats with hull types other than aluminum, fiberglass, or wood. The average age of the boats owned was 11 years (manufacturing date of 1974), although the boat of the household of the average respondent was purchased in 1977.

The household of the typical Minnesota angler also owns a gasoline-powered motor. More than 66 percent of our respondents indicated that their household owned such a motor. For the vast majority of these people, the type of motor is likely to be an outboard. More than 94 percent of our motor owner respondents stated this was the case. Slightly more than 3 percent of such respondents indicated they owned an inboard motor, while slightly less than 3 percent indicated they owned an inboard outboard motor. The average size of the motor owned by such respondents is 37 h.p., and the average age is 11 years (manufacturing date of 1974). More than 63 percent of the households of our respondents who owned gasoline powered motors stated they owned only one such motor, but more than 36 percent owned a second such motor as well. Virtually all of the second motors owned were outboard motors (more than 99 percent). On average, the second motors owned were smaller (8.6 h.p.) and older (manufacturing date of 1971) than the first or primary motor owned.

The household of the typical Minnesota angler has an investment in boats, motors, and trailers used for fishing equal to about \$2,400. The range of responses to the question of how much the household had invested in boats, motors, and trailers was again quite large. About 12.8 percent of our respondents indicated they had less than \$500 invested in this gear, while 2.1 percent had invested more than \$10,000 and 0.6 percent had invested more than \$20,000.

The 1984 Minnesota fishing experience was rated as average or better by the typical Minnesota angler; 67.6 percent of our respondents indicated this was the case. Our survey results also indicated that 31.4 percent of our respondents rated their 1984 fishing experience as above average or better, 35.2 percent rated it as average, and 32.2 percent rated it as below average or worse. Almost twice as many respondents indicated that their 1984 fishing experience was excellent (6.3 percent) than indicated it was terrible (3.6 percent). Only slightly more than 10 percent of our respondents indicated that their 1984 fishing experience was poor to terrible, while almost 19 percent indicated it was very good to excellent.

In summary, based on the responses to our survey, the typical Minnesota angler:

- is a male
- is middle aged
- has a relatively high household income
- is a well-seasoned angler (i.e., has fished for many years)
- fishes from a boat on a lake with other family members for relaxation
- fishes about six hours in each day spent fishing
- fishes about 24 days per year
- fishes mainly for walleyes
- prefers to catch several medium-sized fish per day trip as opposed to a limit of small fish or one large fish
- does not own a cabin

- does not belong to fishing clubs or organizations
- is most likely to read *Field and Stream* magazine
- receives most fishing information from friends
- is a member of a household that has \$717 invested in fishing equipment excluding boat(s) and gasoline motor(s) and that spends \$165 per year on such equipment
- has access to 5.4 fishing reels and 4.8 fishing rods
- is likely to use a depth finder when fishing
- uses a variety of different fishing techniques
- is a member of a household that owns an aluminum-hulled boat between 15 and 16 feet long and owns a gasoline-powered outboard motor
- is a member of a household that has \$2,407 invested in boat(s), motor(s), and trailer(s)
- rated the 1984 Minnesota fishing experience as average or better

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