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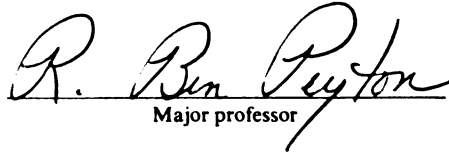
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The Influence of Familial, Social and Environmental
Factors and Implications For Education Intervention
Strategies To Develop Aquatic Stewardship
presented by

Shari Lea Dann

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of the requirements for

Doctor of Philosophy degree in Fisheries and Wildlife


Major professor

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**YOUTH RECRUITMENT INTO FISHING:
THE INFLUENCE OF FAMILIAL, SOCIAL AND ENVIRONMENTAL FACTORS AND
IMPLICATIONS FOR EDUCATION INTERVENTION STRATEGIES TO DEVELOP AQUATIC
STEWARDSHIP**

Volume I

By

Shari Lea Dann

A DISSERTATION

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ABSTRACT

YOUTH RECRUITMENT INTO FISHING: THE INFLUENCE OF FAMILIAL, SOCIAL AND ENVIRONMENTAL FACTORS AND IMPLICATIONS FOR EDUCATION INTERVENTION STRATEGIES TO DEVELOP AQUATIC STEWARDSHIP

By

Shari Lea Dann

Although angler numbers in the U.S. have remained stable in recent years, fisheries management agencies are concerned about the potential for future declines in fishing participation, license revenues, and constituency support for resource management. This study was designed to identify experiences which influence individuals to develop long-term fishing involvement.

This study was conducted in four phases: focus groups, pilot survey, full mail survey, and non-respondent telephone follow-up survey. The sample for the full mail survey consisted of 2966 Michigan resident anglers and resulted in an adjusted response rate of 58.8%. A consumer socialization model of fishing recruitment was used to describe antecedent variables (e.g., sex of youth, age at fishing recruitment) and socialization agents and processes (i.e. influences of family and peers). Fishing involvement was operationalized on the basis of 1991-92 fishing frequency and attitudinal commitment to fishing. A path model describing familial socialization into fishing was tested.

Data from this study supported the hypothesized path model. Teen involvement in fishing was the best direct predictor of long-term fishing involvement. Childhood fishing involvement was related indirectly to current fishing by influencing teen fishing involvement. Childhood and teen fishing involvement were related to the presence of family fishing socialization agents. In particular, high angling involvement was associated with youth who had fathers who fished frequently and high proportions of extended family members who fished. Childhood and long-term fishing involvement were also predicted by very early fishing initiation (prior to age 5). Age of first fishing experience was substantially lower for males

and for those with family fishing backgrounds than for those without such backgrounds. Sex was directly related to childhood, teen and long-term fishing involvement, with males more involved at each life stage.

There were no differences among anglers from rural vs. urban areas or among anglers from different family types (single-parent vs. "traditional") in current fishing involvement. In teen years, however, lower proportions of anglers who grew up in rural-farm and urban areas (vs. rural nonfarm or small town areas) reported fishing frequently. Fishing involvement appears to be related to some environmental stewardship behaviors.

Several implications for agency programs were suggested by study findings. Results support targeting teens, urban audiences, females and young families for programs which enhance youth recruitment into fishing and lifetime angling involvement.

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CHAPTER 1

INTRODUCTION

The Problem of Fishing Recruitment and Long-term Involvement

Fisheries management agencies and fishing industries throughout the country are concerned about the potential for declines in fishing participation and decreasing license revenues available for management (Duda and McElveen 1991). These declines are not the only concerns of fisheries agencies. Even more importantly, as proportionately fewer people are introduced to fishing and the stewardship ethics developed through fishing experiences, constituency support for fisheries and environmental management may erode. There is reason to suspect that the loss of utilitarian users of the resource will cause agencies to face losses of historically supportive constituencies with strong conservation and environmental attitudes.

A recent survey found that administrators of state fisheries agencies perceive several factors may contribute to reductions in license sales. These factors include changing demographics (increasing urbanization, aging population, fewer youth due to smaller family size, and lack of interest in urban populations), competition from other recreation opportunities, family changes (increase in single parent families and families with two working parents, changes in family values), economic reasons, habitat degradation, loss of access, and agency operations (e.g., increasing regulations and restrictions) (IAFWA 1992).

The need to sustain angler participation in spite of changing demographics (such as changes in American families) is causing agencies to investigate factors which constrain or enhance fishing activity (SFI 1990b). Yet agencies are now faced with limited budgets and the need to demonstrate increased accountability for programs. Today more than ever,

resource managers need to better understand the relationships between early fishing recruitment, long-term fishing involvement, aquatic stewardship behaviors of anglers, and anglers' commitment to the broader environmental quality mission of fisheries agencies. A weakening of constituency support for fisheries programs may be avoided if resource managers can better understand the dynamics of fishing recruitment and participation.

Sport Fishing Trends of Concern to Fisheries Agencies

Sport fishing trends are at the root of the concerns of agency administrators and sport fishing industry leaders. The longest, most consistent view of participation is provided by the National Survey of Fishing Hunting and Wildlife-Associated Recreation, conducted every five years by the U.S. Department of Interior, U.S. Fish and Wildlife Service. These data show that numbers of anglers increased more than two-fold from 1955 to 1980 (Manfredo 1986). This increase may have been due to the minimal investment required to participate, the family nature of fishing, the construction of reservoirs in the 1960s and 1970s, improved water quality, and the development of urban fishing programs (Snepenger and Ditton 1985). Although numbers of anglers increased over these decades, when these participants are measured as a percent of population, participation did not keep pace with population growth (Charbonneau and Lyons 1980). Bevins and Wilcox (1980) noted static angler numbers between 1959 and 1978 after analyzing 22 nationwide surveys on fishing participation and equipment sales.

The general increase in fishing during the 1970s was followed by a slower rate of growth and overall stability in numbers of anglers in the 1980s (Kelly 1987). More specifically, one set of studies showed a major drop in fishing participation from 1976 to 1983 and predicted overall stability in the 80s (Kelly 1987). Fishing license sales in the U.S. peaked in 1986 and have remained at about 30.3 million (SFI 1991). Total license holders as a percentage of the U.S. population decreased from a peak of 12.5% to 12.2% today (SFI 1991).

Recreation forecasters have used trend data to predict future fishing participation. Walsh et al. (1989) developed a model utilizing data from the 1980 and 1985 National Surveys. These data were combined with explanatory variables of population, income, costs of recreational participation, age, urban residence, marital status, household size, and resource availability to predict future participation rates in fishing. The results supported predictions that, in the future, growth rates in fishing participation will decrease. Specifically, the 1950-1980 national annual growth rate for freshwater fishing was 2.8% compared to the future predicted growth rate of 1.4% for coldwater fishing and 0.9% for warmwater fishing (Walsh et al. 1989). In another forecasting model, McConnell (1986) used data from the 1980 National Survey to make predictions on fishing participation in several states. The variables of age, income, employment, urban residence, past fishing participation, and supply of fishing opportunities were included in the model. The fishing participation rate for Michigan was expected to decrease from 13.96% of the population in 1980 to 13.88% of the population in the year 2000, although the number of anglers was expected to rise slightly (McConnell 1986).

Actual fishing participation trends in Michigan appear to follow the national patterns. A recent draft report notes that fishing participation increased only slightly in Michigan during the 1980s (MDNR 1991). The number of Michigan fishing license holders peaked at 1.64 million persons in 1987 and has remained relatively constant over the last 5 years (Mahoney et al. 1991). The only declines in license sales in the 1980s were in trout and salmon stamps (MDNR 1991). Real fishing trends (e.g., any declines in participation), however, may be masked by changes in license structures and fees during the 1980s. Some of these changes required more already-active anglers to purchase licenses. For example, 1985 was the first license year in which the spouses of Michigan anglers could no longer fish for free. Changes were also made in activities covered under the sportsperson's license. Thus, some of the increase in license sales in the 1980s may be due to larger numbers of already-active adult female anglers needing to purchase licenses.

Sociodemographic Trends Which May Influence Fishing Participation

Possible Reasons For Changes in Fishing Participation Levels

There is considerable discussion as to the effect of sociodemographic trends on recreational participation (Cook 1989). Four trends affecting fishing participation are decreasing rates of population growth, an aging population, increasing minority populations, and changes in household composition (Murdock et al. 1992). Analysis of factors affecting fishing license sales in states showed that license price increases are related to declines in participation (SFI 1991). Factors such as increasing urbanization and a decline in fishing participation among those of lower education levels may contribute to a long-term decline in fishing participation in the U.S. (Kelly 1987). Other demographic trends expected to affect recreation include increasing economic constraints facing Americans, decline of the middle class, lower living standards, increasing national budget deficits, increasing health costs (particularly for the elderly), and increases in numbers of women living in poverty (Godbey 1986).

In general, Murdock et al. (1992) predict that major national demographic trends will lead to slower growth in angler populations than in the past (i.e. a growth rate of less than 0.5% per year), an older population of anglers, and a larger proportion of anglers of minority status. In addition, many anglers will have fewer economic resources available and may not be able to participate at all (Murdock et al. 1992). One marketing study sponsored by fishing equipment manufacturers concluded cited two possible sets of reasons why fishing is declining: 1) there are fewer people available to go fishing, due to overall demographic trends; and 2) there are significant declines occurring in participation by current and previous anglers (i.e. more than 50% of current anglers previously fished more often) (Harrington Market Research and AFTMA, 1990).

Suspected reasons for the recent leveling off of fishing participation in Michigan may include: reduced population growth, changes in population age structure, low catch rates of fishes (e.g., Great Lakes salmon), and public concern regarding contaminants in fishes

(Mahoney et al. 1991). Unless significant changes occur in quantity and/or quality of fishing opportunities, or unless significant efforts are made to understand and improve fishing recruitment, participation rates are expected to remain static throughout the 1990s (Mahoney et al. 1991).

Changes In Population Growth Rates

The growth of the U.S. population until the year 2000 is expected to be slower than at any time since the 1930s, thus affecting the pool of potential recreational recruits (Cook 1989). Likewise, Michigan's population is expected to grow at only a modest rate until the year 2010 (Rosen 1985). Reduced rates of population growth due to declines in birth rates and declining numbers of women of childbearing age, will be important influences on angler numbers in the future (Murdock et al. 1992).

Reduction in birth rates is one cause for a decrease in the average household size in the U.S.. Average household size decreased 4.5 individuals in 1910 to 2.7 individuals; household size is likely to decline even more in the future (Godbey 1986). Mean household size has declined in Michigan from 3.27 individuals in 1970 to only 2.66 people per household in 1990 (MDNR 1985; MDNR 1991). Some of this decrease may be due to the substantial increase in the proportion of nonfamily households to about 23% of all U.S. households (Godbey 1986). These nonfamily households are composed of people not yet married, people between marriages, and the elderly (Godbey 1986). By 1995, nonfamily households may constitute 30% of all households (Godbey 1986).

Changes in Population Age Structure

One widely discussed trend is the changing age structure of the U.S. population and possible influences on recreation trends. As the sizes of certain age cohorts fluctuate, average education and income levels change; as the "graying of America" and other such age-related demographic changes occur, so do the recreational patterns of American change

(Kelly 1987). Cohort analysis focuses on age groups born in a certain time period and moving through life experiencing the "same historical events of the same ages, and entering each new life course period together" (Kelly 1987:10). Recreation analysts are using age cohort characteristics to predict future demand for recreation (Cook 1989).

In general, Americans consist of three main age cohorts or generational groups with different life experiences and values (Godbey 1986). Depression era children (individuals over age 65) were raised in rural areas. Baby Bust individuals (in their 20s and 30s) are centered in cities and small towns. Baby Boomers (in their 40s and 50s) saw the rise of suburbs and the middle class and were more socialized into outdoor recreation than Depression era individuals (Godbey 1986).

Currently, nearly every age cohort except the Baby Boomers born in the 1950s is smaller than the one preceding it. This Baby Boom cohort represents a population bulge; in the 1990s, the oldest Baby Boomers will reach pre-retirement age, with children launched and maximum discretionary income available (Kelly 1987). From 1986 to the year 2000, as the Baby Bust cohort reaches adulthood, the number of young adults in the U.S. ages 25-34 will decline by 15%, and the number of college age (18-24) adults will decrease by 20% (Cook 1989). It is these declines in age groups reaching angling license ages which concern fisheries management agencies and retailers.

Michigan's population of youth under age 15 will continue to decline through the year 2010; this change reflects the record low fertility rate in Michigan during the mid- to late-1970s (Rosen 1985). Young adults between ages 15-24 will decline by nearly one-half million by 2000 (Rosen 1985). Furthermore, as the Baby Boomers born between 1950 and 1965 age, this will change the character of Michigan's population at every milestone it reaches (Rosen 1985). Adults between the ages of 25-44 will grow from 2.5 million in 1980 to 3 million by 2000, then decline in numbers by the year 2010 as the Baby Bust cohort ages (Rosen 1985). Meanwhile, Michigan's population between the ages of 45-64 is expected to increase more than 50% between 1980 and 2010 (Rosen 1985). A brief baby boomlet will

occur in Michigan during the 1990s. The number of children will then drop off again, due to a reduction in the number of potential parents in the Baby Bust generation (Rosen 1985).

Many of these age-structure changes in the Michigan population Rosen projected based on 1980 U.S. Census data are already occurring (Table 1-1). Michigan's median age has increased from 28.8 years in 1980 to 32.6 years in 1990 (Flesher 1992). While the state's population held nearly constant over the last decade, the numbers of youth have declined. The total population of youth ages 18 and under has declined 11%, and youths between the ages of 10 and 18 declined nearly 21% (Michigan League for Human Services 1992). In the last decade, the number of state residents aged 18-20 fell 21.4%, and 21-24-year-olds decreased 28.3% (Flesher 1992). These age groups represent the Baby Bust cohort following the Baby Boomers through the population. The main group of Baby Boomers, those age 25-44, increased 17.1% in the last 10 years (Flesher 1992). Senior citizens are also much more numerous.

Understanding changing population age structures is important for management because each age cohort differs from others in size, each cohort has its own "personality" with differences in the fishing experiences they prefer, and angling participation rates differ

Table 1-1. Age distribution of Michigan residents, 1970 to 1990. (Sources: MDNR 1985; MDNR 1991.)

AGE	1970 #	1980 #	1990 #	% change 1970-80	% change 1980-90
Under 5	804,463	685,113	702,554	-14.84	2.55
5-17	2,446,907	2,066,873	1,756,211	-15.53	-15.03
18-24	1,031,542	1,257,828	1,004,527	21.94	-20.14
25-44	2,084,685	2,544,286	2,980,702	22.05	17.15
45-54	1,007,008	930,931	948,119	-7.55	1.85
55-64	747,523	864,789	794,723	15.69	-8.10
65+	752,955	912,258	1,108,461	21.16	21.51

among age cohorts of anglers (Ryder 1965, Loomis and Ditton 1988). A benefit of understanding age cohort differences in participation is that managers can assess the potential for differential responses of cohorts to fisheries management changes (Loomis and Ditton 1988). From 1982 to 1985, fishing participation rose 9% among those in the 35-44 year old age group (Kelly 1987). Kelly concluded that the Baby Boomer cohort is now the group most likely to fish, and the 18-24 year olds show the greatest reduction in participation (1987). Fishing participation dropped 15% in the 18-24-year-old age cohort between 1982 and 1985 (Kelly 1987). In an alarming parallel, Kelly noted that hunting participation among young males is dropping, and

"as the cohort moves through the life course, they are not likely to increase their hunting rates. Further, when they are the teaching and nurturing generation, they will compound the loss as they are less likely to introduce their children to this activity (Kelly 1987:64)."

Among adult anglers who fish, only 20% have a child who also fishes; some believe this constitutes "a break in the teacher-student chain of learning, the fishing industry's link to its own future" (SCOT Wildlife News 1991).

In 1980 and 1985, about one-third of Michigan youth ages 6-15 went fishing (U.S. Fish and Wildl. Serv. 1982 and 1989). The rate of fishing participation of young adults, however, decreased between 1975 to 1985. In 1975, over half (51%) of adults aged 25-34 were anglers, whereas in 1985, only 38% of adults that age went fishing (U.S. Fish and Wildl. Serv. 1982 and 1989). Adults age 25-34 in 1985 did, however, constitute the single largest age group of Michigan anglers, representing 29% (or nearly one-third) of all anglers. If fishing participation rates (expressed as a percentage of total population going fishing) are dropping for this Baby Boomer age cohort, we can only guess at the combined effects of the movement of smaller cohorts (i.e. the Baby Bust cohort) through our population and the decreasing levels of participation of succeeding cohorts and generations. For example, even if we assume a constant participation rate (of 35% of youth ages 6-15 participating in fishing) over time, with the smaller size of this age group projected in the year 2010, we would have

only approximately 494,800 youth anglers that year, as compared with 532,600 youth anglers in 1985. This represents a 7.1% decline in total numbers of youth anglers over this time period. This decline could conceivably be much greater, if proportionately fewer parents introduce young people to fishing in the future.

Another reason for understanding the influence of population age structure on fishing participation is the significant relationship between the childhood initiation of a recreational activity and continued participation in that activity as an adult (Sofranko and Nolan 1972, Yoesting and Burkhead 1973, McGuire et al. 1987, Penaloza 1987). The majority of today's anglers began fishing during their childhood when the family unit exerted a major influence on their activities (Home Testing Institute 1985, U.S. Fish and Wildl. Serv. 1987, SFI 1990a and 1990b). Over 73% of adult respondents to the 1980 National Survey stated they had started fishing before the age of 12 (U.S. Fish and Wildl. Serv. 1982). Another report cites that 57% of U.S. anglers began fishing before age 10 (Harrington Market Research and AFTMA 1990). About one-fourth of all anglers began fishing before 6 years old, and the average age of beginning anglers was 9.8 years old (Sporting Goods Business 1990). Another national study noted that nearly 90% of all freshwater anglers started fishing before they were age 20, while only 7% began fishing in their 20s and 4% began at age 30 or older (Harrington Market Research and AFTMA 1990). The 1985 National Survey of Fishing, Hunting and Wildlife-Associated Recreation found that the majority (52%) of all first time anglers in the U.S. were age 17 or younger; 38% of first-time anglers that year were age 11 or younger (U.S. Fish and Wildl. Serv. 1987).

The 1980 National Survey found that 62.8% of anglers in Michigan had begun fishing before age 18 (U.S. Fish and Wildl. Serv. 1982). In that year, 47.3% had begun fishing before age 12; nearly one-third had begun before age 9. In other studies of Michigan youth, high proportions expressed interest in or previous participation in fishing. Over 88% of 1st-3rd graders and 93% of 6th-8th graders reported that they had gone fishing at some time (Wong-Leonard 1992). These were higher proportions of involvement than in any other

activity including camping, watching wildlife, or joining wildlife-related clubs (Wong-Leonard 1992). Of Michigan early adolescents aged 10 to 14, 74% of boys and 49% of girls reported fishing as a preferred activity; fishing was a preferred activity of 84% of 14-18-year-old boys (Keith et al. 1985 and 1992).

Studies show that the earlier people take up fishing, the more involved they become with the activity. Of those very active anglers (who fished more than 52 days in one year), 40% reported they had started fishing before age 6, whereas of infrequent anglers (fishing 1-11 days per year), only 24% reported an early start before age 6 (Sporting Goods Business 1990). In another study, 18% of very frequent anglers (who fished over 40 days per year) had begun fishing before age 5; two-thirds of these active anglers had begun before age 10 (Harrington Market Research and AFTMA 1990). Significantly more anglers who rated themselves as "highly skilled" reported starting early (37%), vs. only 22% of "less skilled" anglers had an early start (Sporting Goods Business 1990). These market analysts concluded that their findings constitute a clear mandate for special efforts to recruit young children into fishing. Promotions directed at young anglers may have greater returns on investment than promotions aimed at any other age group (Harrington Market Research and AFTMA 1990). They also suggested a grassroots approach to encourage women to start fishing and to take their children fishing (Sporting Goods Business 1990). In addition, keeping the older Baby Boomers involved and active in fishing (perhaps by pairing older adults and children in programs) will help maintain angler ranks and support sales while the 18-44 age group declines during the 1990s (Harrington Market Research and AFTMA 1990).

Changes in Family Structure

Fisheries agencies and industries are concerned that changes in household composition are affecting recreational recruitment. Family structure in the U.S. has changed drastically over the last 40 years, but has changed most rapidly during the 1970s and 80s. In the U.S., single-parent female-headed households increased 58.5% from 1970 to 1980 (SFI

1990a). By 1987, nearly 24% of children under 18 lived with one parent, double the percentage in single-parent homes in 1970 (Cook 1989). In spite of a recent slowing of the divorce rate in the U.S. (Cook 1989), it is estimated that in the coming decades, at least half of all children will spend some period before they reach age 18 in a single-parent family (Kelly 1987). About 90% of the children from split families reside with their mothers (Nelson 1987), who are probably less likely than fathers to introduce their children to fishing. The stereotypical "traditional" family, composed of two parents with husband as wage earner, wife as homemaker, and two children under age 18 made up only 5% of all families in 1987 (Cook 1989). Only 28% of households today are composed of married couples with children under age 18, whereas this household type constituted 45% of households in 1950 (Cook 1989). Households in the next decades will be characterized by fewer children, and by the breaking and reconstituting of family units with resulting periods of transition for families (Kelly 1987).

Single parent family trends in Michigan are similar to those in the U.S. during the last two decades. Overall, 22.5% of Michigan children live with only one parent, and 11% of all Michigan households (nearly one-fourth of family households) are single-parent households (Michigan League for Human Services 1992). The number of households headed by single mothers in Michigan has increased from 5.7% of family households in 1970 to 12.3% of family households in 1990 (MDNR 1985; MDNR 1991). The traditional, two-parent family with children is a shrinking proportion of all households in Michigan (Figure 1-1); in 1970, traditional, two-parent families represented 47.6% (about half) of all Michigan households, but in 1990 two-parent families with children were only 37.1% (just over one-third) of all households. Lately, however, the rate of increase in single-mother households has slowed, probably due to the slowing of the divorce rates. Between 1980 and 1990, there was a 22.4% increase in the number of households headed by single mothers (Table 1-2) (MDNR 1991).

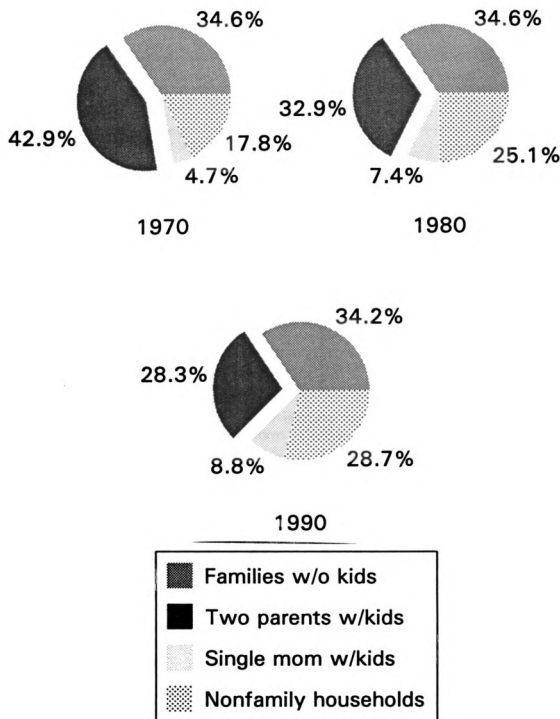


Figure 1-1. Michigan household characteristics, 1970 to 1990. Note: pie slice at left of each pie chart represents the "traditional" two-parent family with children, a decreasing proportion of Michigan's households. (Sources: MDNR 1985; MDNR 1991)

Table 1-2. Single parent family trends in Michigan from 1990 census data. (Sources: MDNR 1985; MDNR 1991.)

Household Type	1980 Households		1990 Households		% Change from 1980-90
	Number	Percent	Number	Percent	
Family Households	2,392,504	74.8%	2,439,171	71.3%	+1.95%
Family with Married Couple*	1,948,015	60.9%	1,883,143	55.1%	-3.33%
Family with Female Householder	361,180	11.3%	422,239	12.9%	+22.44%
Family with Male Householder	83,309	2.6%	113,789	3.3%	+36.59%
Nonfamily Household	802,709	25.1%	980,160	28.7%	+22.11%
Total # Households	3,195,213		3,419,331		+7.01%

*Families with married couple includes both childless couples and couples with children. In 1990, 51% of these households had children. Children were only 37.1% (just over one-third) of all households.

While single parent families increased over the last decades, other changes in household composition were also occurring in Michigan. The number of nonfamily households doubled between 1970 and 1990 (Table 1-2). The reasons for this increase probably include more unmarried partners sharing living quarters and more adults (especially Baby Boomers) living alone.

Of perhaps greater concern is the proportion of Michigan children living in poverty. In 1990, over 54% of Michigan single-parent, female-headed families lived in poverty, while only 7.2% of married couple families were in poverty (Michigan League for Human Services 1992). On the average, single parents have lower education and income levels than persons in two-parent families (U.S. Dept. of Commerce, Bur. of the Census 1989). Almost 25% of a low-

income family's dollars may go toward child care, compared with only 6% of above-poverty family's income; this leaves much fewer financial resources available for recreation (McCormick 1991). All of these trends in household composition and families in poverty have potentially negative implications for leisure and fishing involvement in the present and into the future.

Changes in Urbanization

Other social trends have managers concerned that we can no longer assume the same level of fishing recruitment by young cohorts. In 1800, only 6% of Americans lived in cities (Schiamberg 1988), but today, over 75% of the U.S. population now lives in metropolitan areas (all areas with populations 50,000+ and the surrounding suburban counties) (Cook 1989). National data show that a higher proportion (30%) of rural and small town residents fish, while only 22% of residents of small cities fish, and only 14% of urban (large city) residents fish (U.S. Fish and Wildl. Serv. 1982).

A demographic trend which may be more positive for fishing recruitment is that Michigan's population is moving from metropolitan areas toward non-metropolitan areas. This trend is projected to continue over the next decade (MDNR 1991). The proportion of the Michigan population residing in metropolitan areas decreased slightly from 80.8% in 1980 to 80.1% in 1990. There was a substantial decline over this decade of 9.1% in the number of people living in central city areas. On the other hand, there was about a 4% increase in the population living in non-metropolitan areas (MDNR 1991).

Other Sociodemographic Trends

Families are becoming less "traditional" in other ways. Families are more mobile than in the past; today more than one-third of American adults live outside their state of birth (Associated Press 1993). Children today have less contact with extended family members who may provide child care and socialization similar to that provided by parents (McCormick

1991, Garbarino 1992). About 60% of U.S. children have mothers who are working or looking for work; this proportion is expected to rise to 82% by 1995 (Cook 1989). While this statistic might imply that there are more financial resources available for recreation, the lack of leisure time is a major problem today (Godbey 1986, Kelly 1987, Cook 1989). Child care is a problem for working parents, too. In 1976, only 13% of children age 7-13 whose mothers worked cared for themselves after school; by 1989, 22% of children with working mothers were "latch-key" children (Garbarino 1992). All of these factors may significantly impact fishing recruitment.

Some demographic trends provide more hope for those tracking the potential for fishing recruitment of young people. By the year 2000, numbers of children under age 18 will grow moderately in the U.S., as children born during the Baby Boomlet since 1977 (children of the last Baby Boomers) mature (Cook 1989). The number of family households in the U.S. is also expected to grow by 12% in the next decade (Cook 1989). Recreation researchers predict an increased focus on American children, in part due to the heightened awareness of children among Late Baby Boomers; for example, 82% of Americans say they receive the most satisfaction in life from their children (Cook 1989). Nearly 90% of American agree that it is as important for fathers to spend as much time with children as mothers, giving rise to the so-called "Renaissance father" whose first priority is parenting (Cook 1989). Furthermore, parental guilt over leaving their children while they work is expected to help boost sales of children's products over the next decade. Children are taking on greater household responsibilities and making more and larger purchasing decisions themselves (Cook 1989). Many industries, including travel industries such as hotels, are now adapting products and services to attract this new children's market (Cook 1989).

Research Needs

In summary, the following recent demographic trends are major influences on recreation patterns in Michigan: slowed population growth, movement of people from urban to nonurban areas, the aging of the Michigan population, and changing composition of Michigan's households (MDNR 1991). Research is needed to determine whether large-scale sociodemographic changes may indeed be influencing the recruitment of Michigan youth into fishing. This study will examine possible relationships between antecedent variables (i.e. sex, urban vs. rural residence as a youth, "traditional" vs. single-parent family type while growing up, and age at fishing initiation) and childhood and long-term involvement with fishing. This research may provide managers with greater predictive ability for the age structure and participation rates of fishing populations over time and with options to counter declining fishing participation.

Changes in family ecosystems that may preclude many youngsters from the opportunity to initiate fishing have concerned fisheries administrators perhaps more than any other sociodemographic change. Numerous studies have alluded to the importance of early recruitment to fishing, of family support, and of parental fishing activity in the development of long-term angler involvement (Siemer et al. 1989a, Stout et al. 1990, SFI 1990a, SFI 1990b). The family is the immediate social setting for development of the basic processes of valuing, goal setting, and allocating resources, which all result in the outcomes of socialization and consumption (Andrews et al. 1980). Thus, the family is important as a primary socialization system for fish and wildlife recreation. Family support of participation has been shown to be important to beginning hunters (Brown et al. 1987, Decker and Mattfeld 1988, Applegate 1989). More information, however, is needed concerning these early familial, social and environmental influences on the development of fishing involvement in order to design more effective family-based intervention and education strategies.

Much more work is needed to describe the dynamics of early recruitment into fishing. Recruitment into a recreational population is not easy to quantify; an individual may enter and

leave the population repeatedly, and may experience latent periods with no recreational participation. In fact, recreation researchers are just beginning to develop models that take into account multiple facets of recreation involvement which include interest levels, attitudinal commitment (e.g., "loyalty"), and behavioral commitment (Goodale and Witt 1989, McIntyre 1989, Backman 1991). Little is known about how the nature and quality of introductory experiences affect a youth's early and continued fishing involvement. The constraints limiting participation of youth in fishing have not been well-identified. Some individuals who quit fishing dislike contact with fish, cleaning fish, and baiting hooks (Home Testing Institute 1985), however other variables with more direct influence on fishing behavior need better description. More information regarding exposure events early in the lifespan will aid in design of marketing and education programs to increase fishing involvement.

Fisheries agencies are not only involved in meeting angling clientele needs and providing for recreational opportunities, they are also concerned with fostering public understanding of fisheries management and cultivating fisheries and environmental stewardship attitudes in citizens. One antecedent of importance in fostering stewardship (or "responsible environmental behavior") is "environmental sensitivity", an empathetic perspective toward the resource developed usually by outdoor experiences providing direct contact with resources over a period of time (Hungerford and Volk 1990). Often, variables associated with sensitivity are not associated with formal educational programs; individuals report participation in fishing and other recreational activities as important precursors to their sensitivity (Hungerford and Volk 1990). Clearly, angling participation has great potential in promoting stewardship ethics in individuals, and the dynamics between these relationships need better description.

Statement of the Research Problem and Questions

Since no previous comprehensive study of anglers has specifically addressed factors influencing recruitment into fishing during youth, this study intends to investigate relationships between antecedents to fishing involvement, the nature and quality of early fishing socialization experiences, and socialization outcomes (such as attitudinal and behavioral commitment to fishing). These variables need better description over the life course of individuals – from childhood, through adolescence, and into adulthood. A comprehensive model of the dynamics of fishing recruitment and long-term involvement will help agencies better address the problem of static angler numbers due to demographic changes and shifts in societal values away from direct contact with resources.

This study will investigate the following research questions:

- 1) How are antecedent variables (such as sex of youth, urban vs. rural residence as a youth, traditional vs. single-parent family as youth, and age of youth at time of fishing introduction) related to fishing socialization and involvement?
- 2)
 - a) How is the presence of fishing socialization agents (sources of early fishing exposure such as family and peers) related to fishing involvement?
 - b) How do socialization processes (the nature and quality of early fishing experiences) affect teen and current fishing involvement?
- 3) What are the relationships between youth involvement in fishing and the individual's current involvement in fishing?
- 4) How do recreational constraints influence expression of fishing involvement in teens and adults?
- 5) What are the relationships between early fishing socialization, degree of fishing involvement and the frequency of environmental stewardship behaviors?

Potential Implications of This Study

Information regarding sources of early exposure to fishing, and how the nature and type of early exposures influence fishing involvement will better prepare agencies and industries to direct resources toward particular target markets to "cement their relationship with the sport and increase their avidity level" (SFI 1990). Meaningful intervention strategies will be developed to encourage earlier, longer, and repeated exposures to fishing throughout youth and to help them develop into responsible recreationists and stewards of aquatic resources. Means of improving the effectiveness of current Michigan Department of Natural Resources recreational fishing information programs and educational clinics and materials may be suggested by these findings. Findings might help to identify those elements of the early fishing experience which more effectively help individuals develop into lifetime anglers. Clinic location, format, experiences, and support materials may be better designed based on these findings to meet the needs of today's families. In addition, organizational partnerships (i.e. with industry and/or with Big Brothers/Big Sisters and other youth-serving organizations such as 4-H) can be formed to encourage repeated fishing exposures of youth who are "at risk" of not having early fishing exposure.

Youth who have an early, successful introduction into fishing may become adult recreationists who support sound fisheries management and who are active stewards. If this is so, fisheries agencies may be able to better justify their efforts and expenditures in materials and clinics which will introduce youths to fishing and fisheries management. In addition, other organizations offering aquatic education may utilize these findings to incorporate fishing and fisheries experiences into their programs. A better understanding of fishing recruitment will not only assure continued revenues for management, but will also provide increased management options for fisheries agencies for the future by maintaining a viable, active constituency in support of fisheries resources.

CHAPTER 2

LITERATURE REVIEW

Organization of This Chapter

Individuals develop into anglers over time and in the context of social systems. This development is influenced by other developmental phenomena during youth. Participation in fishing is also influenced by constraints and by benefits sought by individuals. Finally, recreational angling has been linked to development of environmental stewardship behaviors. These points have been discussed extensively in the recreation and human development research literature. A comprehensive model of fishing socialization is presented in the following text, then, each component of this socialization model is discussed in a brief review of the literature. Based on the theoretical and empirical literature reviewed, relevant research questions and hypotheses are then listed for each factor in the proposed model of fishing socialization.

Models of Human Development and Fishing Socialization

Youth Development: Definitions and Contexts

Human development is a process of change; this change is cumulative over time and occurs in the context of various environments (Schiarnberg 1988). Three criteria must be met if a change in a person is to be considered a developmental change: the change must be orderly and sequential; the change results in a permanent alteration of behavior; and the change results in more advanced, useful or adaptive behavior on the part of the individual (Schiarnberg 1988). Developmental change is easier to describe for motor skill progress; sequences of physical growth are proven rather easily (Schiarnberg 1988). More difficulty arises in demonstrating orderly sequences of cognitive, emotional or social changes. This

difficulty is due to the great variation among individuals in rates and stages of progress (Schiarnberg 1988).

Development is best viewed as being due to reciprocal and dynamic interactions between the person and his/her environment (Schiarnberg 1988). Bronfenbrenner (1988) describes development by using the following representation:

$$D = f(PE)$$

In this relationship, D represents developmental outcomes, the characteristics of individuals subject to development. Development, then is a function of (f), or the result of joint interaction between, characteristics/properties of the person (P) and his/her environments (E). This definition of development encompasses both behavioral (objective) and phenomenological (subjective) aspects of human functioning; in other words, developmental outcomes are not merely behavioral, but it is necessary that the developmental outcome/change exhibit some continuity across both space and time (Bronfenbrenner 1986a). Use of the term "function" implies a set of processes through which the course and consequences of development are determined (Bronfenbrenner 1988). Developmental outcomes have their origin in environmental conditions, events and processes taking place at an earlier period in the life of the person (Bronfenbrenner 1988).

An ecological model of human development developed by Urie Bronfenbrenner views individuals and environments as mutually shaping systems and emphasizes the active role of the individual within social contexts (Garbarino 1992). The contexts of development, those regularly occurring environmental settings that can affect development by either providing opportunities or risks, can be arranged on a scale from those settings most proximal to the developing individual to those settings which are most distal but no less important. These contexts are shown in Figure 2-1.

The microsystem is the immediate setting where the child develops and includes people and environmental features closest to the child such as parents, home, school, neighborhood, and the events happening in those environments. As the child develops,

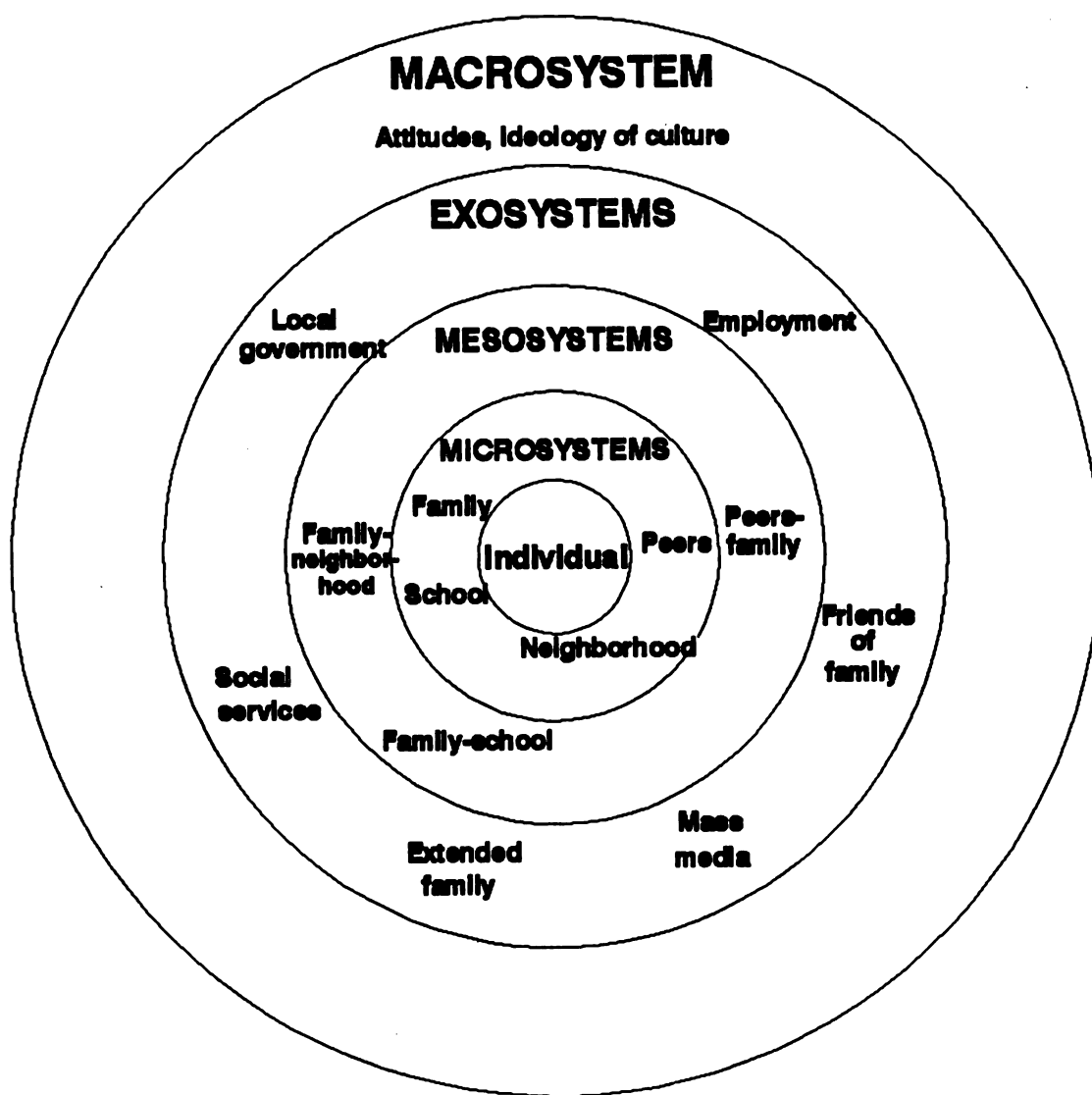


Figure 2-1. The ecology of human development originally described by Bronfenbrenner (based on Lerner et al. 1989:19, Garbarino 1992:29, and Schiamberg 1988:58).

he/she becomes less dependent on his/her immediate family, he/she moves into new microsystem environments (such as school), and the complexity of his/her microsystem increases. Through the family of origin, individuals fulfill their needs for identity, relatedness, intimacy and growth (Garbarino 1992). Over time, peers and other influences become increasingly important to the developing individual. These immediate settings may have the greatest impact on a child's early recreational choices and opportunities.

The mesosystem is established whenever the child enters a new setting (a process called an "ecological transition"); the mesosystem consists of the relationships between two microsystems of which the child is a member (Figure 2-2). For example, the interaction between family network and the school network is considered a mesosystem. The stronger and more complementary the interactions within the mesosystem, the more beneficial that mesosystem will be for the individual's development. Mesosystems may influence recreational choice and opportunities; if two networks (such as family and school) are complementary in their views of consumptive recreation such as fishing, the individual's participation may be reinforced.

The exosystem consists of community-level factors influencing a child's development; the child does not have usually have direct interaction with these factors. Examples of exosystems indirectly influencing families and children include the parents' work place, school boards, and other community decisionmakers. Demands placed on parents and on the institutions which in turn influence children will ultimately impact the types of recreational opportunities available to families.

The macrosystem is the system of broad ideological and institutional patterns of a particular society and culture; in essence, the macrosystems consist of the "blueprints" of society (Garbarino 1992). These macrosystems can influence the ability of adults in society to provide opportunities that support youth development. Increasing urbanization, changing sex roles, fluctuating economic conditions, and attitudes toward leisure and toward particular recreation activities (such as fishing) all constitute examples of the fabric of macrosystems.

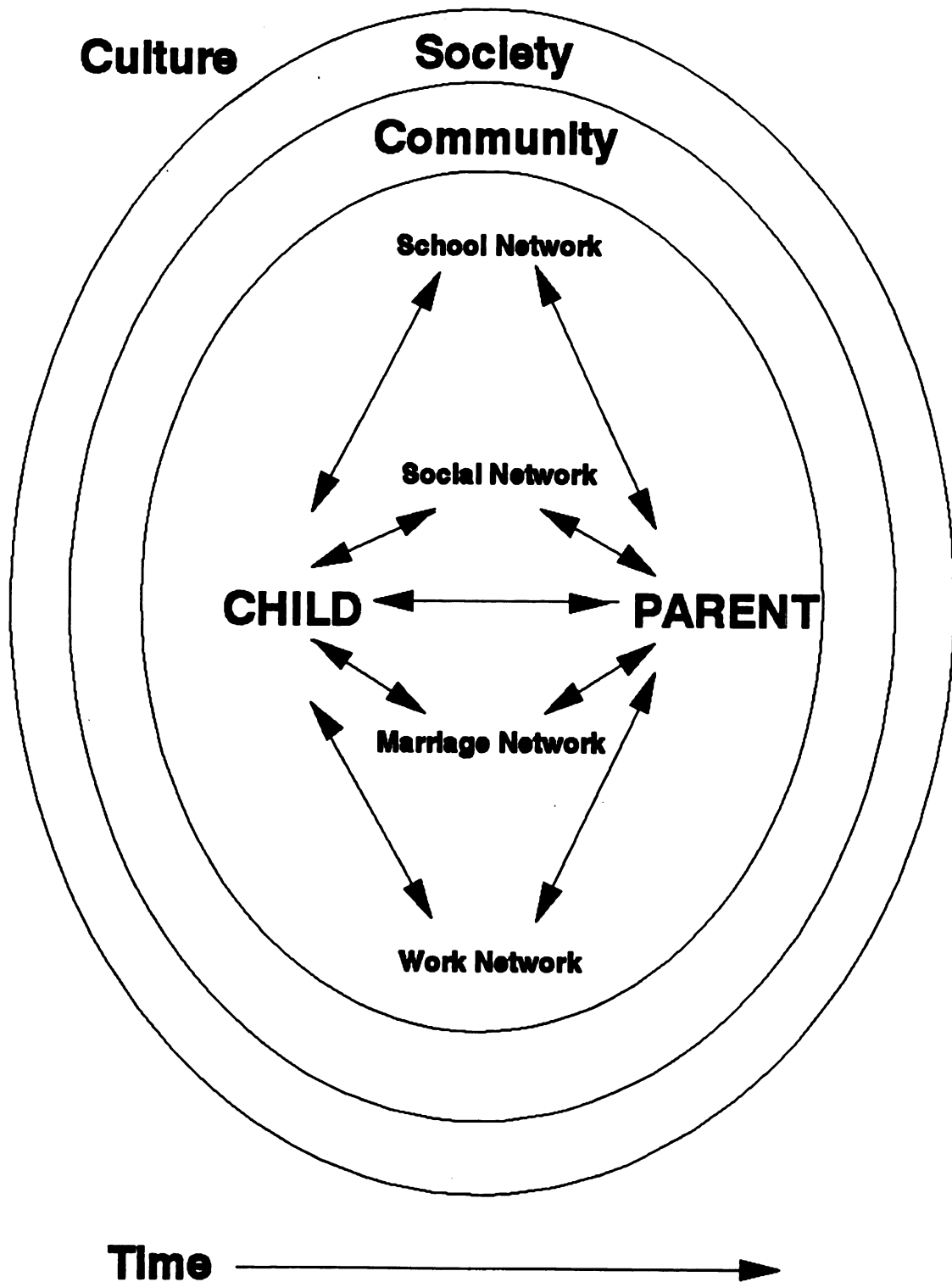


Figure 2-2. Mesosystem level interactions of networks, according to a developmental contextual model by Lerner et al. 1989:19.

In summary, development is the process of increasing differentiation, increasing complexity of organization, or refinement of functioning in a selected domain (such as physical, cognitive, or social domains). Furthermore, development occurs through and in the context of social relationships (Garbarino 1992: 101).

An Overview of Fishing Socialization

The process of fishing recruitment, by and large, is a social process; most persons are recruited into fishing at a very early age while under the influence of significant others including family and childhood peers. Yet, no comprehensive model describing social influences on fishing recruitment has been developed. A review of the literature describing recreational socialization can provide valuable insight into the factors which may affect fishing recruitment and continued participation.

In general, researchers agree that leisure socialization is a lifetime process (Kelly 1974, Yoesting and Christensen 1978). Implications of this notion are that youth should be introduced early to lifetime recreational opportunities in which they may desire to participate as adults, rather than to team sports which are commonly emphasized in schools and colleges (Yoesting and Christensen 1978).

One model of recreation activity adoption was proposed by Brandenburg et al. (1982). In this conceptual model, prerequisites to adoption include an individual's initial preoccupations and interests in the activity, as well as four conditions necessary for interest in an activity to be expressed. These conditions include opportunity for the activity (access, transport, financial considerations, time, and absence of other constraints), knowledge about the activity (through prior experiences, reading, seeing a demonstration), a favorable social milieu (a reference group such as family or peers with favorable attitudes toward the activity), and the individual's receptiveness for trying the activity. These prerequisites, plus key events relating to the activity itself, contribute to the adoption of the activity (Brandenburg 1982). Key events which precipitate an individual adopting an activity might include someone

personally inviting them to take part, being given a piece of recreational equipment, or being stimulated by an exhibit or other publicity.

More indepth studies of fishing and hunting socialization, specifically, have been conducted at Cornell University. Models of fishing initiation are based on innovation adoption theory, and on behavioral models developed by Fishbein and Ajzen (theory of reasoned action) and Reeder's social action model (Siemer et al. 1989a). In one model, adoption of salmonid fishing in Lake Ontario is assumed to begin with activity awareness, then progresses through stages of interest, trial involvement, early adoption and continued involvement; furthermore, participation in the recreation activity is assumed to be psychologically motivated and socially mediated (Siemer et al. 1989a). Important influences on the individual in his/her decision making process to recreate include family and social/fraternal (affiliative) factors, achievement related motivational factors, and appreciative factors. In addition, situational factors such as supply, access, or physical ability influence whether the activity is adopted (Siemer et al. 1989a). In an exploratory study of salmonid anglers, Siemer et al. (1989a) found that most anglers began fishing with their fathers while 6-8 years old or younger, that their initial trips were to ponds, lakes or streams to fish for panfish, and that angler initiation was influenced by five categories of factors: support from family (and from friends), force/mandatory exposure to fishing by family members or others, behavioral beliefs (developed through experience, media, or stories) that fishing was a rewarding activity, proximity to fishable waters, and opportunity to go fishing with family or friends.

All of these models point to the importance of socialization in determining an individual's participation in recreation. Various definitions of socialization may be employed. Socialization, in its purest form, is the process whereby individuals are initiated into a culture and learn particular aspects of that culture, such as the rules of traditional childhood games or other structured uses of leisure time (Kelly 1974; Kelly 1977). Socialization is "the means by which common patterns of group interaction are developed... and is a reflection of the

group standards relevant to the education of the individual" (Dottavio et al. 1980: 358). Another general definition of socialization is the "process by which individuals acquire knowledge, skills, and dispositions that enable them to participate as more or less effective members of groups and the society" (Moschis 1987: 8). More specifically, recreational socialization includes the processes of acquiring the "skills, experience, relational norms, equipment, attitudes and frequently the taste required for participation" in leisure activities (Kelly 1974). Leisure socialization, then, is the process of learning through past experiences and choices how to be a leisure actor (Kelly 1989).

A key assumption of a socialization approach is that "to understand human behavior, we must specify its social origins and the processes by which it is learned and maintained" (McLeod and O'Keefe 1972: 127-128). The basis for a socialization approach to studying leisure is that a number of factors (such as gender, age, ethnic identification, education level, marital status, residence area, family status, age-indexed abilities and expectations) produce different life histories for recreationists (Kelly 1989). In considering socialization of an individual over his/her life course, there is a continual adjustment between the individual and his/her situations or roles, and that socialization results in changes in the individual's orientation toward his/her environment; this is, in effect, relearning or "resocialization", occurring throughout a person's lifetime (Moschis 1987:13). Opportunities for leisure, role expectations, self-definitions, and leisure contexts all change dramatically throughout the lifetime of individuals (Kelly 1989).

A Generalized Model of Consumer Socialization with Applications for Fishing Participation

Moschis (1987) has developed a comprehensive model of socialization of consumer behavior – those acts preceding, determining and following the act of purchases by the consumer. He defines consumer socialization as "the process by which [one] acquires skills, knowledge and attitudes relevant to their effective functioning as consumers in the marketplace" (Moschis 1987: 9). This perspective represents a framework which integrates

**Social sciences and other disciplines and which allows opportunities for studying how
Consumer behavior is affected by learning throughout the life cycle.**

A consumer socialization approach to describing fishing participation is appropriate in two ways. First, fishing can be considered a social world, complete with its primary activities, sites where activities occur, technology, forms of communication, general rules, and organizations (Ditton et al. 1992). Second, researchers and managers alike are now viewing fishing as a consumer behavior and applying marketing concepts to the segmentation of fishing participants (Kikuchi 1986). In fact, a consumer socialization approach is useful in understanding and addressing certain practical marketing problems and issues, such as targeting specific market segments (Moschis 1987).

Consumer behavior is acquired through the interaction between the person and various socialization agents in specific social settings (e.g., the family) (Moschis 1987: 27). This consumer socialization model is composed of three main elements in a causal sequence: 1) antecedents; 2) socialization processes; and 3) outcomes - both consumer behaviors and attitudes (Figure 2-3).

Antecedents to consumer behavior include two types of variables: a) social/structural variables affecting learning; and b) age or lifecycle position (Figure 2-3). Social structural variables are those aspects of the social environment within which a person's learning occurs; these variables may also act as "constraints" to socialization. Examples of these variables include: sex, class, race, and other subculture variables. Age or lifecycle position refers to the specific time in life when socialization occurs. This is an important variable, because people at different ages or stages in the life cycle are influenced differently by environmental factors.

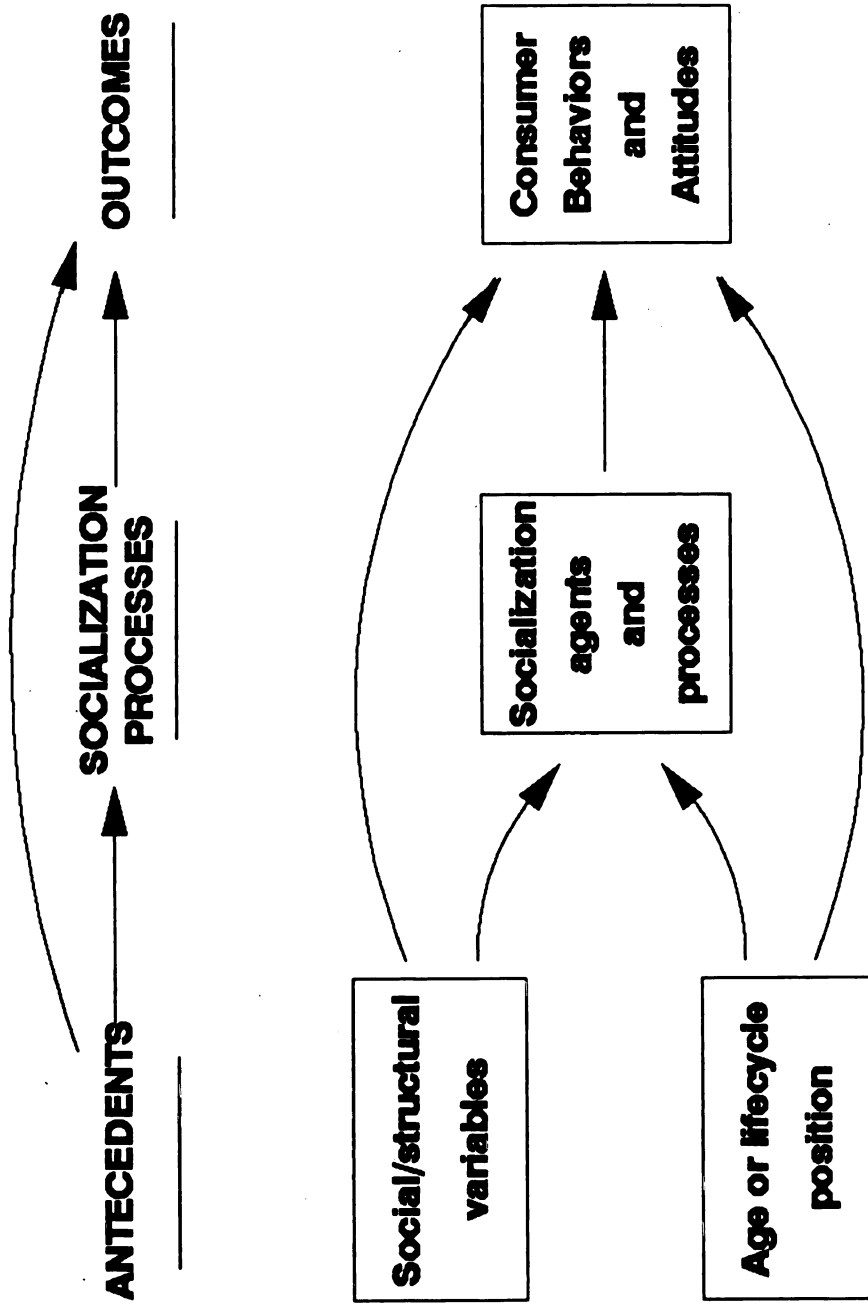


Figure 2-3. A general model of consumer socialization (based on Moschis 1987).

Socialization processes include two types of variables: a) socialization agents (or sources of influence); and b) specific learning/socialization processes (Figure 2-1). "Agents" include the person(s) or organization(s) directly involved in socialization due to frequency of contact with the individual. Learning processes are the ways in which the learner acquires values and behaviors from these agents of socialization. Examples of learning processes are modelling, reinforcement, and social interaction. The process of modelling may also be called imitation learning, vicarious learning, or observational learning (including role-playing and identification); these types of learning are based on Bandura's (1969) social learning theory. Modelling is usually operationalized as the correlation between the agent's behavior and the learner's behavior. Reinforcement processes of socialization involve either positive (reward) or negative (punishment) events. Social interaction as a process is particularly important; in this process, what is learned is due to a series of interpersonal relationships relating to a given social role – this process is usually operationalized as the frequency of interaction with a given agent or set of agents.

Finally, the outcomes of consumer socialization are both behavioral and attitudinal properties acquired by the individual which help that person function within a social system. These variables may be called "learning properties", or "content or criterion behavior".

The relationships among all of these variables in Moschis' model of consumer behavior are illustrated in Figure 2-3. Not shown is another construct called "anticipatory consumer socialization." A person may acquire certain skills or information (for example, early in life) but not use them immediately. In fact, early acquisition of such skills, or "anticipatory socialization", can affect later learning of attitudes, skills and behaviors. Moschis provides the following definition of anticipatory socialization from Hess and Torney (1967: 26): "the acquisition of attitudes and values...that have limited relevance for a child but serve as a basis for subsequent learning." An example of anticipatory socialization is the early development of consumer orientations which influence later spending habits (Moschis

1987). As another researcher states,

"at least some patterns of adult consumer behavior are influenced by childhood and adolescent experiences, and study of these experiences should help us to understand not only consumer behavior among young people, but the development of adult patterns of behavior, as well" (Ward 1974:49).

A Proposed Consumer Socialization Model of Fishing Socialization

A proposed theoretical model to describe antecedents to and processes of fishing socialization is presented in Figure 2-4. This model is based on Moschis' consumer socialization model, and it incorporates elements of other models of the fishing adoption process.

Hypothesized antecedents to fishing socialization include social structural variables (such as gender, urban vs. rural residence as a child, family type – single-parent vs. two-parent, and age at time of fishing initiation). The social structural variables are related both to the age at which a person might be introduced to fishing and to the fishing exposure agents present for a young person.

Socialization processes include exposure agents such as family members and their fishing activity level, the proportion of extended family members who fished, and the nature of the exposures an individual has during early years. The nature or quality of these experiences can be described by particular exposure events, fishing methods and species sought, types of fishing related activities done before, during and after the earliest fishing experiences, and whether these specific activities or events had a positive or negative lasting influence on fishing interest. Also important in the context of socialization processes is the level of overall satisfaction individuals have with their earliest fishing experiences.

Early fishing experiences may result in the outcomes of fishing activity participation and interest in childhood, teen and early adult years (Figure 2-4). The developmental characteristics of youth during these stages may have implications for the development of adult involvement in fishing. Anglers have reported that they developed through distinct

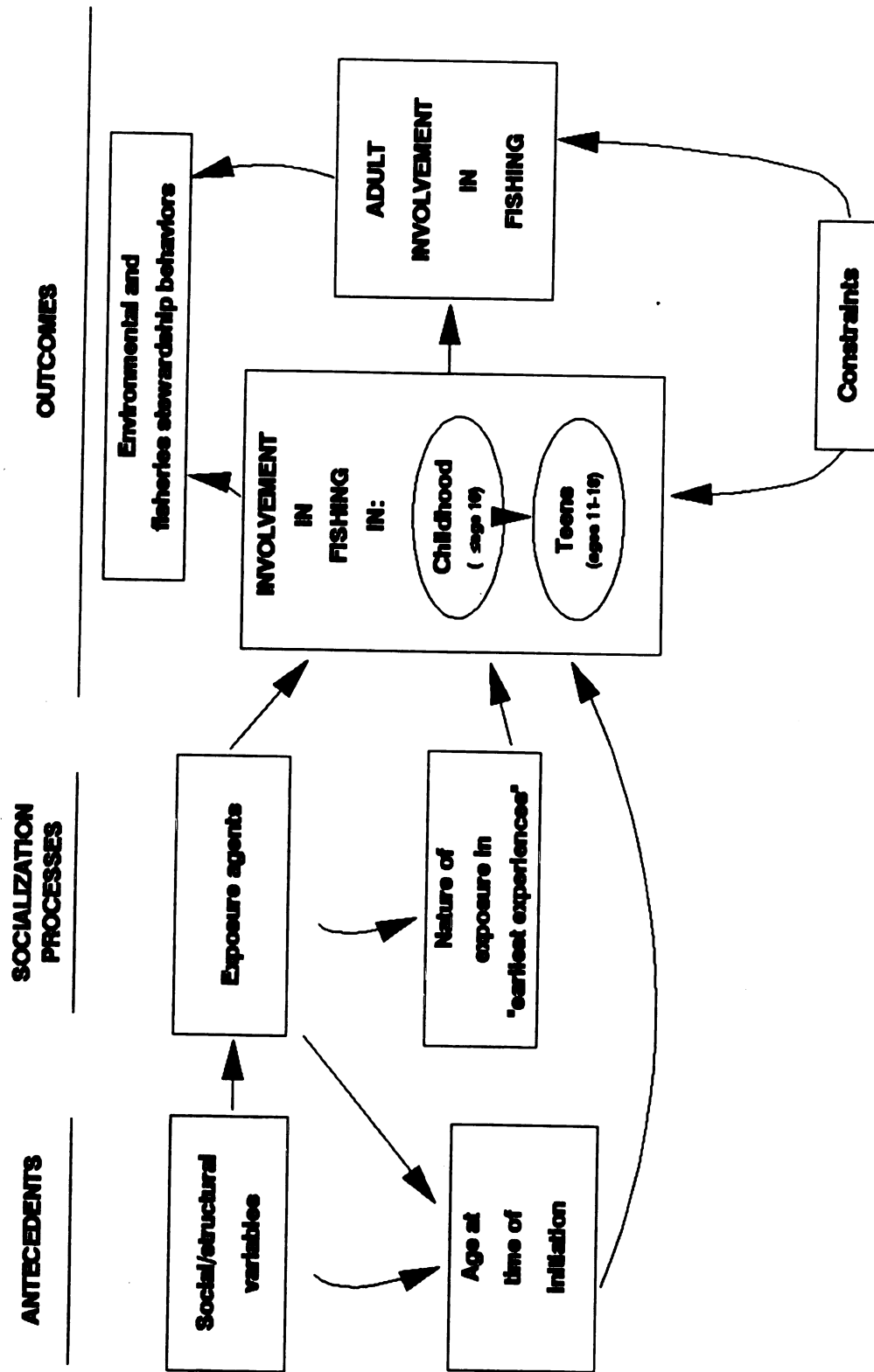


Figure 2-4. Proposed theoretical model of fishing socialization.

stages of fishing involvement, characterized by different levels of participation in childhood, high school years, college years, early years of marriage or career, and other periods (Siemer et al. 1989a).

Outcomes of fishing socialization can be described as involvement in fishing; this involvement includes both attitudinal components (such as fishing interest level, importance of fishing) and behavioral components (such as participation in fishing-related activities, fishing frequency, and consistency of fishing participation and license purchases over several years). Sets of factors, called recreational constraints, may intervene between interest in fishing and actual behavioral expression of that interest. One particular type of attitudinal outcome of fishing socialization consists of the benefits that an individual seeks from the fishing experience. Finally, many writers have considered the relationship between angling participation and development of environmental stewardship behaviors. These behaviors may also be related to early family influences (as shown in Figure 2-4).

This proposed model of fishing socialization might best be considered a person-process-context model for investigating developmental phenomena (Bronfenbrenner 1988). This type of research model provides a design for providing systematic information in at least three separate domains: personal characteristics of the developing individual, the context in which development is taking place, and processes through which development occurs. This type of model is more rigorous and revealing than others which consider only one or two domains; the person-process-context model guards against unwarranted generalizability across different types of persons or different environments affecting human development (Bronfenbrenner 1988). Furthermore, the proposed model of fishing socialization has some characteristics of a "chronosystem paradigm"; this design allows the researcher to identify impacts of prior life events or experiences on subsequent development (Bronfenbrenner 1988). In short, the proposed model of fishing socialization provides an innovative, rigorous, comprehensive framework for the investigation of the development of fishing involvement.

Operationalizing Fishing Involvement – The Dependent Variable in Fishing Socialization

Central to the problem of identifying factors which enhance fishing recruitment is the question of operationalizing fishing involvement (i.e. identifying when a person has truly "become an angler"). Recreational participation is a dynamic process; the development of an individual's "involvement" may occur quickly or require many years (Decker and Mattfeld 1988). People come and go from recreational populations for a variety of reasons regardless of their attitudinal preferences for and propensity to participate in an activity.

The simplest measures of recreational involvement are based on frequency of participation (often a one-item ordinal variable). Researchers have used just annual frequency of fishing or number of years as an angler to divide anglers into categories such as light-half vs. heavy-half participants (NPD Special Industry Services, Siemer et al. 1989b, Ditton et al. 1992). Some angler classifications are based solely on behavioral variables of continuance of or desertion from fishing. "Quitters/less frequent fishermen" in one study were those who fished in 1984 but not in 1985 (The NPD Group 1985); in another study, "active" anglers vs. "inactive" anglers were differentiated by whether or not they had fished during the last 12 months (Miller and Wasson, no date). Brown and Siemer (1992) defined "continuous" angling participants as those who had participated every year over a short period of time, "sporadic" anglers as those who had discontinued fishing for at least one year and then participated again, and "drop-outs" as those who had completely abandoned the activity. Reliance on such behavioral measures alone, however, can lead to erroneous conclusions about an individual's affective attachment to a particular activity, or their potential to continue to participate in the future (Backman 1991).

A similar error of omission is made when recreational involvement is measured only by affective variables. A recent investigation utilized strictly an attitudinal approach to conceptualizing a form of recreational commitment. McIntyre (1989) developed the construct of "enduring involvement" measured with three scales: "attraction" (importance and enjoyment

of the activity), self-expression (through the activity), and centrality of the activity to lifestyle). This framework was based on the work of many other researchers in recreation commitment, and on the work of consumer researchers Kapferer and Laurent who stated that enduring involvement "derives from the perception that the product is related to centrally held values, those defining one's singularity, and identity, one's ego" (1985:42).

Being a recreationist means having a "combination of beliefs, attitudes, and actions, and cannot be inferred from actions alone" (Decker and Mattfeld 1988). Buchanan (1985) offered a two-component definition of recreational commitment as "the pledging or binding of an individual to **behavioral acts** which result in some degree of **affective attachment** to the behavior or to the role associated with the behavior and which produce side bets as a result of that behavior" (p. 402, emphasis added). Three major components are necessary for the existence of committed behavior:

- 1) **focused behavior and rejection of alternative behaviors (i.e. a willingness to devote time and effort to the activity, or consistency of behavior persisting over time);**
- 2) **side bets (i.e. investments in such things as practice time, clothes and equipment, friendships, image presented to others or the net balance of rewards over costs);**
- 3) **a degree of affective attachment to the goals and values of a role, an activity, or an organization (Buchanan 1985).**

Buchanan (1985) also viewed commitment as a process along a developmental continuum, with continuance of the activity a demonstration of the lowest level (or an initial stage) of an individual's affective attachment to that activity. "Continuance" is defined as "the continuation of a particular behavior because the cost of terminating the behavior is greater than the cost of maintaining the behavior" (Buchanan 1985:405). An individual who continues an activity, then, simply may not have identified a suitable alternative activity to meet the same needs. The consumer evaluates an activity during every engagement, and this evaluation leads to the outcome of continuance or discontinuance (Backman 1991).

Continuance is manifested by repeat participation in an activity (Backman 1991).

"As participants continue to participate in the activity, they learn more about it, develop or modify their existing beliefs and attitudes toward it, and continually re-evaluate the activity. Hence, continued participation in the activity leads either to a decision to continue to participate in the activity or to not to continue participating in the activity" (Backman 1991:335).

Cohesion, the second level (or stage) of affective attachment, is the "commitment of the individual to group solidarity" and involves "positive emotional attachments to other participants" (Buchanan 1985: 405). Finally, control is the highest level (or final stage) of affective attachment and is shown by "a dedication to and acceptance of the norms, values, and inner convictions of the principal actors within a social network" (Buchanan 1985: 407). At this highest level of the commitment continuum, self-identity and self-concept are associated with the activity and the activity permeates major facets of an individual's life (McIntyre 1989). The assumption here is that recreation behavior is goal-directed and can be explained by personality theory. In other words "commitment...results from individuals behaving consistently with how they view themselves and how they would like to be viewed by others" (Buchanan 1985:407).

There have been three main approaches to operationalization of commitment (Buchanan 1985). The first approach uses the amount of past experience with the activity, and may include the variables of age, frequency of participation, years of participation, or the number of times one engages in one activity relative to other activities. The second approach uses variables which relate to the centrality of participation in the activity to the individual's lifestyle. These variables include: number of social relations attached to a particular activity, importance of activity in relation to other interests, and resistance to change. The third approach to operationalization measures the degree of investment (side bets) in a particular activity; these variables include: equipment owned, organizational membership, money spent, length of training, miles travelled, and other facets (Buchanan 1985). A similar approach was used by Brown and Siemer (1992), who utilized "personal

investment theory", as described by Maehr and Braskamp (1986); in this approach, an individual makes personal investments of time, energy and resources in an activity and periodically evaluates that investment in deciding whether or not to continue it.

The most recent research on recreational involvement incorporates both attitudinal and behavioral measures. In their classification of salmonid anglers, Brown and Siemer (1992) described "heavily invested salmonid anglers" as those who fished at least the mean number of days in a given year, fished at least 21 days that year for salmonids, spent more days fishing than in any other recreational activity, and reported fishing as their most important recreational activity.

Ditton et al. (1992) utilize some aspects of "involvement" in their conceptualization of specialization using a social worlds perspective. Social worlds are collections of actors, organizations, events and practices which have coalesced into a perceived sphere of interest and involvement for participants (Unruh 1979). Features of a social world include a primary activity (e.g., fishing), sites, technology, and organizations. Personal involvement in a social world is voluntary, and participation may occur through "mediated interaction" (i.e. communication through such channels as television, magazines).

Over time, members of social worlds may progress through 4 subworld types: strangers, tourists, regulars, and insiders (Unruh 1979). This progression, however, may not be linear nor inevitable. As they progress, individuals will differ in their orientation (the extent to which the individual understands or belongs to the subworld), experiences, relationships with others, and commitment to the primary activity. In their orientation to the activity, strangers have a simplistic perception whereas insiders understand the activity, and it is central to their lifestyle. Strangers don't understand the experiences available to them, whereas insiders know how to obtain information, better understand the activity, and may even create experiences for others and actively recruit new members to the subworld. Strangers lack relationships with others in the social subworld, whereas insiders have regular contact with other members, some of whom may be close friends. In terms of commitment to

the activity, strangers are detached, tourists are in a "trial" phase, and insiders are so committed that the activity constitutes a portion of their personal identity.

Ditton et al. (1992) used these concepts to formulate the following 8 propositions:

- Individual recreationists increase in specialization over time.
- As specialization increases
 - there is increasing value of side bets (equipment, costs);
 - the activity is increasingly central to one's life (i.e. as measured by importance rating, frequency of participation, proportion of time spent on activity);
 - the individual increasingly accepts rules, norms and procedures;
 - there is increased importance of equipment and its skillful use;
 - there is increased dependency on resources;
 - there is increased use of mediated interactions (e.g., TV, magazines, radio, organizational membership)
 - there is increased importance placed on non-activity-specific elements of the experience.

Another approach to conceptualize involvement utilized theory and research on consumer behavior to describe the construct of loyalty (Backman 1991). In the marketing context, loyalty is used to describe consumer commitment to particular brands (Backman 1991). Simply defined, loyalty to a recreation activity is "committed behavior that is manifested by the propensity to participate in a particular recreation service (Backman and Crompton 1991: 205)". Loyalty implies that the individual has rejected other activities, and as a result, has invested time, money, and energy in the selected activity (Backman and Crompton 1991). However, loyalty involves more than simple repeat use of a product or repeat behavior (i.e. "continuance"). Instead, loyalty is a two-dimensional construct which draws upon both the affective and behavioral components of an individual's past recreation experience (Backman 1991). Given this two-dimensional operationalization of the construct of loyalty, recreation participants can be classified according to loyalty to an activity as shown in Table 2-1.

Table 2-1. Classification of recreational participants according to Backman's (1991) concept of loyalty.

Loyalty Category	Affective Attachment to Activity	Behavioral Loyalty (Frequency of Participation)
High Loyalty	High	High
Spurious Loyalty	Low/weak	High
Latent Loyalty	High	Low
Low Loyalty	Low/weak	Low

Spuriously loyal or low loyalty persons are more likely to discontinue participating or switch activities due to weak attitudinal attachment to the activity. In addition, spuriously loyal participants are more likely to be taking part due to external factors (such as friends' participation) than due to internal motivations. The identification of persons (consumers) likely to discontinue an activity would assist recreation managers in developing strategic marketing plans to enhance consumer retention (Backman 1991).

While the definitions of recreational commitment are continually evolving, future studies need to maintain this trend of incorporating both behavioral and attitudinal dimensions in operationalizing angling involvement. The processes of development of angling commitment are certainly complex, and involve both attitudinal development as well as changes in behavioral patterns over time. These two dimensions are included in the typology of angler involvement to be used in this study (Table 2-2). By considering both dimensions of involvement, recreationists can be categorized more effectively into meaningful groups for management decisionmaking and for marketing of specific program offerings.

Table 2-2. Typology of fishing involvement based on Backman's (1991) concept of loyalty.

Involvement Category	Affective Attachment to Fishing (Fishing commitment scale)	Fishing Behavior Level (Frequency of Annual Participation)
High involvement	High	High
Spurious (Moderate) involvement	Low/weak	High
Latent (Moderate) involvement	High	Low
Low involvement	Low/weak	Low

Antecedents to Fishing Socialization

Various researchers have investigated the relationships between such antecedent variables as gender, residence area, and race and fishing participation. Race and residence area appear not to exert a significant influence on fishing socialization or participation during childhood (Dargitz 1988). Being raised in an urban area was, however, a strong predictor of hunting nonparticipation (Wright and Goodale 1991), so this antecedent needs better scrutiny in relation to fishing involvement levels.

Gender may have a very important influence on socialization, on participation and on enjoyment of the activity. Using regression analysis, Dargitz (1988) found that gender was a significant predictor of children's fishing frequency and enjoyment. This is probably due to differences in sex role socialization, in which girls are less likely than boys to have the same freedom to go fishing wherever and whenever they desire (Dargitz 1988). Child development researchers report that early adolescence (ages 10 to 13) is one of the most sexist periods in the life span (Steinberg and Levine 1990). Adolescence is a time of increased insecurity about identity, thus a girl may be unlikely to participate or admit enjoying an activity (such as fishing) which is inconsistent with existing sex role stereotypes. A youth's gender affects consumer socialization by peers; females are more likely than males to discuss consumption with peers and to model themselves after peer consumer behaviors (Moschis 1987). In short,

female youths are more susceptible than males to peer influence (Moschis 1987). Television advertising also contributes to the acquisition of traditional sex roles (Moschis 1987).

Recreation trends research indicates that women are less than half as likely as men to go fishing, and that this statistic is not likely to change in the future (Kelly 1987).

Age at time of socialization is also an important factor in influencing fishing behavior. Many studies have demonstrated that greater angler activity is related to an early start in fishing (Sporting Goods Business 1990, Harrington Market Research and AFTMA 1990). Female anglers were introduced later in life (by spouses) than were males (Howard 1979). A higher proportion of female hunters than male hunters were introduced to hunting later in the life cycle by their spouses (McCarty 1985). Furthermore, they hunted a shorter time than males. In general, young children may have little say in which recreation activities the family pursues (Dargitz 1988). With increasing age, adolescents using a larger variety of information sources and acquiring greater independence from his/her family in purchasing products (Moschis 1987). Thus, they will exert increasing choice and independence in leisure pursuits.

Family type ("traditional" vs. single-parent) influences the particular recreational activities undertaken by families (Orthner 1974; Orthner 1978). There have been no specific studies of the influence of family type on youths' recruitment into fishing and subsequent fishing involvement. In general, though, single-parent families face the stressors of task overload (overwork in caring for children and maintaining a household alone), financial strain, social isolation of mothers, problems in raising children alone, and the lack of a spouse present in the home to buffer personality differences between children and the single parent (Santrock and Warshak 1979, Hetherington et al. 1982, Weinraub and Wolf 1983). All of these stressors certainly interact to affect recreational choices made by such families. Additional research needs include examination of family types (e.g. single-parent families, remarriage families) and the effects of family type on recreational participation (Holman and Epperson 1984).

Research Questions and Hypotheses Pertaining to Antecedents to Fishing Socialization

- I. **RESEARCH QUESTION:** How are antecedent variables (such as sex of youth, rural vs. urban residence as a youth, traditional vs. single-parent family as youth, and age of youth at time of fishing introduction) related to fishing socialization and involvement?

Hypotheses:

- a) **Males, rural youth, and youth from "traditional" (two-parent) families more frequently reported they...**
- **had greater socialization in fishing from immediate and extended family.**
 - **had favorable outcomes (satisfactions) from fishing exposure.**
 - **had different early exposure (socialization) experiences with different outcomes in influencing further involvement in fishing.**
 - **had an early introduction to fishing.**
 - **have greater childhood, teen and current involvement (attitudinal and behavioral) in fishing. Single-item measures of current fishing involvement include consistency of fishing participation and license purchasing behavior over the last 5 years, importance of fishing, interest in participating more in fishing, and total days per year of fishing participation.**
- b) **There is/are critical age(s) of exposure to fishing such that:**
- **those whose families participated more in fishing have an earlier introduction to fishing than those without family support.**
 - **those who had earlier introduction to fishing had greater teen and current fishing involvement.**
 - **those who had earlier introductions to fishing report greater satisfaction with early fishing experiences.**

- age of fishing introduction is related to frequency of certain catch-related experiences (i.e. catching no fish, catching lots of fish, catching large fish), and the impacts of these experiences on fishing interest varies depending on the age of exposure.
- c) Cohort effects will be observed on antecedent variables and on outcome variables (e.g., older age cohorts had earlier and greater childhood exposure to fishing, and have greater current involvement in fishing).

Socialization Agents and Processes

The Influences of Social Groups on Fishing Participation

Antecedent variables alone do not suffice to explain recreational participation; to address this, the study of the effects of social groups on recreational participation emerged (Field and O'Leary 1973, O'Leary et al. 1974, Christensen 1980, Dottavio et al. 1980). A social group may be defined as a group of individuals who define or recognize themselves as members of a group and who are also defined by others as members (Merton 1957). Davis (1969: 4) defines a social group as "a set of mutually interdependent behavioral systems that not only affect each other, but respond to exterior influences as well". A social group has a set of unique, identifying behavioral characteristics that distinguish it from other social groups (Allen and Donnelly 1985). Social groups are important determinants of individuals' outdoor recreation behavior; social groups not only influence what people do by way of recreation, but also why they do it and with whom (Buchanan et al. 1981).

Various researchers have investigated the relationship between social group and recreational participation; some have even investigated this relationship specifically for fishing. Buchanan et al. (1981) found that social groups vary in the way in which they define experiences provided by an activity; their work included an examination of the social groups participating in boat fishing. Allen and Donnelly (1985) researched the social units in which individuals participate for their "most enjoyable" activities, as well as the relationship between

social unit and reasons for recreational participation. Their findings suggest the importance of the family as a social group influencing leisure behavior (Allen and Donnelly 1985). An implication of these findings is that agencies might use this information to design recreational opportunities to attract certain social groups such as families to participate (Allen and Donnelly 1985).

The Influences of Family on Recreation Socialization and Participation

More than any other social group, the family influences individuals' recreation participation throughout the life course. Except for adolescents and young, unmarried adults, the family is the center of most peoples' leisure activities (Holman and Epperson 1984). The family is the most popular social group with which individuals spend nonwork time, and family activities dominate the rankings of adults' most important leisure activities (Kelly 1978). Most leisure activities are either initiated in the family of orientation (i.e. as a child with one's parents) or the family of procreation (i.e. as a married adult with children) (Kelly 1978). Furthermore, most activities take place in either the marital or familial context, regardless of the ages or the family lifecycle stages of individuals, or types of families within which individuals are found (Kelly 1978). Many people desire even more family-related recreational opportunities (Holman and Epperson 1984), thus presenting a potential marketing opportunity for recreation programmers.

Some researchers have specifically investigated the influence of parental recreation on children's recreation participation. Kelly (1974) found that half of most adults' recreation activities were begun while the individual was a child and in the family of orientation. Dargitz (1988) found a significant relationship between the fishing participation of adults in children's households and the children's fishing frequency. The leisure satisfactions of parents better predicts preschool aged children's play behavior than do parental leisure behaviors or other leisure attitudes (Barnett and Chick 1986). Furthermore, children's play behaviors were as influenced by family characteristics (such as gender of siblings, age of parents, professional

employment of parents) as by parental leisure characteristics (Barnett and Chick 1986). In addition, both boys and girls' play behavior was more strongly related to their mothers' leisure participation than to their fathers'. In summary, "repeated exposure to a parental model performing an activity provides normative information about appropriate behavior in that activity" (Barnett and Chick 1986: 267). Not only may children model their participation patterns after adults, but they may also mimic the ethical nature of parent's participation. Barnett and Chick note, however, that such modelling by children may be limiting; the child may "assume that the modelled pattern is the only correct way to perform that activity, thereby limiting the number of [play] alternatives the child may explore" (1986:267).

Other specific familial variables which influence recreational participation include presence or absence of children, age of children (family life cycle stage), parental employment levels, family socioeconomic status, family type, and family size (Holman and Epperson 1984). Family life cycle influences: amount of time available for leisure, types of leisure activities chosen by families, frequency of participation in particular activities, and whether or not activities are participated in jointly or independently by family members (Holman and Epperson 1984). Larger families tend to participate more in leisure activities (Holman and Epperson 1984). If preschool children are present in the household, mothers are more likely to take the leadership in recreation decision making (Carlson 1979). If teens are present, family vacations tend to decrease (Crompton 1981). If mothers are employed, the male is more likely to make the family's recreation decisions, and there is less leisure time available to the family (Holman and Epperson 1984).

Using his model of consumer socialization, Moschis (1987) reviewed an extensive array of literature describing relationships between family variables and consumer behavior. Parents certainly influence the development of their children's consumer preferences and their motivations for consumption. The degree and type of parental influence on consumer learning of their children is affected by the child's sociodemographic characteristics. For example, parental influence on consumer learning is greater among girls than among boys.

Family communication processes modify and channel the influence of information from nonfamily sources such as peers. More specifically, peer influence on consumer behavior development by children is lower if the family is cohesive or if parents spend a great deal of time interacting with their children (Moschis 1987).

More research on parental influences on children's recreation is certainly needed. Further study is needed to determine the influence of "significant others" at different stages in the life cycle on childhood-to-adult recreational carry-over (Yoesting and Christensen 1978).

Barnett and Chick conclude that

"if it could be argued that children model or imitate much of the attitudes, satisfactions and behaviors of their parents at leisure, then intervention strategies could focus more on familial assessment techniques for diagnosis and remediation" (1986: 278).

Family leisure theory is in its infancy, and researchers should not rely solely on family life cycle, but should include "discrete continuous variables" to measure specific transitional phenomena such as presence of preschool children, spouse/parent employment status, and voluntary association involvement to determine their effects on recreational participation from a family developmental theory framework (Holman and Epperson 1984). Models of recreational participation should draw upon systems theory to examine more fully the attitudes, needs, and behaviors of all family members and combinations of family members (or family subsystems) (Holman and Epperson 1984). Conceptual theory and better research methodologies and statistical techniques should be used to both theoretically and operationally define the complexity of the family and its subsystems (Holman and Epperson 1984). These researchers cite Iso-Ahola (1980) as calling for researchers to utilize a path model going from family members attitudes about family leisure activities, to intentions to participate, to the dependent variable of actual participation in order to more fully explain family members' participation in leisure activities.

The Nature and Quality of Fishing Socialization Processes

Little is currently known about how the nature and quality of early fishing socialization experiences affect fishing involvement. Brandenburg et al. (1982) described the importance of key events in recreation socialization, but no specific studies have been done in relation to fishing participation. One framework for considering the vast array of experiences which might occur in early fishing socialization is presented by Fridgen (1984). The recreational experience is comprised of five phases of participation: anticipation of the experience, travel to the recreation environment, on-site behavior, return travel, and recollection of the experience (Fridgen 1984). Marketing researchers have investigated facets of on-site behavior in comparing anglers and ex-anglers. Not catching fish and contact with fish (handling fish, baiting the hook, cleaning the fish) were the least liked facets of fishing reported by "quitters" (or ex-anglers) (The NPD Group 1985, Harrington Market Research and AFTMA 1990). The main reasons reported for quitting, however, were increased family commitments and not having fishing partners (The NPD Group 1985, Harrington Market Research and AFTMA 1990). Anticipation of fishing, eating the fish, and memories about fishing were mentioned as aspects liked by both quitters and anglers (The NPD Group 1985, Harrington Market Research and AFTMA 1990). No studies have examined the relationship between these facets of the fishing experience and early fishing involvement. In addition, there is little information regarding the impacts of childhood exposure to fishing through clinics, youth camps, youth organizations, and other sources on fishing interest and activity. Researchers agree that the concept of socialization (prior experience) as a process in the social experience of leisure should be broadened (Dottavio et al. 1980).

Research Questions and Hypotheses Pertaining to Socialization Agents and Processes

- IIa. RESEARCH QUESTION:** How is the presence of fishing socialization agents (sources of early fishing exposure such as family and peers) related to fishing involvement?

Hypotheses:

- Family-supported young anglers (those with immediate and extended family members who fish) had greater exposure to fishing throughout childhood and teen years and have greater current fishing involvement than non-family supported anglers.

IIb. RESEARCH QUESTION: How do socialization processes (the nature and quality of early fishing experiences) affect teen and current fishing involvement?

Hypotheses:

- Youth involvement in family outdoor recreation activities such as water-related activities, camping, and fishing while camping are related to early fishing satisfaction and to childhood, teen and current fishing involvement.
- Other non-family (institutional) socialization processes are related to satisfaction with early fishing experiences and with long-term fishing involvement. These sources include: organizational exposures (early experiences at camps, with youth groups such as Scouts or 4-H), experiences at fishing clinics (such as Free Fishing Days events), or fishing experiences at school or at trout farms (or other fee fishing facilities).
- There exist many elements of early fishing exposures (related to the quality and extent of participation) which affect continued fishing involvement and activity level. These variables include anticipatory elements, experience elements and recall/reminiscing elements. More specifically, current fishing commitment levels are higher for individuals who (at the time of early exposure): were included in planning early fishing outings, caught fish, caught "lots of fish", caught big fish, had hands-on experience with fish caught (landing own fish, handling fish, cleaning fish) or with casting own lures/bait, ate fish caught, had no equipment problems, were not afraid of water or bothered by insects or weather, were not negatively affected by having to

follow strict rules while fishing or by seeing fish die, and who enjoyed the outdoors, water or wildlife while fishing.

- Those who had satisfying early fishing experiences demonstrate greater subsequent (current) fishing involvement than do those who were dissatisfied with early experiences.
- Participation in a more generalized form of fishing (i.e. for panfish or other easily accessible/plentiful species at a site appropriate for a beginner such as a pond or river edge), rather than a more specialized form (such as stream fishing or Great Lakes fishing) is related to greater current involvement in fishing.

Youth Development and Implications for Development of Fishing Commitment

Development in Childhood (From birth through about age 10)

Although profound development takes place prior to birth, the infant first comes into contact with social contexts of development soon after birth. During infancy and toddlerhood (up to about age 2), the primary influences on development are the immediate family and caregivers (Figure 2-5). Physical and cognitive development during this period are tremendous; senses and perception develop along with language skills. Family members contribute key words (called pivot words) such as "see", "look", to the child's vocabulary (Braine 1963). In the domain of social and personal development, infants progress from attachment to parents and caregivers to develop an early self-concept by about the age of 2 years. The child's self-concept includes and is based on what he/she is capable of doing. Since some people report starting fishing during toddlerhood, these patterns of early family influence may have some effect on this early fishing exposure.

During the preschool years (ages 2 to 6 years), motor skill development is still a key feature. During this time, most of the fundamental motor skills are learned; play is important in this learning process, and outdoor play is thought to contribute greatly to acquisition of large motor skills (Schiarnberg 1988). Preschoolers increasingly play with objects and with social materials; social, dramatic and pretend play increase (Piaget 1962).

Cognitive development during the preschool period is also very obvious. According to Piaget's theory of cognitive development, children at this age are in the stage of pre-operational thought; their thinking processes are intuitive and depend on perceptions rather than logical thought (Schiarnberg 1988). Preschool children are capable of learning to categorize, classify and organize objects into egocentric categories (Piaget 1963). Their drawings progress from being shapes to more complex designs and finally to true pictures. It is during this period that children are the most curious and ask the most questions (Henderson and Moore 1979).

Preschool social and personal development is focused on formation of a self-image

0.10-2.1

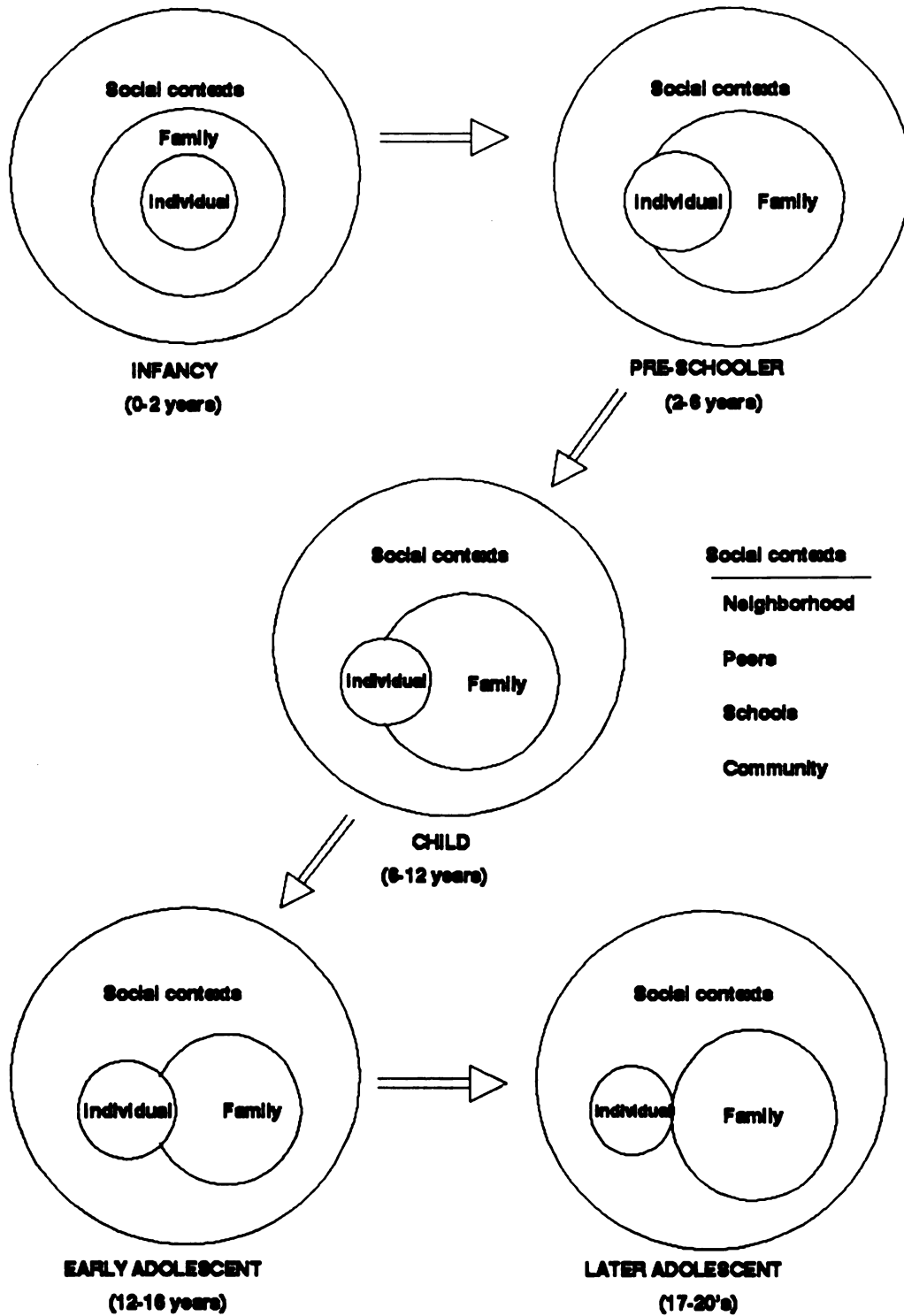


Figure 2-5. Contexts of and influences on development at various stages in childhood and adolescence (from Schiamberg 1988:193, 313, 447, 596, 599).

separate from parents. Erikson calls this the stage of initiative vs. guilt – the period of gaining independence from parents (Erikson 1963). By age 4, children attach importance to their possessions, and later describe themselves in relation to their possessions. By age 5, most children are being exposed to peers and using peer evaluations of them in refining their self image. By age 6, children verbalize their self image in terms of likes and dislikes (i.e. "I enjoy..."); they also view themselves in terms of categories such as gender, age, activity preferences and values.

There are some possible implications of preschool development for development of recreational interest in youth. Because of the importance of play during this age, encouraging play with imaginary, toy or real fishing equipment may help in fostering interest. As the child is older (and some motor skills are more refined), the acquisition of a fishing rod or other equipment of one's own may help incorporate fishing into the child's early self-image, during the time when self-image is simply defined by possessions and activity likes/dislikes. Finally, due to the child's curiosity and lack of fine motor skill development at this stage, "being still" may be a skill which is necessary to teach in small doses while fishing.

During middle childhood, from approximately ages 6 to 12, the child is much more involved with microsystems other than the family (e.g., peers, school, neighbor children) (Figure 2-5). Physical development is slower and more gradual during this period than in preschool years, but development of fundamental motor skills is nearly completed during middle childhood (Schiarnberg 1988). During this age period, children still have limited mobility and a number of parental constraints (Rejeski 1982).

During middle childhood, cognitive development is remarkable. For much of this period, children this age are in the so-called concrete operational stage, in which thinking is characterized by logical, concrete processes (Piaget 1963). As this stage ends (by about age 11 or 12), thinking becomes less dependent on perceptions, more dependent on logical operations, and more flexible (Schiarnberg 1988). The child also becomes increasingly able to deal with concepts (including the concept of causality), to do problem-solving and

hypothesis testing, and to take multiple perspectives. As an example of this cognitive development, children's conceptions of death change during this period. At first (under ages 6-7) children do not recognize the irreversibility of death, and view it as magical, and occurring for eccentric reasons. From ages 7-11, children view death in concrete terms, but after age 11 or 12, they can understand the more abstract concepts of death (Keecher 1975).

Several researchers have observed the implications of cognitive development in middle childhood for the development of interests in and knowledge about environmental features. During the ages of approximately 6-7, children are fascinated mostly with the universal or the ubiquitous features (e.g., trees, flowers) and are in a stage called "literalism" (Rejeski 1982). Their egocentric views of their environment limits their understanding of environmental concepts. They draw upon what they know, rather than what "might be" in their understanding of the world. In their perceptions of the environment, they blend the animate and the inanimate, and attribute emotions to inanimate objects (Rejeski 1982). Kellert and Westervelt (1983) report that between the ages of 7-10, children are the least informed about animals and the most exploitive. From about ages 9-10, children begin to incorporate both direct experience and vicarious experience (i.e. from reading) into their cognitive schemes for understanding their environment (Rejeski 1982). In this stage, called "organization", children use their newly developing cognitive skills to classify objects and use symbols to describe their world (Rejeski 1982). They also begin to be aware of human impacts on environments.

In the domains of social and personal development, middle childhood is an important time. Because of cognitive and social abilities at this time, children's impulsive behaviors begin to decrease (Schiamberg 1988). A theme important for this age group is the continuing development of self-image or self-concept; at this age, development of feelings of self-competence emerge. Erikson calls this the development of a sense of industry; children are striving to believe "I am what I learn" (Erikson 1959). A child's self-concept is now more influenced by feedback from peers and adults, and is influenced by success at learning such

skills as reading and writing (Schiarnberg 1988). By the age of 8, the child evaluates him/herself in comparison with others (Schiarnberg 1988). An organized system of self understanding becomes the basis for the child's sense of competence; this system includes the child's sense of physical self (behaviors related to the child's physical characteristics), the active self (behaviors that influence other people), the social self (behaviors based on approval or disapproval of others), and the psychological self (behaviors which include learned skills) (Damon and Hart 1982). Changes in cognitive and personal/social domains lead to development of achievement motivation, the internal motivation to achieve high levels of performance with respect to certain standards of excellence. Before age 7, the child thinks of ability or achievement in terms of a specific skill for doing an activity; after this age, the child recognizes achievement as a more global and stable characteristic of a person and increasingly uses comparison with peers for self-evaluation of his/her achievement (Heckhausen 1981, Ruble 1985). During middle childhood, the child becomes less egocentric, and develops a better understanding of the thoughts and viewpoints he/she holds, and those held by others (Schiarnberg 1988). By about age 6-8, children can recognize that different individuals hold different perspectives; youth ages 8-10 are able to consider others' viewpoints in more depth, and by ages 10-12, they can actually put themselves into another's place (Selman 1976). Later, in adolescence, the youth will be able to compare individuals' perspectives with those of broader social systems (Schiarnberg 1988).

Taken together, these developmental changes in middle childhood have some likely implications for the development of fishing interest. Children this age are intrinsically interested in the outdoors, animals, and in developing competence in activities they enjoy. Their physical abilities make it easier for them to stay still longer and to use the particular skills necessary in fishing. Since children do activities primarily due to intrinsic motivations, for curiosity, and for rewards such as feeling competent in their environments (Iso-Ahola 1989), it is important to provide them repeated opportunities to express their intrinsic motivation in choosing recreation activities. In this way, repeated exposures to an activity

such as fishing may help the child develop a predisposition toward longer-term intrinsic motivation for the activity (Iso-Ahola 1989). Several researchers have noted the importance of childhood leisure activities in influencing later adult participation in recreation (Sofranko and Nolan 1972, Yoesting and Burkhead 1973, Kelly 1974, Kelly 1977). In general, if a person is active in outdoor recreation as a child, the person is likely to be active as an adult (Yoesting and Burkhead 1973), and half of adults' recreation activities had been started while a child (Kelly 1974; Kelly 1977). Two important reasons why childhood recreational experiences may be so important are that 1) childhood experiences may predispose an individual toward certain types of activities, and 2) acquisition of important recreational skills as a child may facilitate participation later as an adult (Yoesting and Christensen 1978). The centrality of achievement motivation in children's development may mean that concrete, satisfying, catch-related fishing experiences may even contribute to a child's feeling of self-competence, thus reinforcing a personal interest in the activity. If fishing is successfully incorporated into the child's self-concept at this age, the individual may retain a lasting interest in this activity.

Development during Adolescence (from About age 11 to age 18)

Adolescence is a time of transition from a world of dependence on family to a life composed of more freedom, conflicting values and multiple influences in microsystems and mesosystems (Figure 2-5)(Steinberg 1980). Early adolescence (from about ages 10 to 15), in particular, is characterized more by change than by stability (Steinberg 1980). Transition into adolescence is marked by the physical onset of puberty. Although developmental changes are interrelated, the profound changes in physical characteristics and cognitive abilities appear to drive the changes the adolescent experiences in social and personal development.

Adolescent physical development is characterized by dramatic growth and physical changes due to puberty. During this period, the young person acquires the body size and

characteristics of adulthood (Hill 1980); differences develop between males and females in size, strength, and primary and secondary sex characteristics. Variations, however, are great among individuals in their rates of development at this time (Hill 1980). These dramatic changes in appearance lead to changes in expectations of others in the youth's social systems; the adolescent who has experienced puberty may now be expected to behave as an adult, although he/she will undergo further cognitive and social changes before truly reaching adulthood (Hill 1980). In addition, physical changes lead to greater interest by the teen in dating and courtship (Hill 1980).

Cognitive changes in the adolescent are no less dramatic. Their mode of cognitive functioning changes from Piaget's concrete operational stage (in which the person primarily considers concrete objects or situations and classifies, orders and categorizes such objects and situations) to the formal operational stage. In this stage, adolescents can now consider possibilities and hypothetical situations, multiple simultaneous causal factors (in testing hypotheses, for example), abstract ideas and concepts, and perspectives of others (Piaget 1970, Hill 1980, Steinberg 1980). These abilities raise new developmental issues for teens. For the first time, teens no longer accept parents as always being correct (Steinberg 1980), and relationships with parents change. The early adolescent, in particular, is introspective and uses more reflective thinking in considering one's self (Hill 1980 and Schiamberg 1988). Teens become increasingly concerned with ethics, career development, and issues of identity (Schiamberg 1988; Steinberg and Levine 1990). Teens become more idealistic and future-oriented, and they become increasingly able to understand government and political concepts (Gallatin 1980, Schiamberg 1988). In the areas of environmental understanding, during ages 10-13 there is a great increase in factual knowledge (Pomerantz 1989); by ages 13-16, youth are interested in animals for ecological and moral reasons (Kellert and Westervelt 1983). In this stage of "moralism" around ages 13-14, teens recognize humans as part of natural systems and become more sensitive to environmental issues (Rejeski 1982). In summary, adolescents have developed the physical and cognitive skills necessary to fully pursue their

own hobbies and interests; furthermore, they have fewer responsibilities than older adolescents and thus, this period is an important time to explore personal interests, discover talents, and develop special skills (Steinberg and Levine 1990). During the junior high period youth should have a variety of extracurricular opportunities to promote discovery and development of the teens' identity (Hill 1980).

In the domains of adolescent social and personal development, peers become a very important influence. Most of a teen's time is spent with friends or classmates (Csikszentmihalyi and Larson 1984). Various recreation researchers report that during adolescence, peers increase in importance (as compared with the importance of family) as significant influences on behavior (Yoesting and Burkhead 1973). Peers provide teens companionship, transmit knowledge, provide status (thus enhancing development of self-image), provide norms to guide behaviors, help teens in gaining distance from the family, and serve as a testing ground for behaviors, abilities, emotions, feelings, values and lifestyles (Hartup 1984, Williams and Stith 1980). Teen conformity with peers is greatest during early adolescence, and susceptibility to peer influence peaks at about 8th or 9th grade; in later adolescence, peer influence declines and the older teen is typically more interested in individuality (Moschis 1987, Steinberg and Levine 1990). In early adolescence, teens spend time in unisex cliques, and later, heterosexual cliques become more common; teen cliques are formed based on economic class, age, and common interests (including leisure interests) (Dunphy 1963). Teens spend up to 40% of their waking time in leisure activities, with socializing as the most common leisure activity, and watching television as the second most common activity (Csikszentmihalyi and Larson 1984). In spite of the great influence of peers during adolescence, most teens still turn to parents as a source of values and guidance on important issues, most would like to spend more time talking with parents than they do, and the stereotype of teen-parent conflict is sometimes over-exaggerated (Steinberg 1980; Steinberg and Levine 1990).

In addition to the issue of autonomy (emotionally and behaviorally) from parents, the issue of identity formation is a central issue in adolescence (Hill 1980). Cognitive, physical, moral and social changes in the teen lead to the centrality of this issue of identity (Schiarnberg 1988). Identity is the self-structure or internal organization of values, beliefs, attitudes, abilities, feelings and prior experiences of the individual (Schiarnberg 1988). The family, of course, plays a significant role in the formation of the teen's identity, but the peer group is important during this time of trying on new identities, particularly in later adolescence from ages 14 to 17 (Super 1953, Hill 1980, Steinberg and Levine 1990, Garbarino 1992). Identity formation might be considered the process of learning who you are and where you stand in social systems; successful identity formation is essential in order to develop into a competent individual (Garbarino 1992). Sexual identity, in particular, becomes an central concern in adolescence; the pressure to behave in sex-role-appropriate ways increases during adolescence. This pressure to conform to sex role stereotypes may be more intense for girls than for boys during this period (Hill and Lynch 1983). Steinberg and Levine (1990) suggest several strategies for developing positive identity or self-interests in teens: provide opportunities and encouragement for activities and hobbies teens can master, praise teens' efforts and achievements, give real responsibilities which are oriented to serving or helping others, encourage independent thinking, and support friendships of teens.

There are many implications of adolescent developmental phenomena for fishing involvement both in the teen years and on a continuing basis. Research on consumer socialization shows that the attitudes and behavior patterns established during adolescence can be carried over into adulthood and become part of a person's way of life (Moschis 1987). Since early adolescence, in particular, is a time for trying new hobbies and interests, fishing could be a positive experience for teens. Leisure experiences such as hobbies, sports, clubs and learning activities are considered "transitional activities" which serve to contribute to adjustment to adulthood and as a developmental link to experiencing enjoyment in adult endeavors (Caldwell and Bence 1993). If a young person had no previous introduction to

fishing, it could occur in adolescence as a function of school-related or peer-influenced opportunities. If a teen had experienced fishing earlier in childhood, fishing participation in the teen years could be reinforced by peers who were also interested in the activity, and as a means of spending some recreational time with parents or other family members. Since teens are gaining mobility and separation from parents, they may have greater opportunity to venture out on their own fishing experiences with peers. There are, however, many aspects of the adolescent years which might interfere with fishing initiation or participation. Since cliques are popular and such a great deal of time is spent in leisure activities such as socializing, if fishing is perceived as not appropriate or "cool" by a particular group, even a teen with adequate childhood socialization to fishing might decrease his/her fishing activity in adolescence. Furthermore, there is a great deal of competition during this time for a teen's interests; other recreational pursuits, interest in the opposite sex and dating, and work obligations may undermine interest in family-based recreation such as fishing. Constraints to leisure activities for adolescents include lack of transportation, cost, lack of skill, and peer pressure (Hultsman 1992). Girls, perhaps more than boys, may have other competing interests and may view fishing as stereotypically male and therefore undesirable as an activity. Since identity formation is such an important developmental task for teens, if fishing participation can be maintained during this period, the individual may maintain a lifelong interest in the activity as a part of his/her identity.

There is no definite demarcation of the end of the adolescent period (Schiamberg 1988). Over generations, the adolescent period has increased in length, as our society has emphasized more education (and thus longer dependence on the family of origin) (Schiamberg 1988). Typically, at the ages of 18-20, the individual is faced with the developmental tasks of leaving home and establishing a career, but the young adult is also still dealing with the developmental issues of identity and relationship formation (Steinberg and Levine 1990). Usually by the ages of 24-26, most individuals have gained financial and emotional independence from the family of origin and are able to freely express their own

consumer behavior choices (Carter and McGoldrick 1980). Recently, however, a declining economy, poor job opportunities, and divorces in early adulthood have contributed to an increasing proportion of young adults who take longer to "leave the nest". Recent U.S. census data indicate that 58% of single 20-24-year-olds live with their parents (Miner 1993). Only 40% of young adults ages 20-24 lived with their parents in the 1960s (Steinberg and Levine 1990). Of those aged 25-34, 11% have not left home or have returned, compared with 9% in 1960 (Steinberg and Levine 1990). This ambiguity in the end of the adolescent period highlights the great variability in individual developmental rates and outcomes, and points toward the nature of development as a lifelong process. Many of the developmental issues of adolescence continue, in either similar or related themes, into adulthood.

Risk and Opportunity in Youth Development

Much has been written in the popular and scientific literature about "youth-at-risk"; this usually refers to youth at risk of not having favorable developmental outcomes for success in adulthood. Several writers have described both risks to development and opportunities for development. Opportunities for development are present in social environments in which children have material, emotional and social encouragement appropriate for the needs of the child as he/she develops (Garbarino 1992). Bogenschneider et al. (n.d.) define a similar construct in "protective factors", those factors which promote a child's adaptation and competence. Risks to development (or risk factors) arise from both direct "threats" to the individual and from the absence of opportunities for development (Garbarino 1992). Bogenschneider et al. (n.d.) define risk factors as those individual or environmental hazards that increase a child's vulnerability to negative developmental outcomes or that increase the probabilities that the child will exhibit problem behaviors. Risk factors may be events or may be more or less permanent conditions in the child's environment (Garbarino 1992). Examples of biological risk factors include malnutrition or injury of the child; sociocultural risk factors include economic deprivation, or other

"impoverishment in the child's world of essential experiences and relationships" (Garbarino 1992).

Risk in a child's life is rarely absolute or static; the child's exposure to and vulnerability to risk factors changes over time (Garbarino 1992; Bogenschneider et al. n.d.). Most children can overcome one or two risk factors, but an accumulation of multiple risk factors tremendously threatens positive developmental outcomes (Garbarino 1992). In identifying multiple risk factors, Dryfoos (1990) has examined antecedents (events, conditions, sociodemographic characteristics and predisposing factors) to the following high risk behaviors: delinquency and acting out (anti-social behavior), substance abuse, early unprotected intercourse, and school failure or dropping out. Prevention interventions, then, would be aimed at these antecedents to the problem behaviors.

Many youth are at risk of negative developmental outcomes. When the overlap in risk behaviors among youth is considered, about 10% of teens can be considered "very high risk youth" who exhibit multiple problem behaviors; another 15% of youth are at "high risk", and display behaviors with lower frequency and somewhat less deleterious consequences (Dryfoos 1990). About 25% of today's teens might be considered at "moderate risk" – those who experiment with high-risk behaviors from time to time (Dryfoos 1990).

With these risks to the positive development of today's young people, it is easy to surmise that recreational involvement in activities such as fishing may be a low priority for families and young people just "struggling to get by". Constructive use of leisure time is certainly related to the risk and protective factors discussed above. Pittman (1991) and Dryfoos (1990) stress the need for intervention programs which are designed for families with young children, schools, after-school time, neighborhoods, and whole communities. One particular program makes use of the benefits of fishing in making more constructive use of one's leisure time and in avoiding high-risk behaviors; this program, called "Hooked on Fishing, Not on Drugs" encourages youth to spend time fishing with significant others such as concerned adults. It is implemented through schools and youth organizations, and consists

of video and print materials (including participation recognition via certificates and other materials). Fishing, with all of the benefits it provides, certainly could provide a great avenue for similar intervention-based programming to facilitate positive youth development.

Research Questions and Hypotheses Pertaining to Youth Development of Fishing

Involvement

III. RESEARCH QUESTION: What are the relationships between youth involvement in fishing and the individual's current involvement in fishing?

Hypotheses:

- Adult/current fishing involvement is dependent upon the individual's level of fishing exposure (activity and involvement) during childhood and teen years.
- Timing of childhood exposure, level of childhood fishing activity, and other factors such as family fishing activity interact cumulatively over the life span to affect adult fishing involvement. Some of these hypothesized interactions are shown in Table 2-3.

Table 2-3. Hypothesized relationships between family fishing socialization status, timing of fishing socialization (exposure), level of fishing involvement during youth and adult fishing involvement.

<u>Family Status of Individual</u>	<u>Was Exposure to Fishing Early or Late in Youth?</u>	<u>What was the Level of Fishing Involvement During Childhood and Teen Years?</u>	<u>Hypothesized Fishing Involvement in Adulthood</u>
From an angling family	Early	High	High
From an angling family	Early	Low	Moderate
From a nonangling family	Early (through nonfamily sources)	Low	Moderate
From a nonangling family	Late	High	Moderate
From a nonangling family	Late	Low	Low

Leisure Constraints

A Review of Leisure Constraints Research

Leisure researchers have traditionally focused on recreational participants and have investigated the reasons why people recreate. Recently, leisure service providers have broadened their efforts to include understanding and removing constraints to recreation for particular subgroups. In short, leisure constraints research aims to investigate the factors which inhibit or prohibit participation and enjoyment in leisure (Jackson 1991).

Various recreation researchers have arrived at useful typologies of participants and nonparticipants. Howard and Crompton (1984), using a marketing perspective, classify potential recreational client groups into two major groups: people who do not wish to participate in an activity (no activity demand), and people who do wish to participate (activity demand). This latter group can be divided into those who do participate (manifest demand) and those who would like to but do not take part (latent demand). Howard and Crompton argue that the latent demand group should receive the most attention from recreation programmers, and barriers which preclude participation for this group should be identified and eliminated. In another classification system, Jackson and Searle (1985) identify the following groups: former participants in an activity, participants who wish to increase participation levels but are unable to do so, and participants who are unable to achieve desired levels of satisfaction or enjoyment.

Several researchers have described constraints to recreational participation. Today, recreation constraints are defined more broadly than just as reasons why people don't participate; today's definition of barriers includes the reasons why people cease participation (Goodale and Witt 1989). A recreational barrier (constraint) is any factor which precludes or limits an individual's frequency, intensity, duration, or quality of participation in recreation activities (Ellis and Rademacher 1986). Goodale and Witt (1989), however, note that barriers to participation, to continuing participation, to ceasing participation and to increasing rate of participation are all slightly different constructs. A functional model of recreational

barriers, based on decision-making theories and models, describes blocking barriers (such as lack of interest and lack of knowledge) which preclude participation, and inhibiting barriers which limit participation levels (Jackson and Searle 1985).

Three major categories of recreational constraints have been described: 1) external barriers (environmental, economic, political or physical situation-specific barriers – such as lack of facilities); 2) internal barriers (psychological, intrapersonal or person-specific barriers such as lack of knowledge, opportunity, motivation, interest or skills); and 3) social and relational barriers (social=psychological, interpersonal barriers) (Jackson and Searle 1985, Goodale and Witt 1989).

External (environmental or structural) constraints to recreation include the quality and availability of physical resources (Ellis and Rademacher 1986). The quality of the recreational environment is determined by the extent to which it provides the opportunity for complexity, novelty and uncertainty (Ellis 1973). The availability of resources includes such factors as financial resources available for recreation, time available, and distance to be travelled (or recreational access). Numerous authors have studied these factors which were the early foci of barriers research (Ellis and Rademacher 1986). More recently, these types of barriers have been called structural constraints (Crawford et al. 1991).

Internal (personal or intrapersonal) constraints include the biological state (health condition, and other states) as well as the psychological condition of individuals (Iso-Ahola 1980). Psychological variables affecting recreational participation include personality and knowledge of leisure (Iso-Ahola 1980). Personality barriers include the absence of perceived freedom in leisure choices or activities, feelings of competence, and intrinsic motivation to recreate (Iso-Ahola 1980). Lack of knowledge and lack of accurate information on recreation opportunities pose barriers to participation (Mannell and Iso-Ahola 1985). To counter these effects, these authors argue that recreation professionals should increase information dissemination about recreation, should offer lifetime leisure education programs and should

encourage recreationist exposure to a variety of activities and experiences in order to positively increase their knowledge about such activities.

Interpersonal constraints to recreational participation are many and varied. Social norms and roles may serve to limit or preclude individual's participation in leisure activities (Ellis and Rademacher 1986). For example, some researchers have found that 34% of adolescents' leisure activities may be done due to some obligation or coercion (Csikszentmihalyi et al. 1977). Certainly, sex roles play an important part in affecting participation of women in nontraditional or "gender-differentiated" outdoor recreation activities such as hunting (Kelly 1987). "Significant others", such as parents, siblings, teachers, peers and recreation programmers, may have important influences on an individual's participation in leisure activities (Ellis and Rademacher 1986). Significant others may alter an individual's motivation to recreate from an intrinsic motivation to an extrinsic motivation (Iso-Ahola and Mannell 1985). A review of literature describing the relationship between play and creativity development found that too much control, directiveness and instruction by significant others will stymie creative growth of individuals and may provide a barrier to leisure (Bishop and Jeanrenaud 1985).

Frequently mentioned interpersonal constraints are those constraints due to family obligations. In all aspects of family life, there are many possible constraints on recreational participation; spouses influence spouses, parents influence children, and siblings may influence siblings (Iso-Ahola and Mannell 1985). Family-related factors including employment of spouses may limit recreation, while family size appears to increase participation (Holman and Epperson 1984). Families with very young children (under age 6) report more constraints to recreation than those with school age children over age 6 (Witt and Goodale 1981). Families with school-age children had less uncertainty about what types of activities to do, where opportunities were available, and how to utilize these opportunities, presumably because of the ease of communication about recreation through school and other community networks. On the other hand, the constraints of "not having enough time" and family

obligations increased sharply as children become older, then decline after adolescents are launched from the family (Witt and Goodale 1981).

The construct of constraints to recreational participation has been operationalized in various ways and from many different theoretical perspectives; in general, today's broader conceptualizations are more concerned with not just what people are doing or not doing, but with the social-psychological bases for their participation or nonparticipation. They cite an early quote from the ORRRC Reports: "the commitment of a person to an activity is related to the ratio between the input necessary to participate and rewards he perceives receiving as a result of participation" (Ferriss et al. 1962:5). In sum, Goodale and Witt (1989) conclude that unless at least two basic antecedents to leisure are met (intrinsic motivation and perceived freedom), some constraints are in operation.

A few researchers have developed synthetic models of recreation constraints and nonparticipation which include the mechanisms by which constraints interact with recreational preferences to affect participation (Crawford and Godbey 1987). These researchers investigated "antecedent constraints", or factors which affect individual's leisure preferences. Others focused their efforts on "intervening constraints", those intrapersonal and interpersonal factors which affect an individual's ability to participate once a leisure preference has been defined (Jackson 1991). With more complex models of how constraints operate, there has been growing recognition that the relative importance of certain constraints varies across populations and that the perceived strength of constraints varies according to the type of activity under consideration (Jackson 1991).

One recent work consists of a nested model in which leisure participants confront a series of hierarchical constraints (Crawford et al. 1991). The major contribution of this work is to propose that recreation participation is actually a dynamic process whereby people negotiate a series of constraints through to participation and beyond to continuance or even specialization. They demonstrate that the first constraints encountered are at the intrapersonal level (Figure 2-6). These constraints (such as prior socialization, psychological

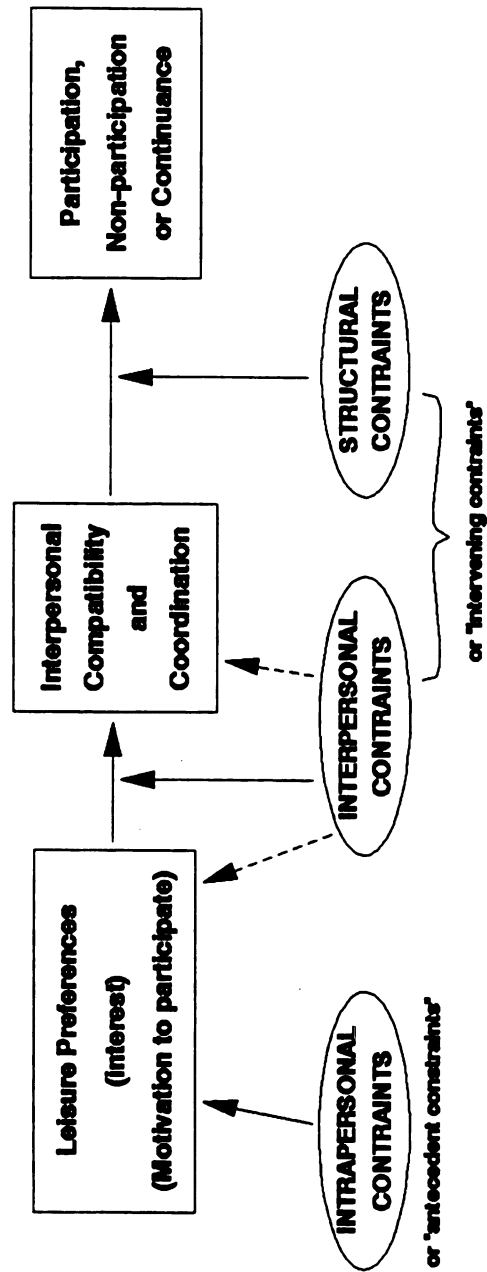


Figure 2-6. Hierarchy of leisure constraints (Crawford, Jackson and Godbey 1991).

orientations toward the activity) affect the formation of leisure preferences which set the stage for further participation. Next, the individual encounters interpersonal constraints; these constraints are particularly relevant in activities where participation with others is common or necessary. If these constraints are negotiated adequately and the activity is interpersonally compatible, then the individual may encounter structural constraints such as lack of financial resources, lack of opportunity or time.

Using this model, Crawford et al. (1991) arrived at three propositions:

- 1) leisure participation depends upon a process of negotiating through sequential factors or constraints (i.e. past history of an individual is an important influence on participation);
 - 2) this sequential ordering of constraints represents a hierarchy of importance (and that intrapersonal constraints on leisure are the most influential on motivation for participation);
 - 3) social class influences participation (i.e. highly educated and high income individuals are subject to few or weak inter- and intrapersonal constraints)
- (Crawford et al. 1991:315).

An example of hierarchical constraints is the situation faced by a beginner in a recreation activity (Stebbins 1979). Early on, a beginner is faced with high-level or even professional standards; at that point, the beginner must decide whether to maintain a "dabbler" status, or to begin the process of more advanced learning and skill development. At this critical decision point, some individuals will decide not to specialize in the activity, while some who wish to specialize may be constrained by intrapersonal factors. If those factors are overcome, the individual next encounters the interpersonal challenges of finding partners at the same skill/specialization level with whom to participate. Finally, structural constraints of increased cost for equipment, or lack of specialized talent or skill remain to be negotiated for further specialization.

Huston and Ashmore (1986) argue that "psychological orientations", intrapersonal constraints which may predispose individuals to behave in certain ways, consist of: a) beliefs a person has about what he/she ought to do, b) what the individual likes or wants to do, and c) the extent to which the individual has the competence/ability to do that activity. These subjective evaluations may prevent individuals from even testing the extent "higher order" interpersonal or structural constraints exist (Crawford et al. 1991). Thus, individuals who experience negative psychological orientations toward an activity are more likely to report intrapersonal constraints as barriers to participation, whereas individuals not affected by such orientations are more likely to report the "higher order" constraints as deterrents to participation (Crawford et al. 1991).

Few studies have examined questions related to participation constraints for fishing or for hunting. Applegate (1989) conducted a study of former hunters and found that the most frequent reasons why these individuals did not purchase a license in 1981 included: "other things that I like better" (an interpersonal constraints); "too many other hunters" (an intrapersonal or structural constraint); and "no good hunting places" (a structural constraint).

One recent indepth study integrates both classification of constraints and of participants and nonparticipants into a more complete picture of recreational involvement. Wright and Goodale (1991) developed and validated a classification system which demonstrated that hunters, former hunters, and hunting nonparticipants differ with respect to constraints to their hunting participation. Nonparticipants were significantly older than hunters and former hunters, and frequent hunters interested in participating more were the youngest. Nonparticipants interested in hunting more often most frequently reported constraints of lack of access and costs of hunting. Uninterested nonhunters more frequently reported an anti-hunting attitude and preference for other activities. These researchers suggested that the unavailability of hunting opportunities as a child was an important antecedent to low hunting interest and participation as an adult. These authors concluded that:

- 1) this segmentation on the basis of interest and participation/nonparticipation and the investigation of effects of constraints on both participants and non participants are of theoretical and practical significance;
- 2) interest in participation is a meaningful variable for segmentation;
- 3) there is a relationship among attitudes, interests, preferences, and participation/nonparticipation (Wright and Goodale 1991).

The segmentation approach used by Wright and Goodale (1991) presents a useful way in which to interpret a recent research effort by Harrington Market Research and AFTMA (1990) investigating fishing involvement. This study consisted of a national survey of anglers, ex-anglers and nonanglers; the proportions of respondent in each of these categories varies (Table 2-4). In investigating the proportion of anglers interested in increasing their fishing participation the researchers found that, across all angler groups, about 80% of anglers want to go fishing more often. These researchers defined drop-outs as all anglers who used to fish more often, and found that 74% of dropouts are infrequent anglers. These researchers, however, were not clearly able to estimate latent demand for fishing among ex-anglers and nonanglers. They did, however, note that one-third of ex-anglers had been fishing within the last 2 years. In segmenting ex-anglers from nonanglers, these researchers relied solely on self-classification by respondents rather than behavioral criteria; these investigators admitted that, of non-anglers, an unknown proportion had tried fishing—and that more research is needed.

Table 2-4. Angler and nonangler types in a national marketing survey (Harrington Market Research and AFTMA 1990).

Category	Fishing operationalization	% of all people	% of respondents in that group
Heavy fishing participants	fished 20+ days in that year	13.3	37% of anglers
Medium fishing participants	fished 6-19 days in that year	10.1	28% of all anglers
Light fishing participants	fished 1-5 days in that year	12.2 (all anglers = 36% of people)	34% of all anglers
Ex-anglers likely to fish again	did not fish in that year	9.2	84% of ex-anglers
Ex-anglers not likely to fish again	did not fish in that year - self-reported as "ex-angler"	1.2 (all ex-anglers = 11% of people)	11% of ex-anglers
Non-anglers	did not fish in that year - self-reported as "non-angler"	53%	

Two studies specifically investigated constraints to fishing participation. In an exploratory study using personal interviews with 42 Lake Ontario salmonid anglers, these anglers were asked what factors would influence the amount of time spent fishing, why they stopped fishing during some periods, and what factors influenced their participation over the years. A wide array of responses were received, and classified into four categories of constraints: change of interest, lack of time, dissatisfaction with aspects of the activity, and uncontrollable forces (Siemer et al. 1989a). The most frequent specific response included: time commitments due to a new job, distance to Lake Ontario, less social contacts due to relocation, lack of access, bad weather, family time commitments, and military service (Siemer et al. 1989a). While not frequently mentioned as constraints, the factors of water pollution, toxics in fish, and overcrowding on Lake Ontario were mentioned by several interviewees.

Another study investigated responses to the open-ended question "What has prevented you from fishing more often in Texas?" among respondents to a statewide sample of licensed, resident anglers in Texas (Ritter et al. 1992). Responses were classified into the following categories of constraints (listed in the order of frequency of mention by anglers): time, access, management, economics, interest, ability, and social. Lack of time due to work, family and school obligations were mentioned as constraints by nearly 75% of anglers. Access was mentioned by about 15% of anglers, while economics and management constraints (fishing regulations and not enough fish) were the next most frequent categories (Ritter et al. 1992). These researchers call for further work in refining the categories of constraints and applying them in other studies (Ritter et al. 1992). Management implications of angling constraints research are that fisheries agencies can better understand the uncontrollable constraints such as lack of time and some economics factors in predicting fishing involvement, and that agencies can manipulate such "controllable" management factors as access, facilities and services for both participants and nonparticipants (Ritter et al. 1992).

The greatest values of leisure constraints research lie in the improved ability of recreation programmers to "target market" their offerings to particular groups of people (Jackson 1991). Crawford et al. (1991) suggest that one of the greatest future research needs is the need for better understanding of "antecedent constraints" (i.e. intra- and interpersonal constraints). They cite a need for exploratory research using qualitative methods to describe the processes by which antecedent constraints operate. They also support more research which focuses on the breadth of constraints rather than on one particular category of constraints. In general, leisure constraints research findings can contribute to more effective programming at several distinct "levels": program philosophy, policy, planning, and marketing (Jackson 1991). More specifically, with better information on the factors which affect participation, programmers can address the following issues:

- 1) What constraints are affecting participation?

- 2) Is the delivery of programs adequate, or do gaps in delivery present barriers or constraints to participation?
 - 3) Which constraints are best influenced by programmers, and which are beyond their influence?
 - 4) Are particular subgroups of people at any disadvantage because of particular constraints?
 - 5) What strategies can programmers use to alleviate effects of certain constraints?
- (Jackson 1988).

Research Questions and Hypotheses Pertaining to Constraints to Fishing Involvement

- IV. RESEARCH QUESTION: How do recreational constraints influence expression of fishing involvement in teens and adults?

Hypotheses:

- Intrapersonal, interpersonal and structural/physical constraints in the teen years are related to fishing participation in teens.
- Constraints intervene between attitudinal measures of commitment and actual fishing behavior such that adults with low fishing involvement have higher mean constraint scores than do high or moderate involvement anglers.

Stewardship and Recreational Participation

The Construct of Environmental Stewardship

Environmental educators have long held to the goal of developing environmental stewardship among their audiences. In fact, the superordinate goal for environmental education is:

"to aid citizens in becoming environmentally knowledgeable and, above all, skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of environment" (Hungerford and Peyton 1980:3).

There has often been an assumption on the part of environmental educators and recreation researchers that a relationship exists between outdoor recreation participation and attitudes toward the environment (Jackson 1989). In fact, only a small body of literature has dealt with this relationship; furthermore, this causal relationship may be reciprocal — participation in outdoor recreation may increase as a result of increasing environmental awareness and concern; on the other hand, participation in outdoor recreation can contribute to increasing environmental awareness and concern (Jackson 1989). Therefore, studies which have been done need careful scrutiny.

Early literature frequently suggested that increasing participation in outdoor recreation was directly responsible for the emergence of the environmental movement and the increasing environmental concern among the public in the late 1960s and 1970s; this literature base prompted Dunlap and Heffernan (1975) to investigate these relationships. They hypothesized that this effect was observable at the societal level since participation in outdoor recreation

"creates an awareness of environmental problems by exposing people to instances of environmental deterioration; creates a commitment to the protection of valued recreation sites; and... cultivates an esthetic taste for a 'natural' environment which fosters a generalized opposition to environmental degradation (Dunlap and Heffernan 1975:18)."

Several authors have considered and investigated the factors leading to increased stewardship among resource user groups or education audiences. Several different operational definitions of "stewardship" or "vested interest" have resulted. Some authors define these behaviors as "commitment" (Arbuthnot 1977, Borden and Schettino 1979). Although these authors defined environmental commitment differently, they have observed positive relationships between environmental knowledge, positive attitudes toward environmental problems, and personality factors and "environmental commitment" as measured by taking a responsible action such as recycling. Other researchers have investigated relationships between these antecedent variables and "environmental concern" (Constantini and Hanf 1972, Dunlap and Heffernan 1975). Several researchers and environmental educators have studied the effects of educational programs on development of "conservation behaviors" such as anti-littering campaigns (Asch and Shore 1975, Weigel and Weigel 1978, Werling 1979). Werling (1979) found that outdoor instruction led to greater gains in environmental knowledge than indoor instruction. He also found that knowledge gain was not related to demonstration of conservation behaviors, but noted that more refinement was needed in unobtrusive measures of such behaviors.

Recently, researchers have recognized the importance of measuring "environmental concern" as a surrogate for "stewardship" along with the measurement of specific behaviors. Gigliotti (1992) investigated college students' concern for environmental problems and their willingness to make changes in various lifestyle behaviors. He stresses that environmental education programs must contain messages that stress the connection between lifestyle choices and current environmental problems. Another study, conducted by the Roper Organization around the 20th anniversary of Earth Day (1990) also included variables assessing environmental concern (attitudinal measures of importance of various environmental problems) as well as variables on various household consumerism practices and political action. By far, most studies, such as Larson et al. 1981, focus attention on relationships between antecedent variables (including environmental concern) and

consumerism or political action. Few investigate the relationships between antecedent variables and other categories of actions described by Hungerford and Peyton (1980) such as: persuasion, legal action, or ecomanagement (or "stewardship") actions .

Particularly is the work by Dunlap and Heffernan (1975) investigating the association between participation in outdoor recreation and concern for protecting aspects of the environment necessary for pursuing that recreational activity. These researchers developed a scale of 8 indicators of environmental concern, all of which reflected attitudinal support for funding for environmental quality goals. Two of these items were more closely related to recreation issues (Jackson 1989). Dunlap and Heffernan (1975) found:

- 1) a weak positive association between outdoor recreation involvement and environmental concern;
- 2) a stronger association between participation in "appreciative" activities (hiking, camping) and environmental concern than between "consumptive activities" (fishing, hunting) and concern;
- 3) involvement in outdoor recreation was more likely to be associated with a concern for protecting aspects of the environment necessary for recreation than between outdoor recreation and other more general environmental issues such as controlling pollution.

These researchers go on to recommend further research be conducted on the contribution of outdoor recreation to "environmental concern".

Other researchers soon patterned their studies after the Dunlap and Heffernan study. Geisler et al. (1977) found that socioeconomic variables (age, income, education) were more strongly related than outdoor recreation participation to environmental concern. They did, however, conclude, that "at most it can only be said that particular forms of outdoor recreation are related to particular environmental concerns at particular times and places" (Geisler et al. 1977: 248). Among these follow-up studies, considerable debate emerged over operationalization of the construct "environmental concern". Critics of a study by Pinhey

and Grimes (1979) argued that their measures of concern were "highly specific and localized" and "extremely poor" (Jackson 1989: 364).

In 1981, a new scale, the "New Environmental Paradigm" (NEP) scale, was used by VanLiere and Noe to address questions about the relationship between recreation and environmental attitudes. The major evolution in operationalization was to measure environmental attitudes in a broader "worldview"; now, respondents were asked "to express their general orientation toward the environment rather than awareness or concern about specific environmental problems" (VanLiere and Noe 1981:509).

Using the NEP, VanLiere and Noe (1981) found only mild associations between outdoor recreation and environmental attitudes; they concluded that the linkages among these variables might be more complex than previously assumed. Further research is needed to propose more complex models and identify

"those influences which might cause individuals to interpret their outdoor experiences in a manner that creates awareness and concern about the environment and causes them to manifest that concern in their actual behavior (VanLiere and Noe 1981: 511-512)".

More specifically, they suggest including the variables of recreation socialization during childhood, membership in environmental organizations, and environmental attitudes of the social group with which the recreational activity is shared (VanLiere and Noe 1981: 512).

Other researchers have described in detail the antecedents to "responsible environmental behavior". Perhaps the most useful model of factors leading to responsible environmental behavior is posed by Hines, Hungerford and Tomera (1986/1987), who reviewed many environmental education studies using a meta-analysis technique. Their goal was to determine the variables most strongly related to the development of responsible environmental behaviors.

Environmental sensitivity has been observed to be a major "entry-level" or antecedent variable predisposing an individual to responsible environmental behavior (Hungerford and Volk 1990). Environmental sensitivity is defined as "an empathetic

perspective toward the environment" and is developed through an individual's direct contact with the outdoors either alone or with close relatives or personal friends, often while hunting, fishing, or participating in other outdoor activities (Hungerford and Volk 1990). Petersen (1982) found that participation in outdoor experiences and presence of role models were significant factors leading to environmental sensitivity and a predisposition for responsible environmental behavior. Likewise, Sia et al. (1985/1986) found that the majority of variance in predicting environmental behavior was explained by individuals' level of environmental sensitivity, environmental action skills, and knowledge of environmental action strategies. Further investigation is needed of the contribution of factors to development of this "sensitivity".

Two studies have related fishing involvement and the individual's commitment to and action toward the environment. Katz (1981) contacted a sample of 400 members of the Theodore Gordon Flyfishers and Trout Unlimited and assessed angler involvement (activity level), broad environmental concerns, and attitudes toward fisheries issues. Involvement was measured using a 20 item scale which assessed years of angling and flyfishing experience, "specialized" activities (such as international travel and saltwater flyfishing, flytying, leader construction), non-angling actions (such as participation in stream improvement and water quality monitoring, letter writing), and property ownership near fishing opportunities. The Broad Environmental Concerns Inventory consisted of a 20-item Likert-type scale assessing attitudes toward air and water pollution, endangered species, human population growth, development, recycling, and other concerns. He found that as activity involvement increases, anglers hold more favorable attitudes toward broad environmental concerns. The mechanism for this relationship is most probably that as flyfishing expertise increases, knowledge about the resource increases, catalyzing the linkage between flyfishing and concern for the resource (Katz 1981). In another study, Kellert and Westervelt (1983) found that children who were anglers were more knowledgeable about wildlife, showed greater appreciation and

concern for the resource, and showed less sentimental affection and fear toward wildlife than non-anglers.

Fishing, and responsible stewardship behaviors toward the fisheries resource and aquatic ecosystems, then, present an opportunity to investigate the dynamics presented in the Hines model. Fishing is a specific environmental activity, in which youth may have (or lack) opportunities for outdoor experiences and for interaction with various role models. It also presents an attractive tool for capturing youth interest in and about fisheries resources. With these points in mind, it presents an ideal research vehicle for investigating the factors which help individuals develop stewardship behaviors.

Research Question and Hypotheses Pertaining to Environmental Stewardship of Anglers

VI. **RESEARCH QUESTION:** What are the relationships between early fishing socialization, degree of fishing involvement and the frequency of environmental stewardship behaviors?

Hypotheses:

- Anglers demonstrate environmental stewardship behaviors more frequently than the "American public", particularly those behaviors related to aquatic stewardship activities.
- Individuals with higher angling involvement do environmental stewardship activities more frequently than moderate or low involvement anglers.
- Anglers with more numerous family exposure agents to fishing exhibit environmental stewardship behaviors more frequently than those without such socialization agents.

CHAPTER 3

METHODS

Overview

No comprehensive study of anglers specifically addressing the factors which influence youth recruitment has been conducted in the past. Within the angler ranks are people with wide variance in both fishing exposure variables and in outcome variables such as fishing participation levels and attitudinal commitment or loyalty to fishing. For these reasons, and since it is difficult to obtain comparable samples of nonanglers and anglers, the research design for this study focuses on existing anglers.

This study was conducted in four separate phases: I) Focus Groups - exploratory, qualitative phase; II) Pilot Survey; III) Full Mail Survey; IV) Non-Respondent Follow-up Telephone Survey.

Phase I - Focus Groups

Definitions and Uses of Focus Groups in Research

Focus groups are unstructured group interviews conducted using open-ended questioning structures to obtain qualitative, descriptive information about a given topic (Dillon et al. 1987). The interaction among the group participants encourages them to be comfortable and talkative in response to both the facilitator (the person leading the focus group) and to each other (Greenbaum 1988). The elements of a focus group include: the facilitator, multiple respondents, interaction among the respondents, and the use of a discussion outline (Greenbaum 1988).

Typically, focus groups are used in the early, exploratory phases of research to generate new ideas, gather input from consumers, identify and understand consumer vocabulary or language, uncover basic consumer needs and attitudes, generate new ideas

about new products or established markets, and to interpret previously obtained quantitative data (Dillon et al. 1987). Focus groups are used to define problems, to provide background information, to formulate hypotheses, and to generate wording for later use in quantitative studies (Green et al. 1988). Focus groups are not used to provide solutions or conclusions about all consumers, but to identify the range and complexity of consumer concerns (Green et al. 1988). Results from focus groups are not generalizable across large populations (Greenbaum 1988).

Groups are usually composed of 6-12 willing members of a target market who are homogeneous in relation to certain relevant characteristics (Dillon et al. 1987, Green et al. 1988). They are specifically recruited using criteria important in the purpose of the study, but are not briefed in detail concerning the specific nature of the study prior to participating (Dillon et al. 1987, Green et al. 1988, Greenbaum 1988). Several groups are conducted to counteract the possibility that the dynamics of one particular group will cause misrepresentation or misinterpretation of the group's output (Dillon et al. 1987). The quality of the results of focus groups depends on the effectiveness of group member screening, the effectiveness of the presentation of concepts for discussion, and qualities of the facilitator (Greenbaum 1988). For these reasons, it is important to carefully select and train facilitators, give attention to screening criteria and procedures, and to develop a discussion guide for use in the focus groups. This discussion guide should include topics to be discussed, directions for facilitators, and ideas for probing questions (Greenbaum 1988). Groups are usually videotaped or audiotaped, and transcripts analyzed to provide insight into further, perhaps more quantitative studies.

Developing a Research Design: Objectives and Procedures for Fishing Focus Groups

During this phase, focus groups provided qualitative information for use in further refinement of the research design for the full study. This type of qualitative research was also needed to supplement findings from self-report surveys on barriers to recreational

participation (Goodale and Witt 1989). Focus groups with anglers of varying fishing involvement levels were designed primarily 1) to determine whether the full study should include nonanglers as well as anglers (as in a case-control study); 2) to ascertain which fishing exposure variables were pertinent to include in this study; 3) to identify language anglers and nonanglers use to describe fishing experiences (in order to develop more valid questionnaire wording for the quantitative study phase); and 4) to determine the level of recall of anglers and nonanglers about early fishing exposures. In particular, the focus group discussion guide was designed to elicit information to help operationalize the conceptual basis and measurement (survey) wording for the dependent variables of fishing involvement.

Specific objectives for the focus group phase of this research were to:

- provide an exploratory look at fishing recruitment processes and constraints to participation;
- elicit language which participants use to describe sources and processes (nature) of recruitment (early fishing exposures) and of fishing involvement;
- determine salient elements (experiences, socialization agents, etc.) of fishing recruitment;
- determine the level of recall of early fishing experiences for young adults vs. adults;
- determine importance of primary (1st time) events vs. continuing patterns in early fishing exposures in influencing whether a person becomes a highly-involved angler; and
- identify those variables for inclusion in the angler survey which can help resource managers readily target/segment prospective anglers and which managers can affect to influence recruitment and retention in fishing.

Focus groups were conducted in waves; the overall intended design of focus groups is shown in Table 3-1. First, two focus groups were conducted with undergraduates from non-major fisheries and wildlife courses (FW 203, FW 305 and FW 207) at Michigan State

University. Students were contacted by personal visits to the classroom, and dissemination of a screening survey to be completed and handed in to the investigator. Potential participants were screened to be sure that one focus group would consist of some persons with higher levels of fishing participation, and the other group would consist of low-level fishing participants or non-anglers. In this first wave, facilitators (two graduate assistants) received training, experience and feedback in conducting focus groups. High level fishing participants responded on the screening survey that they "buy a license and go fishing every year," whereas low level participants either responded that they "buy a license and go fishing once or twice every few years" or that they "have only tried fishing a few times and are not really active anglers right now." In the resulting "Involved Anglers" Student group (Table 3-2), members all had high fishing participation levels, were interested in fishing more often, and rated fishing as a very or somewhat important activity compared with all other recreation activities. In the "Less Involved" Student group (which consisted of only 3 members), members had low levels of fishing participation and rated fishing as a "not very important" recreation activity.

Due to a number of factors, the desired design was not achieved for even the preliminary focus groups with students. Students were difficult to contact and to recruit, since the timing of phone calls was near the midterm exam period of Spring Term. Low involvement students who had completed the screening survey in class were less interested than involved students in arranging their evening schedules to participate and were particularly difficult to recruit, in spite of providing the incentive of a pizza dinner for student groups. The final design of focus groups is shown in Table 3-2. In spite of the difficulty of convincing low-level fishing participants and nonanglers to take part in focus groups, the students (most of whom were anglers at some level) provided an adequate diversity of responses to questions. Thus, the remaining focus group members were selected from a sampling frame of fishing licensees.

In the second wave of focus groups, a sample of Michigan anglers licensed to fish in 1991-92 living within one-half hour of East Lansing was drawn by the Michigan Department of Natural Resources. (Towns, cities and zipcodes determined to be within 1/2 hour of East Lansing included Lansing, Mason, Haslett, Bath, East Lansing, Okemos, DeWitt, Grand Ledge, St. Johns, Holt, Dimondale, Williamston, Dansville, Eaton Rapids, Charlotte, Potterville, Laingsburg, Perry, Shaftsbury, and Webberville.) The design called for drawing a sample of 140 persons age 23 or older, and another 140 persons under age 23 (for comparison with students). Phone numbers were secured for as many persons as possible, and potential focus group members were screened using a telephone screening survey (Appendix II). The goal was, for each age strata, to secure participation from enough participants for a "high" fishing participation focus group and for a "low" or no participation focus group. Within each group, it was desired to have a mix of people from various geographic locations (rural, suburban and urban), a mix of males and females, and a mix of interest levels in fishing. The goal was to conduct 6 focus groups with approximately 8 participants per group. This design is summarized in Table 3-1.

Table 3-1. Design of angler focus groups.

Sampling frame	Less Involved Anglers	Involved Anglers	Number drawn
Students < age 23 (FW 203, FW 305, FW 207)	8 people (Facilitator #1)	8 people (Facilitator #2)	As many as will volunteer
Younger licensees* (most recent passbook year available within 1/2 hour of Lansing) < age 23 (birth date 1969 or later)	8 + 1 (overscreen by 1) (Facilitator #2)	8 + 1 (overscreen by 1) (Facilitator #1)	140
Older licensees (most recent passbook year available within 1/2 hour of Lansing) > age 23 (birth date before 1969)*	8+1 (overscreen) (Facilitator #2)	8 + 1 (overscreen) (Facilitator #1)	140

* = Resident Annual Fishing licensees in 1991-92.

Again, the desired number of participants and the general design for the focus groups were not achieved. Although an incentive payment of \$35 was offered to potential angler participants, these individuals were difficult to recruit. Phone screening calls were placed to anglers beginning on May 4, 1992, just as the weather was becoming more favorable and as softball leagues and other community events were starting for the season. While there were few refusals for either the phone survey or focus groups, a large proportion of individuals were not reachable (Table 3-3). Only 123 (not 140) young anglers could be drawn from the MDNR list of licensees within the East Lansing area. Young anglers age 23 and under were particularly difficult to contact via phone and seemed more forgetful regarding arrangements for participating. After initial contact was made via the phone screening survey, a follow up letter with a map to campus was mailed to individuals agreeing to participate. Then, the night prior to the focus group, a reminder phone call was placed to most people who had agreed to participate. The final design, then, consisted of 5 focus groups conducted with 24 individuals (7 of whom were females) (Table 3-2).

Table 3-2. Resulting focus group design.

Group I Involved Anglers - Students conducted Apr. 15, 1992 6 members (1 female) Facilitator #1	Group II Less Involved Anglers - Students conducted Apr. 21, 1992 3 members (2 females) Facilitator #2
Group III Mixed Involvement Young (ages 17-23) Anglers conducted May 12, 1992 5 members (1 female) Facilitator #2	
Group IV Involved Older (>23 years) Anglers conducted May 13, 1992 5 members (1 female) Facilitator #2	Group V Mixed/Low Involvement Older Anglers conducted May 13, 1992 5 members (2 females) Facilitator #1

Table 3-3. Contact and non-contact breakdown on focus group telephone screening survey (anglers only).

Result of contact effort	Anglers older than 23 years	Anglers 23 years and less
Unavailable or unlisted phone numbers	52.2%	52.0%
"Not at this #"; "# disconnected"	10.9%	11.6%
Didn't buy license; hang-up	4.4%	3.3%
Out of state or moved away	0	4.1%
Unreachable - no answer	11.6%	9.1%
Successful contact	8.7%	9.1%

Results of Fishing Focus Groups and Implications for Phases II, III
(Design of Full Mail Survey)

Focus groups were audiotaped, and the tapes were transcribed by Office Services at Michigan State University. The discussion guide used in conducting the focus groups and a profile of focus group participants are included in Appendix II. A summary of results from the focus groups is presented here.

In general, recall by focus group participants of early fishing experiences was very good; there appeared to be no difference in the level of detail of events recalled by younger (under age 23) persons vs. older (over 23) anglers. In all groups, participants generally recalled their "earliest fishing experiences" in adequate detail to describe particular events; only a few members of both low and high involvement groups recalled their very first fishing experience.

Several areas of discussion within the focus groups provided insight into structuring valid survey items in the language used by anglers. In particular, most focus group members spoke of their current fishing participation levels in terms of frequency of fishing by season of the year (i.e. "I fish every weekend in the summer, but only once or twice per month during icefishing season in winter"). A series of survey measurement items constructed to reflect seasons of the year would be more valid than the single item "How many days per year do

you fish?" Participants also commented on other behavioral indications of fishing involvement such as vacation-taking behaviors, specific fishing trips (i.e. to Canada), fishing at a cottage or cabin site "up north" in Michigan; these results indicated that "involvement" should be operationalized as more than just frequency of fishing participation per year. Many other discussion results from the focus groups aided in identifying the range of response categories which were necessary in survey questions. For example, as sources of exposure to fishing, focus group participants cited fathers, brothers, cousins, uncles, grandparents, neighbors, friends of family members, and peers. Participants also described a range of both positive and negative exposure incidents (such as the fish pulling the pole out of one's hand, getting stuck with a fish spine, falling in, playing in "worm dirt"). These results suggested questionnaire response categories which would increase the content validity of the survey instrument.

In exploring the salient factors influencing recruitment (early exposures) to fishing and in examining recruitment processes, it appeared that most anglers (in both low and high involvement groups) had experienced a mix of both positive and negative exposure events. Other negative events mentioned included: looking down in water and considering how deep and dangerous it is, getting knots or tangled line, losing things such as lures, seeing dying fish, getting motion sickness, getting caught with the hook, getting "skunked", fighting bugs and weather. Positive experiences mentioned included a variety of hands-on experiences such as handling worms or other bait, handling the fish, enjoying the peace, calm, tranquility of a particular site, enjoying "unity with" family members, the excitement of a catch, eating the catch, or enjoying a social event. Since anglers with both high and low involvement in fishing experienced a wide array of negative early experiences, this led to a question for further research: is it the absence of positive early experiences (rather than the presence of negative experiences) which most influences future participation in fishing?

In examining the importance of early patterns of fishing and their influence on later fishing involvement, one focus group member's statement stands out: "The more fish you

catch, the more times you want to go." Others' statements were similar. It appears, then, that repeated exposures with successful or satisfying outcomes (e.g., catching fish at an early age) are important in developing long-term involvement to fishing. Very early exposure also seems to contribute to development of involvement; one participant stated, "It just seems to me like I always fished." Other focus group members commented on being interested in "everything" when young children. This set of discussion results indicates the need for inclusion of satisfaction measure(s) to assess outcomes of early fishing exposure in childhood.

Numerous constraints to fishing participation were mentioned by both low and high involvement anglers. These included access to transportation, problems getting bait or in "knowing what to use", losing "fishing buddies", costs of charter fishing, the image of fishing as an older man's sport (perpetuated by the media), college, family, work or other obligations, and not being "a morning person". Some of these factors which acted as constraints for some individuals served as positive influences for others; for example, young male adults indicated that obtaining a driver's license and/or car increased their opportunity for fishing. Others reported that new circles of friends (for example, at work) increased their fishing activity. The extensive discussion by focus group members on barriers and incentives to fishing participation confirmed that measurement of these factors would be important for better understanding the underlying relationships between attitudinal commitment to fishing and actual fishing activity levels.

While many more implications for understanding the phenomenon of fishing recruitment can be drawn from the results of these focus groups, this brief review of results shows both the importance of beginning with an exploratory research phase and of examining the language and scope of anglers' experiences. These results were used in designing the next phase of this research project – the pilot survey phase.

Phase II - Pilot Survey

A pilot survey is an important phase of survey research; it is during this phase that the survey instrument is developed and tested. The pilot phase allows the researcher to examine whether there may be confusing or ambiguous questions in the survey (Sudman 1983), which would present threats to reliability and validity of variables the researcher desires to measure. Since a retrospective methodology was used in this study, validity and reliability of information recalled are important issues.

Design of Measurement Items and Measurement Models

Measurement is the assignment of numbers to observed phenomena according to certain rules (Bohrnstedt 1983). These rules determine what kinds of mathematical operations can be used on the measurements (Anderson et al. 1983). A measurement model is the formal operationalization of constructs in terms of observable values (Hunter and Gerbing 1982). Since observed values are never perfect and are only indirect estimates of constructs of interest, there must be an accounting of the nature and degree of error in the observed values (Hunter and Gerbing 1982). Confirmatory factor analysis (CFA) is one method for such analysis of measurement models.

The pilot survey instrument was developed to address several key variables thought to affect long-term fishing involvement. These variables and the relationships among them can be described using a consumer socialization model which includes antecedent variables (such as social structural variables of sex, urban vs. rural residence as a youth, and time of first exposure to fishing), fishing socialization variables (such as parental fishing activity, type of early fishing exposures, pattern of early fishing participation), and outcome variables (including attitudinal and behavioral involvement in fishing as an adult, and environmental stewardship practices) (Figure 2-4). Measurement items and scales were constructed using insight gained from focus groups and using items and scales from other studies. Measurement scales constructed included: fishing benefits sought, attitudinal fishing

commitment, childhood fishing involvement, teen fishing involvement, and environmental stewardship. The pilot survey was reviewed numerous times for content and face validity by 2 other researchers.

All of the multiple-item scales were Likert-type scales, with items for which respondents were asked to indicate their extent of disagreement or agreement. The assumptions of Likert scales are that: (1) there is a continuous underlying attitude dimension and that each item is monotonically related to that continuum (i.e. a favorable attitude produces a high score on each item); (2) the sum of the item scores is monotonically related to the attitude (i.e. a high total score indicates a more favorable attitude); (3) the sum is a linear function of the individual items equally weighted; and (4) there is a single common factor (i.e. the scale measures only one underlying common attitude) (Anderson et al. 1983). The stages of constructing and analyzing a Likert scale are:

- a) to select items from the theoretical universe of potential attitude statements using a theoretical understanding of the attitude to be measured;
- b) to pretest the items and
 - 1) discard any items without any variation across respondents,
 - 2) examine the correlation between each item and the total score and discarding any items with low correlation,
- c) to compute the scale reliability, and delete any items which diminish the scale reliability, and
- d) to test the unidimensionality of the scale using factor analytic techniques (Anderson et al. 1983).

These procedures were used in this study. A discussion of the use of CFA for assessing measurement models and a description of the theoretical bases of the multi-item measurement scales follow.

Confirmatory Factor Analysis in Assessment of Measurement Models

Confirmatory factor analysis (CFA) is one method for assessing a measurement model which specifies the relationship between theoretical variables (constructs, "true scores", or factors) and observed variables (items, indicators) used to measure constructs. A measurement model with a set of unidimensional scales is called a multiple groups model. The steps used in CFA of a multiple groups model are: 1) to construct the model by writing items and specifying their relationships to constructs; 2) to estimate the values of parameters of the model from observed correlations in data collected; and 3) to evaluate the measurement model in terms of the fit of the model to the data, by comparing the observed correlations among the variables with those correlations predicted by the model (Hunter and Gerbing 1982). This third step is considered construct validation.

The measurement model is first constructed by selecting groups of items which are related according to underlying theoretical relationships. Next, measurement items are written. Items should be worded such that they will discriminate between individuals in the sample (i.e. that there will be variance among responses) (Hunter and Gerbing 1982).

Next, CFA is used to estimate parameters of the measurement model. Parameters are summary characteristics of a population, whereas statistics are characteristics of a sample (Fink and Monge 1985). The parameters of importance in CFA are:

- 1) factor pattern coefficients - the regression weights of the observed variables on the corresponding latent variables (constructs) in the model. Since in a multiple groups model each observed variable is generated only by a single factor, there is only one number in the factor pattern of each item – the correlation between the item and the factor it measures.
- 2) factor-factor correlations - used in subsequent causal analysis procedures.
- 3) communalities - the hypothetical correlation of an item with another item of the same reliability. If the multiple groups model fits the data, then the communality is equal to the square of the factor pattern coefficient.

- 4) **factor loadings** - a matrix of the correlations of each observed variable with all of the factors in the model. This matrix is then used to test the fit of the measurement model to the data (Hunter and Gerbing 1982: 273-274).

Communalities are used in CFA in the diagonal of the observed correlation matrix so that the parameters of the model are based on cluster true scores – those scores which would be obtained if the construct was measured without error. Thus, the use of communalities corrects for attenuation and eliminates the effect of error of measurement from estimated item-factor and factor-factor correlations (Hunter and Gerbing 1982). These estimation procedures and subsequent evaluation of the model are used in the software packages **PACKAGE** and **CFA** (Hunter 1987; Hunter and Hamilton 1992).

Evaluation of the model takes the form of evaluation of content (content validity) and use of statistics to provide empirical evidence of construct validity. These statistics are used to compare the observed correlations between the variables with the correlations predicted by the measurement model (Hunter and Gerbing 1982). One set of statistical tests examines the internal consistency of the model – how the items composing a unidimensional cluster within the model should correlate with one another. Another set of tests for external consistency or parallelism specifies how items should correlate with variables (or factors) outside the cluster (Hunter and Gerbing 1982). These statistics make use of the chi-square distribution for testing hypotheses about the fit of the model to the data. Finally, coefficient alpha is calculated as an index of measurement error within a cluster score.

CFA does require certain assumptions. First, there is the assumption of multivariate normality of observed variables. Secondly, CFA imposes restrictions in the measurement model such that there exists a unique set of parameters that will reproduce an estimate of the population covariance matrix of the observed variables and allows evaluation of the model; this is called model identification (Fink and Monge 1985). More specifically, the model must be overidentified (degrees of freedom greater than zero) – the number of parameters to be estimated must be equal to or less than the number of elements in the model.

CFA is a preferred method for evaluating measurement models for several reasons. The most commonly used alternative method, exploratory factor analysis (EFA) has several drawbacks. First, EFA is an indeterminate technique. No unique solution exists for EFA analyses, since there is an infinite number of factor structures, each with a different set of factor loadings, which may represent the data. Second, because of this lack of unique solution, the researcher is unable to test hypotheses about the model such as the parsimony of the hypothesized data structure, the optimality of the scale, or the acceptability of the underlying structure of the measurement model (Fink and Monge 1985: 168). Furthermore, EFA is a "blind" set of computational procedures used after data have been collected (instead of researchers specifying meaningful measurement models a priori) (Hunter and Gerbing 1982). EFA typically "underfactors", produces fewer factors than there are underlying factors in the data, and it has no "residual" cluster for bad items, thus leading the researcher to include items which perform poorly in clusters (Hunter and Gerbing 1982). On the other hand, CFA 1) provides unique estimates of factors and loadings; 2) permits statistical tests of the adequacy of obtained results; and 3) provides a standard basis for drawing inferences about a population based on sample results (Fink and Monge 1985: 168).

Specific Items and Scales in This Study

Fishing Constraints Items

Two sets of constraints items were developed using the general categories of constraints as described in the model of hierarchical constraints developed by Crawford et al. (1991) (Figure 2-6). In one set, the question posed to respondents interested in going fishing more often was "How important are each of the following conditions in preventing you from going fishing more often?" This question is most similar to the operationalization of constraints used by Ritter et al. (1992). Items in this set included 23 conditions primarily classified as interpersonal and structural constraints, or "intervening constraints," which act primarily to limit participation of interested anglers. In the second set, respondents not

interested in fishing more often were asked to rate the importance of each of a list of reasons why they were uninterested (primarily intrapersonal constraints directly affecting preference for or interest in fishing) (Figure 2-6). The lists of conditions/reasons/constraints were developed primarily from the constraints observed by Ritter et al. (1992), and were supplemented with items from Witt and Goodale 1981, Siemer et al. 1989b, Applegate 1989, and Wright and Goodale 1991. For all items, anglers were asked to respond on a 5 point scale in which 1=not at all important or not a reason, 3=important, and 5=extremely important. This was most similar to the Likert-type response categories used by Crompton and Lamb (1986) and Applegate (1989).

A shorter set of constraints items was developed for assessing potential barriers to angling participation during the teen years. This set parallels the larger "current" constraints sets, but includes items of possible influence for teens (such as access to transportation and gaining freedom). Other teen fishing constraints included interpersonal constraints (changes in fishing activity level of other family members and of friends), intrapersonal constraints (changes in personal interests/preferences), and structural constraints (access - changes in amount of fishing opportunities nearby; time-changes in time due to school, work, family, or other social/recreational obligations). A 5 point scale was used with the following anchor points: very important in decreasing fishing activity in teens, somewhat important in decreasing activity, not a factor, somewhat important in increasing activity, and very important in increasing activity.

Fishing Commitment Scale

Fishing commitment was operationalized using the conceptual frameworks and selected items presented in Buchanan (1985), McIntyre (1989), Ditton et al. (1992), and other recreation researchers. Attitudinal measures of fishing commitment included two measures of affective attachment to fishing: importance compared with other recreation activities, and interest in fishing more often. In addition, a fishing commitment scale was developed which included the fishing importance item and 13 other items measuring side bets, mediated

interaction, self-expression, and centrality using items based on Buchanan (1985), McIntyre (1989), Katz (1981), and Ditton et al. (1992). Respondents were asked to respond to each item describing their involvement in fishing by using a 5-point Likert-type scale.

Measures of fishing behavior include two measures of behavioral consistency (or "focused behavior" described by Buchanan 1985): frequency of license purchase and of angling participation over the past 5 years. The major behavioral variable consists of total number of days spent fishing from December 1, 1991 to November 30, 1992. Results of the focus groups indicated that respondents think of their fishing participation levels in relation to each season, so total annual fishing frequency was calculated from 4 items asking for frequency in each season of the year. Behavioral intentions for purchasing a license and for going fishing during the next license year were also included.

Respondents were also asked about their fishing involvement (attitudinal commitment and behavior) in fishing during both childhood years (birth to age 10 - prior to middle or junior high school) and teen years (age 11 to age 18 - middle or junior high through high school years). The angling behavioral measure for these developmental stages consisted of an item with 6 response categories ranging from "did not fish at all" to "fished very frequently".

Attitudinal commitment was measured by the same 6 point importance item used for adults and by a shortened fishing commitment scale consisting of 5 Likert-type items including items on mediated interaction (TV viewing, reading) and side bets/centrality items. These items were similar to items presented to assess current, adult involvement in fishing.

Stewardship Actions Scale

Due to the questionable practice of including only attitudinal measures of "environmental concern" for assessing an individual's stewardship (Gigliotti 1992), a direct measure of personal stewardship actions was developed for this study. Five items used in the Roper Organization (1990) study were selected; these items represent mainly consumerism actions (recycling, boycotting certain products, carpooling), political action (writing letters to politicians), and persuasion (through contributing money to environmental

organizations). Additional items developed to represent the following categories of environmental actions (as described in Hungerford and Peyton 1980): ecomanagement activities (participating in "clean-ups" or habitat projects), legal action, persuasion (general membership in environmental organization), and political action (contacting a management agency or legislature). In total, a 10 item scale, using the Roper Organization 3-point response categories, was developed and pre-tested. Responses from Michigan anglers were compared directly to the results obtained in the national study by Roper.

Methods for Pilot Survey

Sudman (1983) recommends that the sample size for a pilot survey should be between 20-50 cases (more if there are subgroups in the sampling frame who may have difficulties with the survey). Sheatsley (1983) indicates that pretests can range from 6-100 cases, but that 12-25 cases are usually enough to reveal major difficulties with the survey. One should, however, not rely solely on "convenience samples", but should attempt to obtain a relatively representative sample of individuals from the study sampling frame in order to thoroughly and appropriately test the pilot survey (Sheatsley 1983).

With these design considerations in mind, the sampling frame for the pilot survey consisted of the individuals drawn for the focus group phase, minus those that had actually participated in the focus groups and those individuals which had agreed to participate but did not attend the focus group sessions. Additional reasons supporting the choice of this sampling frame were that this group represented members of the desired sampling frame for the full survey to follow (i.e. resident fishing license holders in the 1991-92 season) and that this group within 1/2 hour of Lansing could be contacted quickly by mail in order to achieve a minimum number of cases for the pretest analysis. A total of 236 individuals were on the pilot survey mailing list (Table 3-4).

Table 3-4. Response rates for pilot survey.

	Young anglers (age 23 and younger)		Older anglers (over age 23)		Total anglers	
	#	% of sample	#	% of sample	#	% of sample
Sample size	108	100.0	128	100.0	236	100.0
Surveys received by Oct. 13	14	13.0	32	25.0	46	19.5
Surveys received after Oct. 13	6	5.6	5	3.9	11	4.7
Undeliverables	31	28.7	30	23.4	61	25.8
Total surveys received and Adjusted response rate	20	26.0	37	37.8	57	32.6

The pilot survey, a cover letter explaining the purpose of the study, and a flyer announcing incentive prizes (charter fishing trips and a cash prize) were included in the pilot survey mailing (see Appendices III and VII). Also included was a stamped, return envelope addressed to the researchers. The sole mailing in this pilot study was made on Friday, September 25, 1993, using bulk rate mail stamped "Address Correction Requested - Return Postage Guaranteed." Response rates for this mailing, by sample age group are shown in Table 3-4. Figure 3-1 shows the response rate over time; the flattening of the curve, beginning on October 7, indicates that the majority of responses for this one mailing had been obtained by this date. The unadjusted response rates for young anglers (13% by October 13) was approximately one-half of the response rate at the same time for older anglers (25%) (Table 3-4). Likewise, the final response rate (adjusted for undeliverables) was also substantially lower for young anglers. The rate of undeliverable mail for young anglers (28.7%) was higher than that for older anglers (23.4%). These pilot results indicate that younger anglers are more mobile, harder to contact, and less likely to respond to this mail survey.

Data were entered using SPSS Data Entry II, and data were analyzed using SPSS/PC+ 4.0 (SPSS, Inc. 1990) to assess the quality and clarity of measurement items and to obtain correlation matrices for use in confirmatory factor analysis to assess the measurement models. CFA was conducted using the PC programs PACKAGE (Hunter 1987) and CFA (Hunter and Hamilton 1992a).

Results of Pilot Survey

General results for the pilot survey are shown in Appendix III. In general, some of the survey instructions for skipping or completing certain sections of the survey were not followed by some of the respondents. These instructions were clarified and the layout of survey items adjusted in the revision process. Other items were modified not only for clarity but for content validity. For example, the questions asking individuals about fishing behavior

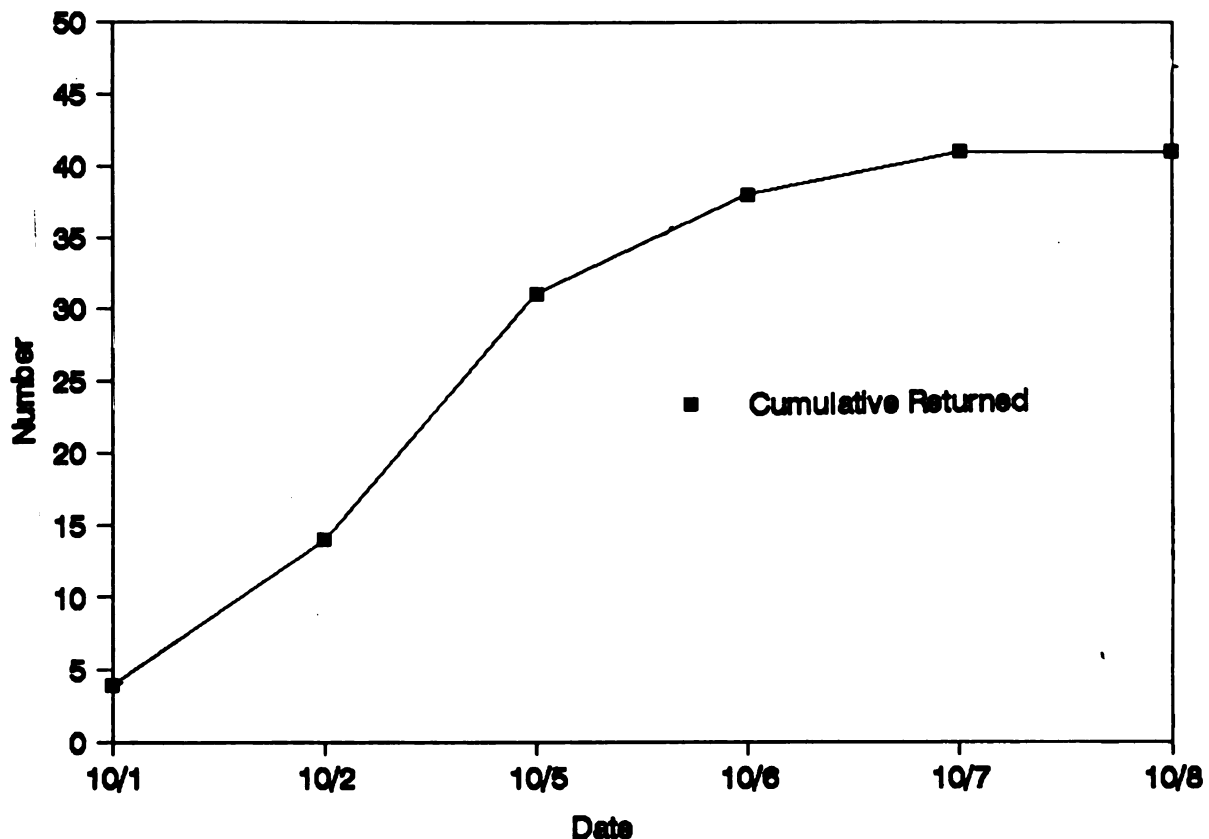


Figure 3-1. Responses to pilot survey.

and commitment during childhood and teen years were improved by providing a reference in the stems of questions to transitional periods (i.e. relating childhood from birth to age 10 or up to the period a person enters middle or junior high school). Another example of such an improvement was increasing the number of response categories for residence area (both during youth and current residence) to four and developing these response categories to be parallel to U.S. Census response categories (see final mail survey in Appendix IV).

In evaluating multi-item scales, the variation among respondents for most scales seemed quite good. For example, for the fishing commitment scale (question number 10), 9% of respondents reported that they are members of a fisheries related organization, whereas 68% reported that they usually watch fishing shows on television (Appendix III). Two items were deleted, however, from the commitment scale due to their redundancy with other items and to their poor performance in reliability estimates for the scale. Items deleted were: "Most of my friends are in some way connected with fishing" and "I usually subscribe to magazines related to fishing." These two items had relatively low corrected item-total correlations (correlation between item and sum of other items on scale); the corrected item-total correlation for "Most of my friends..." was .62 and for "...magazines" was .66. Other items which had low item-total correlations were: "My enjoyment of fishing has influenced my selection of where I live" (.39) and items related to choice of vacation destination (.54) and ownership of recreational property (.48). These items were retained, however, on the scale due to their uniqueness, and were assessed again in the full survey. The coefficient alpha reliability of the scale (prior to removal of the two items) was .92, and after removal of these two items it was .91.

Since the "Most of my friends..." item was removed from the current fishing commitment scale, its performances on the child commitment scale and the teen commitment scale were scrutinized carefully. In both scales, this item had the lowest corrected item-total correlations (.43 on the child involvement scale and .49 on the teen involvement scale), as

well as the lowest correlations with all other individual items on the scale. Coefficient alpha reliabilities for the final scales ranged between .81 and .91 (Table 3-5).

On the stewardship scale, items with the lowest corrected item-total correlations (ranging from .12 to .51) were those five items selected from the national study (contacting agencies, sorting trash, decreasing use of car, and contributing money). In addition, the item concerning membership in environmental organizations had a low item-total correlation of .49. As the case with other scales, there was no difference between the coefficient alpha and the standardized item alpha, indicating that item variances did not differ widely for items within scales. Although these stewardship items performed poorly, they were retained on the survey for their use in comparing anglers with a national sample of the "general public" and for their use as single items in later analysis. Their performance in the full study was scrutinized again; in addition, the CFA results from all scales were examined for the full study.

Phase III - Full Survey

Sample Selection for Full Mail Survey of Anglers

Due to the difference in response rates for the younger vs. older anglers in the pilot study, for the full survey, a stratified random sampling procedure was designed to over-sample for younger anglers in order to have enough young adult respondents (with a better

Table 3-5. Reliability coefficients (alpha) for unidimensional scales.

Scale	Reliability coefficient (alpha)
Current fishing commitment	.91
Childhood fishing commitment	.88
Teen fishing commitment	.88
Stewardship	.81

likelihood of accurate recall of early fishing experiences) for data analysis. Annual resident fishing license holders ages 17 to 24 in 1991-92 (with birthdates in 1968 or later) constituted the "Young anglers" stratum, while licensees ages 25 and older (birthdates before 1968) constituted the "Midage anglers" stratum; these strata correspond with age cohorts used in U.S. Census data analysis. Also, due to the licensing structure in Michigan, the study design called for sampling Senior fishing license holders, Sportsman's license holders (likely to be more active, committed anglers), and Daily license holders residing in Michigan (likely to be less active, committed anglers). Small numbers of anglers were selected from these strata (Table 3-6).

All licensees except Daily fishing license holders were selected by the Michigan Department of Natural Resources from its 1-in-30 computerized sample of 1991-92 license passbook holders. Prior to selection of an angler from this database, records were checked for errors in birthdates or in the match of city to zipcode in the mailing address. Daily license holders were randomly selected by hand from boxes of license records. Resulting sample sizes are shown in Table 3-6.

Implementation of Mail Survey

The questionnaire layout and the mailing procedures used in this full survey generally followed recommendations of Dillman (1978) in his Total Design Method for implementation of surveys. The mailing schedule and enclosures are shown in Table 3-7; the mailing contents (the survey, cover letters and the prize incentive flyer) are included in Appendix IV. Incentive prizes were obtained from donors as a means of increasing overall response rate and response rate from "less committed" anglers. These incentive prizes consisted of \$200 cash, a perch charter fishing trip for two persons, and a salmon charter fishing trip for up to 6 persons.

Table 3-6. Sample size by strata for full mail survey.

Strata	Starting N	Number of unusable addresses and reason	Final N for strata
Sportsman's License holders	200	0	200
Senior fishing license holders	200	0	200
Young anglers (resident annual license holders ages 17 to 24)	550	18 in pilot study sample 6 in focus group study (3 "no-shows")	526
"Midage" anglers (resident annual license holders ages 25+)	1750	10 in pilot study 2 in focus group study (1 "no-show") 1 with no name	1737
Daily fishing license holders	305	2 with unusable addresses	303
TOTALS	3005		2966

Table 3-7. Survey mailing schedule and procedures.

MAILING NUMBER	DATE (in 1992)	CONTENTS OF MAILING AND MAIL TYPE
1	Tues., Nov. 3 Wed., Nov. 4 - Daily license surveys mailed	Cover letter Survey Prize flyer Stamped return envelope Bulk mail rate
2	Tues., Nov. 17 Thurs., Nov. 19 - to daily license holders	Reminder postcard First class
3	Tues., Dec. 1	Cover letter Survey Prize flyer Stamped return envelope Bulk mail rate
4	Tues., Dec. 22	Letter Pre-sorted first class mail

The first survey returns were received on Monday, November 9. Figures 3-2 and 3-3 show the progress of receipt of survey returns. During the course of this study, several holidays occurred, possibly impacting not only the flow of survey returns, but perhaps reducing the overall response rate as well. These holidays included: Tues. Nov. 3 - Election day, Wed. Nov. 11 - Veterans Day, Thurs. Nov. 26 - Thanksgiving, University closed - Friday Nov. 27, Thurs. Dec. 24, Fri. Dec. 25, Thurs. Dec. 31, Fri. Jan. 1. In addition, the Michigan Firearms Deer Hunting Season occurred from November 15 through the rest of the month; this, too, may have affected response rates obtained. Due to the level of response at the end of 1992, in the final mailing, a deadline date for return of surveys to be entered in the prize drawing (and to be analyzed in this study) was highlighted. Returned surveys had to be postmarked by January 8, 1993. Only those surveys postmarked by this date were entered into the prize drawing, but surveys returned until January 28 were still used in the study.

An overall adjusted response rate of 58.8% was achieved. Table 3-8 summarizes the survey response rate by strata.

Table 3-8. Survey response rates. Information later used to establish plan for non-respondent follow-up survey.

Strata	Usable # of cases (respondents)	Adjusted response rate	Undeliverable rate	N remaining on mailing list
Sportsman's	124	72.9%	15.0%	46
Seniors	95	61.7%	23.0%	59
Young (ages 17-24)	187	46.2%	23.0%	218
Midage (age 25+)	878	62.6%	19.3%	524
Daily	107	46.1%	23.4%	125
TOTAL	1391	58.8%	20.2%	975

Data entry was accomplished by three coders/data entry student employees using SPSS Data Entry II (SPSS, Inc. 1990). An independent verification technique was used, as recommended by Karweit and Meyers (1983) by having a fourth individual code and enter a 1 in 3 sample of approximately the first 100 surveys coded by each data entry student. After error rates for this sample were checked (Table 3-9), a 1 in 10 sample of the remaining surveys was verified (see Table 3-10). All error rates were well below the usual, expected error rate of 2-4% in transcription of data from an original document to machine readable form (Karweit and Meyers 1983). While there were slight differences among coders/data entry students in their error rates, all experienced a substantial decline in error rate as coding and data entry proceeded. Data cleaning was accomplished by examining variable response frequencies for entries out of the acceptable range of values for any given variable. To resolve any errors, the original survey was checked and the correct value entered, as recommended by Karweit and Meyers (1983).

Data were analyzed using SPSS/PC+ 4.0 (SPSS, Inc. 1990), PACKAGE (Hunter 1987), and CFA (Hunter and Hamilton 1992a). In addition, path models were tested using PATH (Hunter and Hamilton 1992b). The chi-squared statistic was used to compare results for nominal or ordinal level variables; SPSS procedures "oneway" and "anova" (and the F statistic) were used for analysis of variance problems comparing means of interval level dependent variables. To test the assumption of homogeneity of variances necessary for analysis of variance, Cochran's C and its associated probability were computed. In instances where this assumption of homogeneity of variance was violated (most instances were probably due to small sample size of one or more of the groups under comparison), nonparametric tests were used to detect significant differences between groups. These nonparametric tests included the Mann-Whitney U test (using the z-statistic for medium-sized samples) and the Kruskal-Wallis test.

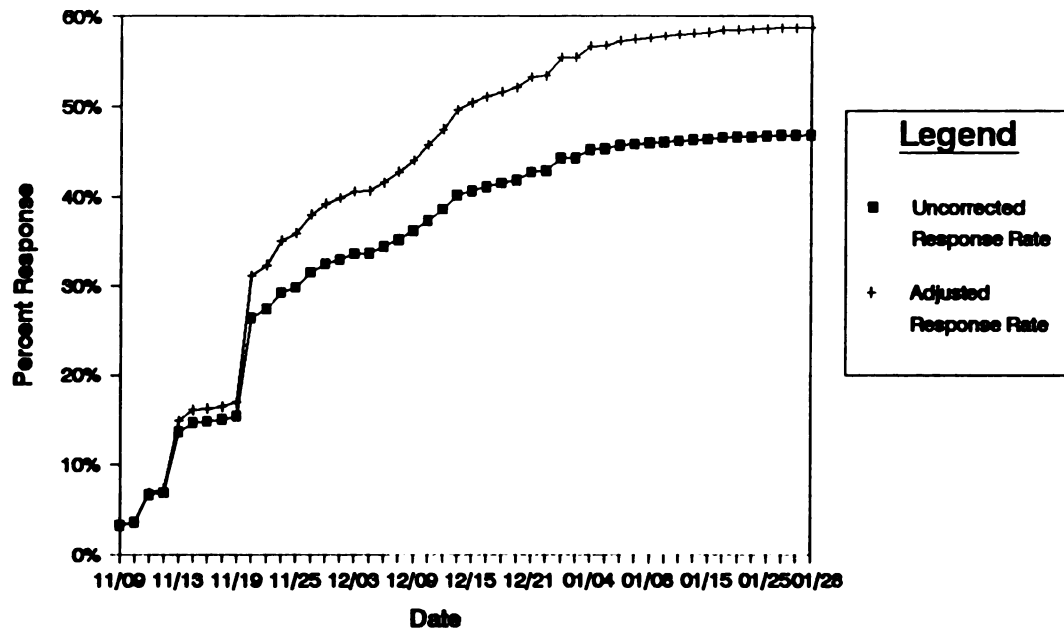


Figure 3-2. Uncorrected and adjusted (for undeliverables) response rate over time.

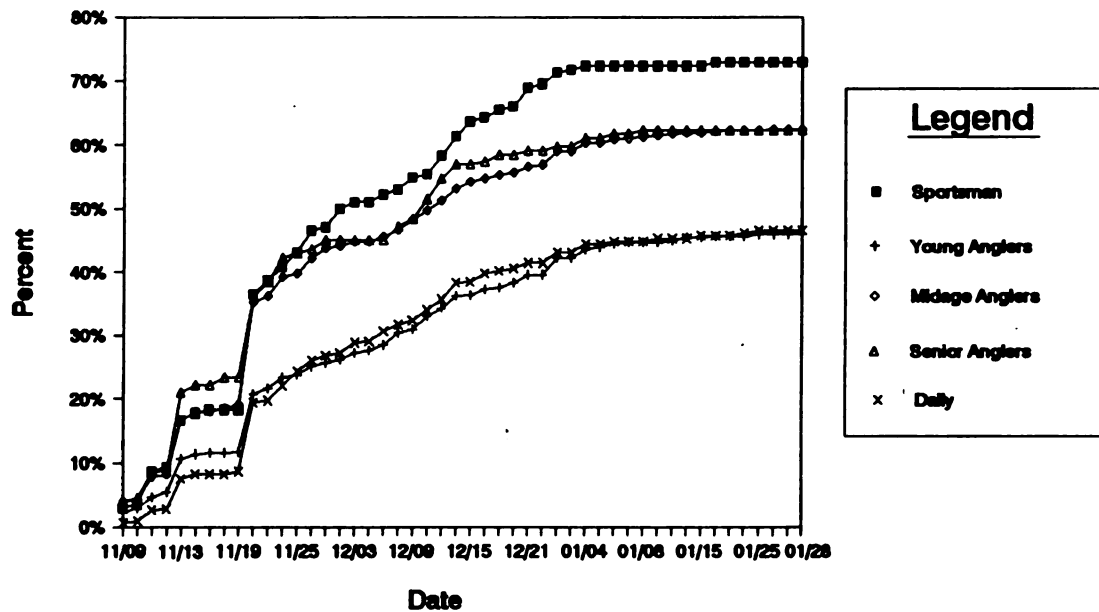


Figure 3-3. Adjusted response rate for full mail survey by sample strata.

Table 3-9. Error rates in preliminary verification of 1 in 3 surveys of first approx. 100 surveys coded and entered.

Coder	# errors	# surveys verified	# keystrokes (# surveys x 250 keystrokes per survey)	Error rate per keystroke (# errors div. by # of keystrokes)*	1 / error rate
Coder 1	28	36	9000	.0031	1 error in every 323 keystrokes
Coder 2	13	40	10,000	.0013	1 error in every 769 keystrokes
Coder 3	16	35	8,750	.0018	1 error in every 556 keystrokes

* about 1/3 were interpretive errors (vs. keystroke errors)

Table 3-10. Error rates in continuing verification of 1 in 10 surveys coded and entered.

Coder	# errors	# surveys verified	# keystrokes (# surveys x 250 keystrokes per survey)	Error rate per keystroke (# errors div. by # of keystrokes)*	1 / error rate
Coder 1	14	37	9,250	.0015	1 error in 667 keystrokes
Coder 2	18	52	13,000	.0014	1 error in 714 keystrokes
Coder 3	2	9	2,250	.0009	1 error in 1,111 keystrokes

* nearly all were keystroke errors (vs. interpretive errors)

A Review of the Use of Path Analysis in Causal Modelling

Although causal modelling and the particular technique of "path analysis" have been popular heuristic and analytical tools in the social sciences since the 1970s (Hunter and Gerbing 1982, Asher 1990), the use of this approach in recreational research has been limited to a few efforts such as those of Christensen (1980), who used path analysis to show that the social action system (social group) as well as the social aggregate system (operationalized as age of individual) are related to fishing participation.

The strength of causal modelling lies in moving beyond simple correlation of independent and dependent variables in a "relatively unthinking fashion" to thinking causally about a problem, showing that problem with an arrow diagram that represents hypothesized causal processes (Asher 1990: 8,9). The heuristic value of this approach is that it facilitates clearer statements of hypotheses and of causal relationships among processes and events (Hunter and Gerbing 1982, Asher 1990).

Path analysis, a specific technique employed in causal modelling, is "basically concerned with estimating the magnitude of the linkages between variables and using these estimates to provide information about the underlying causal processes" (Asher 1990:30). Path analysis begins with a theoretically based list of important causal processes from the setting under consideration (Hunter and Gerbing 1982). The choice of the variables to be included in the analysis is based on theoretical and substantive insights into the problem under consideration (Asher 1990). This integrated theory of relations among the variables is called a "path diagram." If the relationships among the variables are all linear, then that path diagram can be interpreted in a series of equations called a "structural equation model" or a "path model" (Hunter and Gerbing 1982: 282). In conclusion, then, a path model represents a set of predicted relationships within the data which is derived from theory. Path analysis is a data summary technique (Hunter and Gerbing 1982: 284).

Path models consist of exogenous and endogenous variables, and they may be either recursive models or nonrecursive models. Exogenous variables are those not influenced by

any other variables within the specified model (Asher 1990), whereas endogenous variables are explained inside the model (Hunter and Gerbing 1982). In recursive models, there are no feedback loops or reciprocal linkages between variables (Asher 1990). In nonrecursive models, however, there are such bidirectional relationships, and a different method of path analysis is required than that which is outlined below and demonstrated throughout this paper.

Once a path model is specified, the remaining steps of path analysis are as follows. First, the researcher calculates the size of model parameters called "path coefficients". In a recursive model, a path coefficient is estimated to be the correlation between two variables. In the case of multiple causation, the path coefficient between two variables is a beta weight obtained by regression analysis. Next, the researcher tests the fit of the path model. The steps in this process are to:

- 1) generate a set of predicted parameters/correlations using the "product rule" (that the correlation of two variables separated by one mediating variable is the product of the two correlations between the variables);
- 2) calculate the deviations between observed parameters and predicted parameters for "unconstrained parameters" or "missing links" (the parameter between two variables where a causal linkage has been omitted), and analyze these deviations to determine whether they could have occurred by chance; and
- 3) accept or reject the H_0 : that the data are consistent with the model (may use chi-square statistic for this step).

Certain assumptions and limitations are inherent in the use of path analysis. Causal relationships among variables must be inferred based on observations from the data and from assumptions. Three conditions must be met in order to infer causality: a) there must be concomitant variation between the two variables; b) there must be a time ordering between the first and second variable; and c) there should be no third variable (confounding variable) responsible for the observed relationship between the two variables (Asher 1990: 12).

Therefore, we must assume, at some point, that the effects of confounding variables are negligible (Blalock 1964: 26, as cited in Asher 1990:13), and we should make every effort to avoid specification error – the leaving out of potentially confounding variables, or the improper delineation of the causal structure (Asher 1990: 29). In fact, the identification of all possible causal antecedents can "greatly increase the quality of estimation within the path model" (Hunter and Gerbing 1982: 285).

Other assumptions important in path analysis are that: 1) relationships between variables are linear; 2) the mean of any error term for a variable is 0; 3) the error term has a constant variance for different values of an X; 4) pairs of error terms are uncorrelated, and 5) the independent variables and error term in the same structural equation are uncorrelated (Asher`1990: 26). These last assumptions are necessary in order to employ ordinary least squares operations for estimation of parameters in the model. These assumptions, in summary, are similar to those required for any regression analysis techniques for examination of data, and present no further restrictions than such other techniques.

Path analysis, however, has many advantages. Its major contribution is that it provides for the decomposition of the correlation coefficient into numerical components which allows for the examination of the net effect of each type of relationship among variables separately (Hunter and Gerbing 1982: 291). In other words, path analysis allows the measurement of both the direct and indirect effects that one variable has on other variables in the model (Asher 1990: 33).

In summary, then, path modelling consists of the steps of identifying a theory of causal processes among a set of variables, predicting the relationships among these variables, and then testing the causal model with a path analysis (Hunter and Gerbing 1982). Path analysis is superior to ordinary regression analysis because it allows the researcher to move beyond merely the estimation of direct effects to the examination of "causal processes underlying the observed relationships and to estimation of the relative importance of alternative paths of influence. The model testing permitted by path analysis further

encourages a more explicitly causal approach in the search for explanations of the phenomena under investigation" (Asher 1990: 36-37). In the absence of opportunity to carry out an experimental design, this approach, then, seems ideally suited to examining the phenomena of fishing socialization.

Phase IV - Non-respondent Follow-up Phone Survey

Since the overall response rate was moderate (adjusted response rate of 58.8%), and since response rates within the Young Angler and Daily license holder strata were low (Table 3-8), a non-respondent telephone follow-up survey was necessary. The purpose of this survey was to assess the degree of representativeness within strata of respondents' responses, particularly with regards to current fishing involvement and early fishing background. The phone survey used is included in Appendix V.

Non-respondents from the Young, Midage, and Daily license strata were selected randomly. At first, 75 individuals were selected from each strata; after calls to these individuals were completed, there were not enough non-respondents contacted to conduct an adequate comparison of respondents with non-respondents. Additional individuals were randomly selected from each strata. Sample sizes and phone survey contact results are summarized in Table 3-11. Calls were made to non-respondents from February 14 through March 17, 1993.

Data for non-respondents were entered using SPSS-PC Data Entry II and were compared with respondent data by using SPSS/PC+ 4.0.1 (SPSS, Inc. 1990). Pooled data for non-respondents were compared with data for all respondents using the chi-square statistic for most variables. The variables of age (current) and age of first fishing experience were analyzed using one-way analysis of variance. Since distributions of these variables differed for non-respondents vs. respondents, the Mann-Whitney U nonparametric statistic was used to compare these two groups. Likewise, the Mann-Whitney U statistic was used

for all variables for within strata (i.e. within "Young anglers", within "Midage anglers", and within "Daily license holders") comparisons of non-respondents with respondents.

Table 3-11. Contact results for telephone non-respondent follow-up survey.

	Young anglers (age 23 and younger)		Midage anglers (over age 23)		Daily license holders	
	#	% of sample	#	% of sample	#	% of sample
Number drawn	150	100.0	140	100.0	120	100.0
# of completed phone surveys	29	19.3	39	27.9	29	24.2
# not listed in directories	83	55.3	60	42.9	50	41.7
# "Not at this #", moved, wrong #, died	14	9.3	14	10.0	14	11.7
Called 4 times, no contact	7	4.7	9	6.4	15	12.5
Refusals	17*	11.3	17	12.1	11	9.2
Survey received during follow-up period	0	0	1	0.7	1	0.8

*Some of Young non-respondents' refusals were made by other adults at that phone number on their behalf.

CHAPTER 4

RESULTS

Results From Non-respondent Telephone Survey

The most frequently reported reason for not responding to the mail survey was "not enough time", or "too busy" (51.5% of non-respondents). Many young and mid-age non-respondents reported that they were too busy. Some non-respondents (13.4%) stated that they did not remember receiving the survey. Of all non-respondents, 11.3% reported "they don't fish" as a reason for not completing the survey; 27.6% of Daily license non-respondents reported not fishing as a reason. About 10% of non-respondents indicated that they had wanted to respond, but had lost the survey.

Comparisons of respondents vs. non-respondents are summarized in Table 4-1 and in Appendix VI. In general, non-respondents differed from respondents in level of fishing involvement, with respondents being more active and involved anglers. There were few differences between the two groups, however, in fishing antecedent or socialization variables. Non-respondents were older than respondents at the time of their first fishing experiences; median age at first fishing experience was 7 years for non-respondents and 6 years for respondents. Slightly more non-respondents (75%) than respondents (73%) reported that their fathers fished. Respondents had a higher level of childhood fishing activity, more frequently reported that early fishing experiences influenced later fishing activity, and reported more satisfaction with early fishing experiences. Finally, the two groups did not differ significantly in current sociodemographic background. One exception to this was that non-respondents were younger (median age of 35) than respondents (median age 41); this finding, however, is an artifact of the sampling done for non-respondents which excluded Senior Fishing license holders from this non-respondent follow-up survey.

Table 4-1. Summary of comparisons of respondents vs. non-respondents. *** signifies differences with $p < .001$; ** signifies $.001 < p < .01$; * signifies $.01 < p < .05$. n.s. signifies $p > .05$. Exact probabilities are shown in tables in Appendix VI.

Variable	All respondents vs. non- respondents	Young angler respondents vs. non- respondents	Midage angler respondents vs. non- respondents	Daily license respondents vs. non- respondents
FISHING INVOLVEMENT				
Consistency of fishing over past 5 years	***	***	n.s.	*
Annual total days fishing	***	*	***	***
Fishing intentions next year	***	n.s.	**	***
Fishing importance	***	n.s.	n.s.	***
Fishing interest	***	*	n.s.	***
ANTECEDENT VARIABLES				
Sex	n.s.	n.s.	n.s.	n.s.
Residence as youth	n.s.	n.s.	***	n.s.
Family type	n.s.	n.s.	n.s.	n.s.
Age of first fishing experience	**	*	n.s.	**
SOCIALIZATION VARIABLES				
Immediate family fishing participation	n.s.	n.s.	n.s.	n.s.
Mother's fishing behavior	n.s.	n.s.	n.s.	n.s.
Father's fishing behavior	**	n.s.	n.s.	n.s.
Childhood fishing activity	*	n.s.	n.s.	*
Change in teen fishing	n.s.	n.s.	n.s.	n.s.
Influence of early fishing experiences on later fishing	*	n.s.	n.s.	n.s.
Early fishing satisfaction	***	n.s.	n.s.	n.s.
CURRENT SOCIODEMOGRAPHIC VARIABLES				
Age	***	n.s.	n.s.	n.s.
Residence area	n.s.	n.s.	n.s.	n.s.
Education level	n.s.	n.s.	n.s.	*

When non-respondents were compared with respondents within each sample strata, similar results were observed with only a few exceptions. As would be expected, Daily license non-respondents had significantly lower fishing participation levels (as measured by all fishing involvement variables) compared with Daily license respondents. Midage angler respondents differed from non-respondents only in annual total days fishing and fishing intentions in the next license year. Young angler respondents reported higher annual total days fishing and greater fishing interest than young angler non-respondents. Interestingly, however, a significantly greater proportion of young angler non-respondents than respondents reported that they had gone fishing every year during the past five years.

In examining fishing antecedent variables, few within-stratum differences between non-respondents and respondents existed. A significantly higher proportion of midage angler non-respondents grew up in an urban area. In both the young angler stratum and the daily license stratum, non-respondents had a significantly later introduction to fishing. The median age of first fishing experience for young angler non-respondents was 6 years and for respondents was 5 years; the median age of first fishing for daily license holder non-respondents was 10 years, whereas the age of introduction for respondents was 6 years.

In fishing socialization variables, there was only one within-stratum difference observed between non-respondents and respondents. Childhood fishing activity of daily license non-respondents was lower than that of daily respondents. The only within-stratum difference in current sociodemographic variables was that a somewhat higher proportion of daily license non-respondents than respondents had a college-level education than daily license respondents.

In summary, differences between non-respondents and respondents were limited to general fishing participation levels and to only a few fishing antecedent and fishing socialization variables. There were no notable differences between non-respondents and respondents in current sociodemographic variables, thus indicating no response bias on the basis of current residence area, age or education level. While it appears that many of the

non-respondents were lower-level fishing participants, since a 59% response rate to the survey was achieved, and since there is adequate variance in fishing participation levels among the respondents, the quality of the respondent data was judged to be adequate for further unweighted analysis to address the major study research questions.

Description of Respondents to Full Survey

Respondents were predominantly male (83.1%); 20% had grown up in single-parent homes, and over 34% grew up in urban areas (Table 4-2). Males did not differ from females in residence during youth ($\chi^2=2.03$, 3 d.f., $p=.566$) or in whether they came from single parent families ($\chi^2=0.28$, 1 d.f., $p=.596$). Males and females did differ significantly in mean current age, with female respondents younger than males (Table 4-3). Respondents who had grown up in rural-farm areas were significantly older than respondents from other areas as youth (Table 4-3).

Disproportionately more anglers than the general population had grown up in small town areas with populations of 2500 to 50,000 residents (Table 4-4). Persons from urban areas constituted only 38% and 30% of young anglers in 1970 and 1980 (respectively), whereas over 60% of young persons (under age 18) lived in urban areas in those years. Clearly, most angling recruitment is occurring in small town and rural areas.

The proportion of anglers who spent some time before age 18 in single-parent families (25%) appears to be similar to the proportion of youth under age 18 who were in single-parent homes in 1980 (Table 4-5). Although the questionnaire item assessing family type while growing up was somewhat different than the item used on U.S. Census surveys, it appears as though the proportion of anglers from single-parent homes is keeping pace with the increase in single-parent homes in Michigan.

Table 4-2. Characteristics of repondents.

Characteristic	Number of respondents	% of respondents
Sex		
Male	1147	83.1
Female	233	16.9
Family type		
Single parent - male-headed household	63	4.6
Single parent - female-headed household	211	15.4
"Traditional" - two parent	1093	80.0
Residence during youth		
Rural - farm	313	23.3
Rural - nonfarm (area of <2500 people)	178	13.2
Small town (2500-50,000 people)	394	29.3
Urbanized area (city or suburban area > 50,000)	459	34.2
Current residence		
Rural - farm	255	18.6
Rural - nonfarm (area of <2500 people)	203	14.8
Small town (2500-50,000 people)	442	32.2
Urbanized area (city or suburban area > 50,000)	471	34.4

Table 4-3. Mean current age of angler respondents by sex, residence during youth, and family status/type during youth.

Antecedent variables	N	Mean current age (years)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)
Sex							
Male	1145	42.49	.43	41.66 - 43.33			
Female	231	39.98	.89	38.22 - 41.74	5.95	** .015	.101
Residence Area as Youth							
Rural - farm	307	44.47	.86	42.78 - 46.15			
Rural - nonfarm	178	40.92	1.02	38.90 - 42.94			
Small town/suburban	392	40.44	.74	38.98 - 41.90			
Urban	454	41.56	.61	40.36 - 42.76	5.16	** .002	.128
Family Status/Type							
"Traditional" two-parent	1090	42.26	.42	41.43 - 43.09			
Single parent - male headed	63	40.70	1.90	36.90 - 44.50			
Single parent - female headed	211	41.17	1.06	39.07 - 43.26	.80	.448	.236

Table 4-4. Residence during youth of Michigan youth and angler respondents, 1970 and 1980. (Sources for Michigan data in column (a): Bureau of Census, U.S. Dept. of Commerce 1973 and 1982.)

Residence area during youth	% of Michigan population under age 18 in... (a)		% of current anglers under age 18 in...	
	1970	1980	1970	1980
Urban (50,000+)	62.5	60.3	38.1	29.5
Small town (2500-50,000)	9.6	7.7	32.7	35.8
Rural (<2500)	27.9	31.9	29.2	34.7

Table 4-5. Family type ("traditional" vs. single-parent) for Michigan youth and angler respondents.

	Michigan data			Angler respondent data		
	% of Michigan Youth			% of anglers who were under age 18 in...		
	1980	1990		1970	1980	1990
% of households with children with married adults present	79.8	71.8	% who ever lived with "traditional" two-parent family	78.8	75.1	na
% of households with children with single parents	20.2	28.2	% who ever lived with single-parent family	21.2	24.9	na
% of Michigan children living with one parent	16.5	22.5	% who ever lived with single mother	16.3	19.7	na

Michigan data: calculated from data presented in Michigan League for Human Services, 1992.

Finalization of Measurement Scales and Fishing Involvement Typology

Fishing Commitment Scales

Three fishing commitment measurement models (childhood fishing commitment, teen fishing commitment, and current fishing commitment) were tested using Confirmatory Factor Analysis (CFA). CFA output was examined to identify the factor loading for each item on its hypothesized factor. Items which did not clearly load on one factor and which had low ($<.40$) factor loadings were deleted from analysis. Finally, if an item was not internally consistent with other items in a hypothesized factor (i.e. if the difference between the observed and predicted correlations was outside the 95% confidence interval around the observed correlation), that item was deleted.

Neither the childhood fishing commitment scale nor the teen fishing commitment scale proved to be unidimensional; although factor loadings were high, errors were outside 95% confidence intervals for observed correlations (i.e. items were not internally consistent). No set of four or more items clustered together in one factor for either the childhood or the teen commitment scales. The items probably constitute measurement items for more than one factor, but not enough items were included to test a multi-dimensional model.

For the current fishing commitment scale, items with poor (low) factor loadings and internal consistency were deleted; the following items remained: current importance of fishing, fishing says a lot about who I am, I often visit stores, I often talk with friends, and I spend money on fishing (Table 4-6). This final scale has a standard coefficient alpha reliability of .87. The range of factor loadings was .67- .82, and the average correlation within factor was .57. It appeared that other items in the original scale tap into other constructs; for example, the items related to geographic relationship to fishing (vacation destinations, home ownership, and ownership of recreational property) may measure a different factor than overall fishing commitment. Likewise, the items related to mediated interaction with fishing (for example, reading about fishing, maintaining membership in a fishing organization, and watching outdoor or fishing television shows) may form their own factor. Without more items

to construct an over-identified measurement model, these items cannot be assumed to be unidimensional, and therefore cannot be summed.

Stewardship Activities Scale

Items in the hypothesized unidimensional stewardship activities scale were tested in a similar manner. No set of four or more items was internally consistent, therefore, no single scale could be constructed. Further refinement of these items, and addition of other stewardship items may allow the development of a multi-dimensional stewardship behavior scale.

Table 4-6. Frequency of respondents agreeing with fishing commitment statements and factor loadings for each statement.

Fishing Commitment Statement	% of respondents agreeing
I frequently watch fishing or outdoor shows on television.	57.9
I frequently visit stores to view new equipment related to my interest in fishing.	51.9
I frequently read about fishing.	45.3
Fishing says a lot about who I am.	31.1
I often talk to my friends about fishing.	61.1
I spend a great deal of money on fishing.	27.5
I find that a lot of my life is organized around fishing.	17.6
My enjoyment of fishing has influenced my selection of where I live.	24.4
I maintain a membership in an organization which is directly related to fisheries or fishery management (e.g., MUCC, TU, B.A.S.S.)	15.6
My enjoyment of fishing has influenced my choice of vacation destinations.	50.8
I own a recreational property primarily so that I can be close to fishing.	19.2

Current Fishing Involvement Typology

Using the fishing commitment scale (sum of the items current importance of fishing, fishing says a lot about who I am, I often visit stores, I often talk with friends, and I spend money on fishing), and fishing behavior level (annual total days fishing) a fishing involvement typology was constructed (Table 4-7). Respondents were classified into high and low fishing commitment (above and below the median total fishing commitment score of 17) and into high and low fishing behavior categories (above and below the median total days fishing of 24). Latent anglers were those anglers who had high fishing commitment, but low fishing behavior; spurious (or "false" or superficially like anglers) anglers had high fishing behavior, but low fishing commitment. The resulting number of respondents in each fishing involvement type is shown in Table 4-7.

A typology weighted for nonresponse bias was also calculated. Nonrespondents had a median fishing participation level of 6 days per year, substantially below that of respondents. Accounting for nonresponse rate, the weighted median fishing participation level of this sampling frame, then, was 17 days per year. Since no fishing commitment questions were asked of nonrespondents, this portion of the typology could not be weighted. Using the weighted median in the typology resulted in different classification of only a few respondents, and the analysis of weighted typology results differed little from the unweighted

Table 4-7. Typology of fishing involvement (unweighted).

Level of Affective Attachment to Fishing (Fishing Commitment Scale)	Fishing Behavior Level (Total Days Fishing per Year)	N	Fishing Involvement Type
High (18-26)	High (≥ 25 days)	481	High Involvement
Low (5-17)	High (≥ 25 days)	148	Spurious (moderate)
High (18-26)	Low (0-24 days)	201	Latent (moderate)
Low (5-17)	Low (0-24 days)	445	Low Involvement

results. Thus, the unweighted typology of fishing involvement was used throughout the remaining analysis.

Findings from Full Survey

I. Relationships of Fishing Antecedent Variables to Socialization Processes and Fishing Involvement

Relationships of Antecedents to Exposure Agents

Sex of youth, residence area during youth and family type while growing up all had some relationship with fishing exposure agents. Significantly more females than males reported that their mothers fished occasionally or regularly; slightly more females than males had fathers who fished (Table 4-8). There were no differences between males and females in the presence of immediate family members who fished and in the proportion of extended family members who fished. Males and females were alike in that over 50% reported that important people had positive influence on their interest in fishing (Table 4-8). The most frequently mentioned person with positive influences was "father."

Residence area during youth was significantly related to fishing exposure agents in several ways. Significantly fewer respondents from rural-farm and urban backgrounds than from rural-nonfarm areas or small towns reported the presence of immediate family members who fished, high proportions of extended family members who fished, or mothers or fathers who fished (Table 4-9). Over 80% of all respondents from rural-nonfarm areas reported that some immediate family members fished, whereas 75% of those from rural-farm settings had family members who fished while they were growing up. Over 58% of anglers from rural-farm and urban areas reported their mothers did not fish; 29% of anglers from rural-farm areas and 24% of those from urban areas reported their fathers did not fish.

Family type while growing up was related only to mother's and father's fishing frequency levels (Table 4-10). Significantly more anglers from "traditional" two-parent families than from single parent families reported that their mothers did not fish. Respondents who

Table 4-8. Exposure agents by gender for angler respondents.

Exposure Agent Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Immediate Family Members Fished	80.5	83.6	1.15	1	.284
Proportion of Extended Family Members Who Fished:					
No one	10.6	9.2			
Fewer than half	28.8	27.5			
At least half	19.5	15.3			
Most	17.6	23.1			
Everyone	12.6	13.5			
Don't know	10.8	11.4	5.61	5	.346
Mother's Fishing Frequency (for those with mother present at least some of time while growing up):					
Did not fish	57.9	39.8			
Occasionally fished	28.5	36.0			
Regularly fished	12.6	23.7			
Don't know	0.9	0.5	28.59	3	***<.001
Father's Fishing Frequency (for those with father present at least some of time while growing up):					
Did not fish	24.7	19.7			
Occasionally fished	27.0	24.4			
Regularly fished	47.4	55.4			
Don't know	1.0	0.5	5.10	3	.165
Did important people have a positive influence on your fishing?					
Don't remember	8.9	8.4			
No	37.1	34.2			
Yes	54.0	57.3	.85	2	.655

Table 4-9. Exposure agents by residence area during youth for angler respondents.

Exposure Agent Variable	Residence Area As Youth					χ^2	d.f.	p
	Rural - farm (%)	Rural - nonfarm (%)	Small town (%)	Urban (%)				
Immediate Family Members Fished	75.8	84.4	83.1	80.9		7.65	3	* .053
Proportion of Extended Family Members Who Fished:								
No one	11.4	9.6	9.0	11.6				
Fewer than half	29.6	22.0	24.4	34.6				
At least half	18.9	22.0	19.5	16.7				
Most	17.6	23.7	22.1	14.0				
Everyone	11.7	9.6	13.8	12.9				
Don't know	10.7	13.0	11.3	10.1		28.28	15	* .020
Mother's Fishing Frequency (for those with mother present at least some of time while growing up):								
Did not fish	58.9	46.5	52.4	58.4				
Occasionally fished	26.6	32.5	34.1	27.2				
Regularly fished	14.4	19.7	11.5	14.2		23.54	9	** .005
Don't know	0.0	1.3	2.1	0.2				
Father's Fishing Frequency (for those with father present at least some of time while growing up):								
Did not fish	29.3	21.1	21.1	24.2				
Occasionally fished	28.6	22.3	26.7	26.3				
Regularly fished	41.7	56.6	50.3	48.8		19.08	9	* .025
Don't know	0.4	0.0	2.0	0.7				
Did important people have a positive influence on your fishing?								
Don't remember	9.8	9.1	8.6	7.6				
No	42.0	39.4	35.1	33.8				
Yes	48.2	51.4	56.4	58.7		9.36	6	.154

Table 4-10. Exposure agents by family status/type during youth for angler respondents.

Exposure Agent Variable	Family status/type				χ^2	d.f.	p
	Single-parent			Female-headed (%)			
	"Traditional" two-parent (%)	Male-headed (%)					
Immediate Family Members Fished	81.5	81.0		78.5	1.01	2	.602
Proportion of Extended Family Members Who Fished:							
No one	10.1	9.8		13.0			
Fewer than half	29.5	21.3		25.1			
At least half	18.9	23.0		16.9			
Most	17.4	23.0		23.2			
Everyone	12.9	13.1		11.1			
Don't know	11.1	9.8		10.6	9.02	10	.530
Mother's Fishing Frequency (for those with mother present at least some of time while growing up):							
Did not fish	55.6	43.5		51.9			
Occasionally fished	29.9	37.0		29.1			
Regularly fished	14.1	17.4		16.4	13.30	6	* .039
Don't know	0.4	2.2		2.6			
Father's Fishing Frequency (for those with father present at least some of time while growing up):							
Did not fish	22.4	23.3		33.3			
Occasionally fished	27.4	26.7		19.8			
Regularly fished	49.7	48.3		43.8	22.20	6	***
Don't know	0.5	1.7		3.1			<.001
Did important people have a positive influence on your fishing?							
Don't remember	8.8	10.2		7.8			
No	36.5	37.3		37.9			
Yes	54.7	52.5		54.4	.51	4	.973

were from female-headed single parent households had the highest proportion of non-fishing fathers. Interestingly, however, there were no significant differences among respondents from different family types in presence of immediate family members who fished or in the proportion of extended family members who fished; about 80% of anglers from all family types reported some immediate family members who fished.

Relationships of Antecedents to Nature (Quality and Type) of Fishing Exposure

Satisfaction levels with earliest fishing experiences were not related to fishing antecedent variables (Appendix VII, Tables A-1 to A-3). The majority of all anglers rated their earliest experiences as enjoyable.

The groups did differ significantly, however, in the types of experiences they had during their earliest fishing outings. Significantly fewer females than males handled fish, cleaned fish, caught lots of fish, and reported problems with fishing equipment during their earliest fishing outings (Table 4-11). More females than males reported being afraid of water or fish, although only about 20% of females were afraid (Table 4-11). Respondents from rural-farm backgrounds more frequently reported they ate fish caught than other residence groups (Table 4-12). More anglers who had grown up in urban areas than in any other areas reported they had to follow rules while on earliest fishing outings. Significantly more respondents from female-headed single-parent households than from male-headed or traditional households helped plan fishing outings (Table 4-13). Fewer anglers from male-headed families than from other families handled fish, but over 75% of all groups did so (Table 4-13). When asked about the influences of such experiences on fishing interest, anglers varied only somewhat in their responses. Significantly more females than males reported that handling fish, handling lures, seeing fish die, cleaning fish, and being bothered by insects or bad weather decreased their fishing interest; but the largest proportions of both males and females reported that these experiences had no effect on fishing interest. Significantly more anglers from urban areas than

other residence groups reported that handling fish, having to follow rules, and catching no fish decreased fishing interest. There were no differences among family type groups in influences of these experiences on fishing interest.

In types of fishing and water-related experiences gained during youth, there were no differences among respondents who had been raised in various family types. There were, however, significant differences in the nature of exposure obtained by females vs. males. Significantly more males than females had attended a fishing event (clinic or derby), fished while on a school-related experience, fished at a summer camp, fished with a local youth club or organization, and fished while camping with family (Table 4-11). Large proportions of both male and female anglers report having gone camping with family as a youth (over 66%) and having done water-related activities such as boating, swimming while growing up (about 88%); few, however, report having gone fishing at a trout farm or other fee fishing facility (less than 20%) (Table 4-11). Significantly more anglers from urban and small town backgrounds than from other areas had attended a fishing event as youth; more respondents from small towns than from any other areas had gone camping with family and fished while camping with family (Table 4-12). Fewer anglers raised in rural-farm settings than in any other areas had done water-related activities such as boating or swimming while in youth.

Anglers from different antecedent backgrounds did not differ in the degree to which early experiences influenced current fishing interest (Table 4-14; Appendix VII Tables A-4, A-5). Most reported that these early experiences either definitely or somewhat influenced current fishing interest. Significantly more females (39.5%) than males (29.9%) reported that a single event during their earliest experiences influenced their current fishing interest or participation (Table 4-14). The most frequently mentioned event influencing current interest was catching fish on early outings.

Table 4-11. Activities done as a youth and events during earliest fishing experiences by gender of angler respondents.

Nature of Exposure Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Activities Done as a Youth					
Attended fishing clinic, derby or other event	15.7	7.7	9.57	2	** .002
Fished at trout farm or other fee fishing facility	18.9	15.8	1.15	2	.284
Fished while on school-related experience	12.6	6.3	7.20	2	** .007
Did water-related activities (boating, swimming)	87.7	88.9	0.26	2	.610
Fished at summer youth camp	21.5	11.8	10.77	2	*** <.001
Fished with local youth organization (scouts, etc.)	19.2	8.6	14.47	2	*** <.001
Camped with family	66.2	68.9	0.60	2	.438
Fished while camping with family	61.1	59.0	12.73	2	** .002
Events That Happened During Earliest Fishing Experience(s)					
Planned fishing trip	36.7	31.1	3.17	2	.204
Was afraid of fish or water	10.1	21.7	23.73	2	*** <.001
Enjoyed outdoors, water, wildlife	95.3	95.9	0.18	2	.916
Bothered by insects, bad weather	45.0	50.2	2.82	2	.225
Cast own lures, bait	81.7	79.9	3.10	2	.212
Had to follow rules (e.g., keep quiet)	60.2	52.3	5.01	2	.082
Caught big fish	68.1	63.9	1.47	2	.480
Handled fish	82.5	73.4	10.00	2	** .007
Caught lots of fish	73.6	64.7	7.45	2	* .024
Had problems with equipment	54.3	36.1	28.69	2	*** <.001
Ate fish caught	83.4	77.9	4.13	2	.127
Caught no fish	68.0	61.4	3.69	2	.158
Handled lures, bait	81.5	77.2	2.13	2	.345
Saw fish die	73.6	68.1	2.97	2	.226
Landed own fish	89.7	88.0	0.64	2	.726
Observed or did fish cleaning	86.1	76.7	12.70	2	** .002

Table 4-12. Activities done as a youth and events during earliest fishing experiences by residence area during youth of angler respondents.

Nature of Exposure Variable	Resident Area As Youth				χ^2	d.f.	p
	Rural-Farm %	Rural-nonfarm %	Small town %	Urban %			
Activities Done as a Youth							
Attended fishing clinic, derby or other event	8.4	9.8	19.4	15.4	19.78	3	*** <.001
Fished at trout farm or other fee fishing facility	16.2	16.7	19.7	19.8	2.32	3	.508
Fished while on school-related experience	10.4	7.5	13.8	11.2	5.22	3	.157
Did water-related activities (boating, swimming)	79.8	89.7	93.0	88.0	28.47	3	*** <.001
Fished at summer youth camp	15.5	17.7	22.3	21.0	5.92	3	.115
Fished with local youth organization (scouts, etc.)	13.0	14.5	18.4	19.8	7.02	3	.071
Camped with family	61.1	65.7	75.6	62.3	22.05	3	*** <.001
Fished while camping with family	55.1	62.8	68.1	57.0	30.57	3	*** <.001
Events That Happened During Earliest Fishing Experience(s)							
Planned fishing trip	31.0	36.7	37.2	35.4	8.57	6	.199
Was afraid of fish or water	12.1	6.0	12.0	14.0	8.01	6	.238
Enjoyed outdoors, water, wildlife	95.8	95.1	96.0	95.0	8.72	6	.189
Bothered by insects, bad weather	44.0	43.1	48.0	44.6	3.42	6	.755
Cast own lures, bait	77.7	84.1	80.3	83.5	11.32	6	.079
Had to follow rules (e.g., keep quiet)	56.5	53.6	57.7	63.6	16.98	6	** .009
Caught big fish	65.8	69.1	71.4	63.7	6.52	6	.367
Handled fish	77.1	87.0	80.5	82.3	8.54	6	.201
Caught lots of fish	68.8	71.2	72.9	73.5	10.72	6	.097
Had problems with equipment	46.6	50.0	52.0	52.6	9.04	6	.171
Ate fish caught	87.1	78.0	84.1	79.1	13.40	6	* .037
Caught no fish	63.9	69.1	65.9	67.9	2.13	6	.908
Handled lures, bait	76.9	87.2	79.6	82.1	8.11	6	.229
Saw fish die	66.2	78.9	72.3	74.3	11.43	6	.076
Landed own fish	89.6	86.6	88.1	91.4	8.59	6	.198
Observed or did fish cleaning	83.8	88.4	84.4	83.1	4.98	6	.546

Table 4-13. Activities done as a youth and events during earliest fishing experiences by family status/type during youth of angler respondents.

	Family status/type				χ^2	d.f.	p
	Single-parent						
	"Traditional" two parent (%)	Male-headed (%)	Female-headed (%)				
Activities Done as a Youth							
Attended fishing clinic, derby or other event	14.2	20.7	12.4	2.55	2	.279	
Fished at trout farm or other fee fishing facility	18.5	20.7	18.3	.19	2	.909	
Fished while on school-related experience	11.4	3.4	14.3	5.26	2	.072	
Did water-related activities (boating, swimming)	88.5	83.6	86.3	1.88	2	.392	
Fished at summer youth camp	19.9	19.7	19.7	.17	2	.918	
Fished with local youth organization (scouts, etc.)	17.7	15.8	15.8	.49	2	.784	
Camped with family	66.9	64.9	64.9	.72	2	.697	
Fished while camping with family	60.9	59.7	59.7	.97	2	.914	
Events That Happened During Earliest Fishing Experience(s)							
Planned fishing trip	34.6	32.8	42.1	9.26	4	*.054	
Was afraid of fish or water	11.6	11.9	14.7	6.34	4	.175	
Enjoyed outdoors, water, wildlife	95.1	96.5	96.4	3.22	4	.521	
Bothered by insects, bad weather	46.5	44.8	43.6	1.51	4	.824	
Cast own lures, bait	81.3	79.3	82.9	4.49	4	.344	
Had to follow rules (e.g., keep quiet)	59.1	47.4	61.1	5.04	4	.283	
Caught big fish	67.2	71.4	68.2	4.87	4	.301	
Handled fish	81.4	75.0	81.2	9.99	4	*.041	
Caught lots of fish	71.6	68.4	75.9	5.59	4	.231	
Had problems with equipment	52.1	37.3	51.6	4.99	4	.288	
Ate fish caught	83.0	81.0	80.2	1.03	4	.906	
Caught no fish	67.6	55.2	67.7	5.45	4	.245	
Handled lures, bait	81.7	70.2	79.5	5.94	4	.203	
Saw fish die	73.9	63.8	70.0	3.83	4	.429	
Landed own fish	90.2	84.5	87.0	3.88	4	.423	
Observed or did fish cleaning	85.6	74.1	83.9	9.74	4	*.045	

Table 4-14. Influence of early events and early fishing experiences on fishing interest by gender.

Nature of Exposure Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Did any single event during earliest experiences influence your fishing interest or participation today?					
Don't remember					
No	31.1	22.9	9.69	2	** .008
Yes	39.1	37.7			
	29.9	39.5			
Degree to which earliest experiences influenced level of fishing interest today					
Definitely	49.5	45.6	2.24	3	.525
Somewhat	29.4	30.7			
Little	16.8	20.2			
Don't remember	4.4	3.5			

Relationship of Antecedents and Exposure Agents to Age of Fishing Initiation

Males had a significantly earlier introduction to fishing than did females (Table 4-15); the average age of fishing introduction for males was 7.27 years, while the average age for females was over 9 years. Significant differences were also noted between anglers from different residence areas; those from rural-farm areas (mean 8.06 years) and urban areas (mean 7.73 years) had the latest introduction to fishing, whereas anglers from rural-nonfarm backgrounds had the earliest mean introduction (7 years). There were no differences in age of fishing introduction for anglers from traditional vs. single-parent homes.

For all anglers, age at fishing initiation decreased significantly with presence of immediate family members who fished, higher proportions of extended family members who fished, and higher levels of mother's and father's fishing activity (Table 4-16).

Table 4-15. Mean age of fishing introduction by gender, residence area during youth, and family status/type during youth of angler respondents.

Antecedent variables	N	Mean age of fishing introduction	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npar statistic	p
Sex									
Male	1112	7.27	.12	7.05 - 7.53					
Female	225	9.04	.42	8.21 - 9.87	27.54	*** <.001	*** <.001	-3.50 (a)	*** <.001
Residence Area as Youth									
Rural - farm	307	8.06	.29	7.49 - 8.63					
Rural - nonfarm	177	7.00	.30	6.41 - 7.59					
Small town/suburban	390	7.27	.22	6.83 - 7.71					
Urban	451	7.73	.22	7.30 - 8.16	2.82	* .038	*** <.001	7.63 (b)	* .054
Family Status/Type									
"Traditional" two-parent	1058	7.64	.38	7.36 - 7.92					
Single parent - male headed	62	6.68	.33	5.91 - 7.45					
Single parent - female headed	205	7.58	.14	6.92 - 8.23	1.26	.283	*** <.001	1.85 (b)	.395

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test)

Table 4-16. Mean age of first fishing experience by presence of exposure agents.

Exposure Agent Variables	N	Mean age of first fishing (years)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npar statistic	p
Did anyone in immediate family fish?	247	12.20	.45	11.32 - 13.08	393.11	***<.001	***<.001	-15.36 (a)	***<.001
No	1059	6.50	.09	6.32 - 6.68					
Yes									
Proportion of extended family who fished	135	13.47	.70	12.07 - 14.86					
No one	382	7.83	.19	7.46 - 8.20					
Fewer than half	250	6.48	.21	6.07 - 6.89					
At least half	245	5.71	.14	5.43 - 5.99					
Most	173	5.75	.20	5.36 - 6.14	98.66	***<.001	***<.001	(b) 218.05	***<.001
Everyone									
Level of Mother's Fishing Activity	636	8.94	.22	8.50 - 9.38					
Did not fish	346	6.07	.14	5.79 - 6.35					
Occasionally fished	170	5.72	.19	5.34 - 6.10	61.80	***<.001	***<.001	(b) 130.76	***<.001
Regularly fished									
Level of Father's Fishing Activity	291	11.70	.41	10.90 - 12.49					
Did not fish	325	6.99	.15	6.70 - 7.28					
Occasionally fished	598	5.86	.10	5.66 - 6.06	208.79	***<.001	***<.001	(b) 283.51	***<.001
Regularly fished									

(a) z statistic (Mann-Whitney U test)
 (b) χ^2 (Kruskal-Wallis test)

Relationships of Antecedents to Childhood, Teen and Current Fishing Involvement

Antecedent variables of sex, residence area as a youth and family type ("traditional" vs. single-parent) were related to anglers' levels of childhood, teen and current fishing commitment. By far, the strongest relationships existed for sex (male vs. female) and fishing commitment. Males had significantly greater childhood and teen fishing involvement (fishing activity level, greater importance of fishing, and greater frequency of watching fishing shows, talking with friends, reading viewing pictures and obtaining own fishing equipment) (Tables 4-17, 4-18). Also, more males than females reported they increased their fishing activity level in teen years; 51% of males reported an increase in activity in teens, whereas only 30% of females had an increase (Table 4-18). Over one-third of females reported a decrease of fishing activity in teen years.

Residence area during youth did not appear to be strongly related to either childhood or teen involvement in fishing (Tables 4-19 and 4-20). Although more anglers from rural-farm and urban areas reported that they did not fish in childhood, these differences were not statistically significant. The only difference among residence area groups in childhood was in the proportion who frequently watched fishing or outdoor shows on television; persons from small towns more frequently reported watching these shows in childhood, and those from rural-nonfarm areas least frequently reported doing so (Table 4-19). In teen years, however, differences were apparent among anglers who grew up in various residence areas. Significantly fewer anglers from rural-farm and urban areas fished frequently or very frequently in teen years (Table 4-20), although significantly more anglers from urban areas (51%) than all other areas reported their fishing activity increased in teen years. Over 23% of anglers from small-town backgrounds reported decreased fishing activity in teen years, perhaps due to competing activities available to teens in these areas. Finally, significantly fewer respondents from urban areas than from all other areas reported that they had talked with friends about fishing during teen years.

Family type ("traditional" vs. single-parent) during youth was not significantly related to childhood or teen fishing activity level or importance (Tables 4-21 and 4-22). This antecedent variable was, however, related to some particular aspects of childhood and teen fishing involvement. In childhood years, more anglers from traditional (two-parent) families than from single-parent homes reported that they talked with friends about fishing and obtained their own fishing equipment (Table 4-21). Anglers from female-headed households, however, more frequently than others viewed pictures of fishing outings during childhood. In teen years, anglers from female-headed, single-parent households more frequently reported they watched fishing or outdoor tv shows, but the differences among groups were small (Table 4-22). Also in teen years, anglers from male-headed single parent families more frequently than all others read about fishing or viewed pictures of fishing.

High involvement anglers did not differ significantly from low- or moderate-involvement anglers in residence area or family type while growing up (Table 4-23), although slightly more low involvement anglers were from small town or urban residence areas and from "traditional" families. Less than 7% of high involvement anglers were female, whereas 26% of low involvement anglers were female (Table 4-23).

Table 4-17. Childhood fishing commitment by gender of angler respondents.

Childhood Fishing Commitment Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Childhood Fishing Activity Level					
Did not fish	7.8	14.1			
Tried fishing once or twice	5.4	9.5			
Fished occasionally	38.6	37.3			
Fished often	21.3	20.5			
Fished frequently	12.9	7.7			
Fished very frequently	7.4	6.4			
Don't remember	6.6	4.5	18.91	6	** .004
Importance of fishing in Childhood					
Most important recreation activity	6.9	4.5			
More important than most activities	19.7	9.9			
Important	25.8	17.5			
Somewhat important	16.0	19.3			
Slightly important	16.2	18.8			
Not at all important	15.4	30.0	41.19	5	*** <.001
Proportion agreeing that statement describes childhood fishing involvement:					
Usually watch fishing or outdoor shows on TV	27.6	16.4	19.01	5	** .002
Often talk with friends about fishing	43.0	20.3	68.81	5	*** <.001
Frequently read about fishing	21.9	6.8	56.33	5	*** <.001
Often viewed pictures of fishing outings	36.8	22.7	25.81	5	*** <.001
Requested or purchased own fishing equipment	49.7	31.2	77.83	5	*** <.001

Table 4-18. Teen fishing commitment by gender of angler respondents.

Teen Fishing Commitment Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Teen Fishing Activity Level					
Did not fish	3.0	8.6			
Tried fishing once or twice	3.6	4.1			
Fished occasionally	27.4	40.3			
Fished often	23.7	19.9			
Fished frequently	23.2	14.9			
Fished very frequently	18.2	10.4			
Don't remember	0.9	1.8	39.84	6	*** <.001
Did Fishing Activity Level Change in Teens?					
Higher in teens	51.0	30.0			
Lower in teens	18.1	33.2			
About the same	31.0	36.8	39.83	2	*** <.001
Importance of fishing in Teens					
Most important recreation activity	4.9	2.7			
More important than most activities	21.0	9.4			
Important	31.2	18.8			
Somewhat important	17.8	22.9			
Slightly important	14.7	22.9			
Not at all important	10.4	23.3	59.99	5	*** <.001
Proportion agreeing that statement describes Teen fishing involvement:					
Usually watch fishing or outdoor shows on TV	39.0	15.1	52.64	5	*** <.001
Often talk with friends about fishing	50.6	15.9	128.90	5	*** <.001
Frequently read about fishing	38.8	10.3	109.32	5	*** <.001
Often viewed pictures of fishing outings	40.9	23.5	53.78	5	*** <.001
Requested or purchased own fishing equipment	73.4	33.2	160.94	5	*** <.001

Table 4-19. Childhood fishing commitment by residence area during youth of angler respondents.

Childhood Fishing Commitment Variable	Residence Area As Youth					χ^2	d.f.	p
	Rural - farm (%)	Rural - nonfarm (%)	Small town (%)	Urban (%)				
Childhood Fishing Activity Level								
Did not fish	11.4	4.6	6.6	10.9				
Tried fishing once or twice	6.7	5.7	5.3	6.3				
Fished occasionally	36.4	38.9	36.9	41.4				
Fished often	19.5	19.4	23.1	20.8				
Fished frequently	12.5	14.3	14.1	8.8				
Fished very frequently	6.7	10.3	8.5	5.0				
Don't remember	6.7	6.9	5.6	6.8		26.34	18	.092
Importance of fishing in Childhood								
Most important recreation activity	6.9	7.4	6.4	5.5				
More important than most activities	19.7	22.2	17.5	14.8				
Important	24.6	25.6	26.0	22.5				
Somewhat important	15.4	14.2	17.2	18.0				
Slightly important	12.1	14.2	18.8	19.1				
Not at all important	21.3	16.5	14.1	20.2		21.82	15	.113
Proportion agreeing that statement describes childhood fishing involvement:								
Usually watch fishing or outdoor shows on TV	24.1	21.7	28.2	24.9		27.04	15	* .028
Often talk with friends about fishing	36.6	45.2	41.1	35.2		19.49	15	.192
Frequently read about fishing	20.0	21.0	19.4	16.7		21.81	15	.113
Often viewed pictures of fishing outings	32.5	38.0	32.9	33.2		10.53	15	.785
Requested or purchased own fishing equipment	44.4	47.2	47.2	49.3		10.38	15	.795

Table 4-20. Teen fishing commitment by residence area during youth of angler respondents.

Teen Fishing Commitment Variable	Residence Area As Youth					χ^2	d.f.	p
	Rural - farm (%)	Rural - nonfarm (%)	Small town (%)	Urban (%)				
Teen Fishing Activity Level								
Did not fish	4.9	2.3	3.7	4.3				
Tried fishing once or twice	4.3	2.3	2.1	5.1				
Fished occasionally	30.3	24.3	27.6	34.2				
Fished often	22.7	21.5	24.2	23.9				
Fished frequently	20.4	30.5	20.3	18.8				
Fished very frequently	15.8	19.2	20.8	12.8				
Don't remember	1.6	0.0	1.3	0.9		35.13	18	** .009
Did Fishing Activity Level Change in Teens?								
Higher in teens	44.2	41.2	47.9	51.1				
Lower in teens	17.3	20.3	23.6	21.4				
About the same	38.5	38.4	28.5	27.5		17.34	6	** .008
Importance of fishing in Teens								
Most important recreation activity	4.9	5.1	3.6	4.9				
More important than most activities	16.7	20.8	17.4	20.0				
Important	32.8	32.0	32.6	23.4				
Somewhat important	19.0	18.5	19.3	18.0				
Slightly important	12.1	14.0	15.6	19.8				
Not at all important	14.4	9.6	11.5	13.9		21.79	15	.114
Proportion agreeing that statement describes Teen fishing involvement:								
Usually watch fishing or outdoor shows on TV	30.9	29.8	35.7	37.4		21.16	15	.132
Often talk with friends about fishing	45.2	50.3	46.5	39.9		25.61	15	* .042
Frequently read about fishing	37.3	37.3	33.0	29.9		16.18	15	.370
Often viewed pictures of fishing outings	39.4	42.0	34.3	37.2		13.40	15	.571
Requested or purchased own fishing equipment	67.4	64.4	67.0	66.5		16.52	15	.348

Table 4-21. Childhood fishing commitment by family status/type during youth of angler respondents.

	Family status/type							
		Single-parent						
Childhood Fishing Commitment Variable	"Traditional " two- parent (%)	Male- headed (%)	Female- headed (%)	χ^2	d.f.	p		
Childhood Fishing Activity Level								
Did not fish	8.6	6.6	11.1					
Tried fishing once or twice	5.8	4.9	7.6					
Fished occasionally	39.8	37.7	31.8					
Fished often	21.3	16.4	21.2					
Fished frequently	11.7	16.4	12.1					
Fished very frequently	6.6	9.8	10.1					
Don't remember	6.3	8.2	6.1	10.90	12	.537		
Importance of fishing in Childhood								
Most important recreation activity	5.7	9.8	8.8					
More important than most activities	18.8	23.0	13.2					
Important	24.8	18.0	24.5					
Somewhat important	16.8	19.7	14.7					
Slightly important	16.5	16.4	17.6					
Not at all important	17.3	13.1	21.1	11.72	10	.304		
Proportion agreeing that statement describes childhood fishing involvement:								
Usually watch fishing or outdoor shows on TV	25.6	23.4	26.2	16.54	10	.085		
Often talk with friends about fishing	39.4	40.9	36.4	15.90	10	.102		
Frequently read about fishing	20.0	15.0	16.4	19.93	10	* .030		
Often viewed pictures of fishing outings	33.4	36.1	39.3	23.13	10	** .010		
Requested or purchased own fishing equipment	47.5	44.3	43.0	23.75	10	** .008		

Table 4-22. Teen fishing commitment by family status/type during youth of angler respondents.

Teen Fishing Commitment Variable	Family status/type			χ^2	d.f.	p
	"Traditional" two- parent (%)	Single-parent Male- headed (%)	Female- headed (%)			
Teen Fishing Activity Level						
Did not fish	4.2	0.0	4.4			
Tried fishing once or twice	3.8	1.6	2.9			
Fished occasionally	28.9	32.8	31.9			
Fished often	23.5	23.0	21.6			
Fished frequently	22.4	21.3	18.6			
Fished very frequently	16.2	18.0	19.6			
Don't remember	0.9	3.3	1.0	9.95	12	.620
Did Fishing Activity Level Change in Teens?						
Higher in teens	47.2	47.6	49.3			
Lower in teens	20.4	17.5	22.4			
About the same	32.4	34.9	28.3	1.91	4	.752
Importance of fishing in Teens						
Most important recreation activity	4.3	6.6	5.4			
More important than most activities	18.4	19.7	22.5			
Important	30.4	26.2	22.5			
Somewhat important	18.5	21.3	19.1			
Slightly important	15.1	18.0	20.1			
Not at all important	13.3	8.2	10.3	11.61	10	.312
Proportion agreeing that statement describes Teen fishing involvement:						
Usually watch fishing or outdoor shows on TV	34.9	33.4	35.3	20.41	10	* .026
Often talk with friends about fishing	44.3	42.6	47.8	13.25	10	.210
Frequently read about fishing	34.7	36.1	29.7	24.39	10	** .007
Often viewed pictures of fishing outings	38.0	42.7	36.3	35.38	10	***<.001
Requested or purchased own fishing equipment	66.8	70.0	65.3	12.02	10	.284

Table 4-23. Proportions of low, moderate, and high involvement anglers of either sex, and who grew up in rural vs. urban areas, and who were from traditional vs. single-parent families.

	% of Angler Involvement Type...						
Antecedent Variable	Low	Latent	Spurious	High	χ^2	d.f.	p
Sex: Male	74.0	84.4	81.8	93.1	61.48	3	*** <.001
Female	26.0	15.6	18.2	6.9			
Residence as a youth					6.29	9	.710
Rural - farm	20.0	22.8	24.3	26.1			
Rural - nonfarm	13.6	12.4	15.3	13.2			
Small town/suburban	31.3	32.6	27.8	28.3			
Urban	35.2	32.1	32.6	32.4			
Family type					9.59	6	.143
Single parent:							
Male headed	3.4	2.1	6.1	5.9			
Female headed	13.6	15.4	18.2	15.7			
Traditional	83.0	82.6	75.7	78.4			

Males and females were significantly different in all current fishing involvement variables except intention to purchase a fishing license in the next year (Tables 4-24, 4-25, and 4-30). Females had less consistent fishing activity over the past five years; fewer females than males had fished all of the past five years or purchased a license over that time (Table 4-24). While fewer females than males intend to fish in the next license year, the majority of respondents reported that they intend to do so. Over 47% of males consider fishing as more important than most activities or their most important recreational activity, but only about 29% of females rate fishing this high in importance (Table 4-24). Males averaged about 39 days per year fishing, but females averaged 20 days (Table 4-30). About half as many females as men currently watch fishing or outdoor shows on tv, visit stores to view new equipment, read about fishing, talk with friends about fishing, spend money on fishing, or maintain membership in a fishing organization (Table 4-25). Significantly fewer females agreed with the statements "Fishing says a lot about who I am," "A lot of my life is organized around fishing," and "My enjoyment of fishing influences where I live" (Table 4-25).

Anglers from different residence areas while growing up were alike in all current fishing involvement measures except one (Tables 4-26, 4-27 and 4-30). Those who grew up in urban areas more frequently than others reported they currently maintain membership in fisheries organizations today (Table 4-27).

Anglers who had grown up in different family types were alike in all current fishing involvement variables except one (Tables 4-28, 4-29 and 4-30). Those from traditional two-parent families were different from anglers from single-parent families in the total number of days per year of fishing activity. Interestingly, anglers who had grown up in male-headed, single-parent families fished the most days per year (mean of about 48 days per year), followed by anglers from single-parent, female headed households (mean of 39 days/year), and then by anglers from "traditional" families (mean of 34.5 days per year) (Table 4-30).

Table 4-24. Current fishing involvement by gender of angler respondents.

Current Fishing Involvement Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Consistency of Fishing Activity					
Years purchased fishing license (of past 5 years):					
0 years	0.7	2.2			
1-2 years	10.3	22.9			
3-4 years	17.5	28.6			
5 years	71.5	46.3	59.35	3	*** <.001
Years fished (of past 5 years):					
0 years	0.4	1.7			
1-2 years	7.3	16.3			
3-4 years	15.5	23.6			
5 years	76.8	58.4	39.07	3	*** <.001
Fishing Intentions					
Intend to purchase license in 1993-94	92.8	88.6	4.80	2	.091
Intend to go fishing in 1993-94	84.3	71.0	24.87	4	*** <.001
Interested in Going Fishing More Often	91.6	86.1	6.94	1	** .008
Current Importance of Fishing					
Most important recreation activity	15.3	10.0			
More important than most activities	32.0	19.5			
Important	30.5	36.8			
Somewhat important	11.0	16.9			
Slightly important	8.7	13.0			
Not at all important	2.5	3.9	26.71	5	*** <.001

Table 4-25. Current fishing commitment (commitment scale items) by gender of angler respondent.

Current Fishing Commitment Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Proportion Agreeing that Statement Describes Current Fishing Involvement:					
Frequently watch fishing or outdoor shows on TV	60.6	33.1	28.13	4	*** <.001
Frequently visit stores to view new equipment	56.9	26.0	88.91	4	*** <.001
Frequently read about fishing	50.0	21.4	90.42	4	*** <.001
Fishing says alot about who I am	33.5	18.2	29.25	4	*** <.001
Often talk to friends about fishing	65.5	38.7	68.61	4	*** <.001
Spend great deal of money on fishing	29.8	15.9	37.90	4	*** <.001
A lot of my life is organized around fishing	19.2	9.0	41.52	4	*** <.001
My enjoyment of fishing influences where I live	25.1	19.4	15.11	4	** .004
Maintain membership in fisheries organization	17.3	7.3	33.89	4	*** <.001
My enjoyment of fishing influences vacation destinations	51.8	45.5	7.12	4	.130
Own recreational property close to fishing	19.4	18.1	5.63	4	.228

Table 4-26. Current fishing involvement by residence area during youth of angler respondents.

Current Fishing Involvement Variable	Residence Area As Youth					χ^2	d.f.	p
	Rural - farm (%)	Rural - nonfarm (%)	Small town (%)	Urban (%)				
Consistency of Fishing Activity								
Years purchased fishing license (of past 5 years):								
0 years	0.6	1.1	0.8	1.1				
1-2 years	9.9	12.4	13.5	13.2				
3-4 years	15.4	20.2	19.3	22.6				
5 years	74.0	66.3	66.4	63.2		11.01	9	.275
Years fished (of past 5 years):								
0 years	0.3	0.0	0.5	1.1				
1-2 years	7.4	6.2	9.2	10.3				
3-4 years	12.3	17.5	17.6	19.7				
5 years	80.0	76.3	72.8	68.9		16.03	9	.066
Fishing Intentions								
Intend to purchase license in 1993-94	93.2	92.6	91.2	92.7		2.21	6	.899
Intend to go fishing in 1993-94	84.1	84.2	81.3	80.9		3.74	12	.988
Interested in Going Fishing More Often	89.4	93.1	88.7	92.5		5.51	3	.138
Current Importance of Fishing								
Most important recreation activity	15.4	12.6	11.9	16.3				
More important than most activities	31.1	30.9	31.0	28.0				
Important	33.3	32.6	31.5	29.5				
Somewhat important	9.9	13.1	13.2	12.8				
Slightly important	9.3	9.1	8.8	10.4				
Not at all important	1.0	1.7	3.6	3.1		13.57	15	.558

Table 4-27. Current fishing commitment (commitment scale items) by residence area during youth of angler respondent.

Current Fishing Commitment Variable	Residence Area As Youth				χ^2	d.f.	p
	Rural-farm (%)	Rural-nonfarm (%)	Small town (%)	Urban (%)			
Proportion Agreeing that Statement Describes Current Fishing Involvement							
Frequently watch fishing or outdoor shows on TV	60.4	53.5	54.5	59.7	9.10	12	.694
Frequently visit stores to view new equipment	51.6	54.4	52.8	49.4	14.54	12	.268
Frequently read about fishing	48.3	43.6	45.8	41.4	14.11	12	.294
Fishing says alot about who I am	31.1	31.4	31.2	29.9	14.79	12	.253
Often talk to friends about fishing	64.4	58.2	62.6	57.9	20.41	12	.060
Spend great deal of money on fishing	30.6	26.8	23.8	28.0	15.71	12	.204
A lot of my life is organized around fishing	16.8	15.7	18.5	17.1	13.70	12	.320
My enjoyment of fishing influences where I live	27.4	27.3	22.3	21.9	12.16	12	.433
Maintain membership in fisheries organization	14.9	13.4	15.3	17.0	29.77	12	** .003
My enjoyment of fishing influences vacation destinations	51.5	51.7	47.2	51.8	7.09	12	.851
Own recreational property close to fishing	19.4	20.5	16.6	20.9	15.81	12	.199

Table 4-28. Current fishing involvement by family status/type during youth of angler respondents.

	Family status/type							
		Single-parent						
Current Fishing Involvement Variable	"Traditional" two-parent (%)	Male- headed (%)	Female- headed (%)	χ^2	d.f.	p		
Consistency of Fishing Activity Years purchased fishing license (of past 5 years): 0 years 1-2 years 3-4 years 5 years Years fished (of past 5 years): 0 years 1-2 years 3-4 years 5 years	1.0	1.6	0.5	3.86	6	.696		
	12.8	9.7	12.3					
	18.5	17.7	23.2					
	67.7	71.0	64.0					
	0.7	0.0	0.5	1.63	6	.950		
	9.1	6.5	8.5					
	16.7	14.5	17.5					
	73.4	79.0	73.5					
	Fishing Intentions Intend to purchase license in 1993-94 Intend to go fishing in 1993-94	91.9	93.7	92.3	1.30	4		.862
		81.8	85.7	82.3	2.65	8		.954
		90.0	87.3	94.8	5.56	2		.062
	Current Importance of Fishing Most important recreation activity More important than most activities Important Somewhat important Slightly important Not at all important	14.2	14.5	14.8	8.99	10		.533
29.0		35.5	32.1					
31.6		25.8	34.0					
13.1		12.9	6.7					
9.4		9.7	9.1					
2.7		1.6	3.3					

Table 4-29. Current fishing commitment (commitment scale items) by family status/type during youth of angler respondent.

	Family status/type					
	Single-parent					
Current Fishing Commitment Variable	"Traditio- nal" two- parent (%)	Male- headed (%)	Female- headed (%)	χ^2	d.f.	p
Proportion Agreeing that Statement Describes Current Fishing Involvement:						
Frequently watch fishing or outdoor shows on TV	57.6	59.0	56.1	3.87	8	.869
Frequently visit stores to view new equipment	50.6	60.7	53.7	7.05	8	.531
Frequently read about fishing	44.2	50.8	46.0	3.44	8	.904
Fishing says alot about who I am	30.4	35.0	32.2	7.58	8	.475
Often talk to friends about fishing	61.1	58.3	59.3	1.74	8	.988
Spend great deal of money on fishing	27.6	34.4	25.6	5.99	8	.649
A lot of my life is organized around fishing	17.3	28.4	15.2	10.61	8	.225
My enjoyment of fishing influences where I live	23.8	27.9	25.0	4.31	8	.829
Maintain membership in fisheries organization	15.8	16.4	15.3	7.67	8	.467
My enjoyment of fishing influences vacation destinations	49.7	57.4	52.7	7.95	8	.438
Own recreational property close to fishing	18.1	28.3	22.2	8.45	8	.391

Table 4-30. Mean total days fishing per year by gender, residence area during youth, and family status/type during youth of angler respondents.

Antecedent variables	N	Mean total days fishing per year	S.E.	95% C.I.	F ratio	p	Homogeneity variances (p)	npar statistic	p
Sex									
Male	1060	38.96	1.23	36.54 - 41.37					
Female	206	20.01	1.70	16.66 - 23.36	43.02	*** <.001	*** <.001	-7.54 (a)	*** <.001
Residence Area as Youth									
Rural - farm	287	38.01	2.21	33.66 - 42.36					
Rural - nonfarm	166	34.75	2.79	29.24 - 40.27					
Small town/suburban	370	35.96	2.02	31.99 - 39.94					
Urban	412	33.02	1.81	29.46 - 36.58	1.06	.366	.424		—
Family Status/Type									
"Traditional" two-parent	1008	34.52	1.18	32.19 - 36.84					
Single parent - male headed	56	47.98	5.50	36.95 - 59.01					
Single parent - female headed	191	39.46	3.03	33.46 - 45.45	4.23	** .015	.202		—

(a) z statistic (Mann-Whitney U test)

Relationships between Age of Fishing Initiation and Fishing Involvement

A person's age at the time of his/her first fishing experience appears to be related to early fishing satisfaction, childhood and teen fishing involvement, and current fishing involvement (Tables 4-31 to 4-34). Anglers introduced to fishing while 5 years old or younger reported the greatest mean satisfaction with their early fishing experiences (Table 4-31). Anglers introduced during their teen years had the lowest mean satisfaction. Respondents introduced to fishing while 5 years old or younger reported significantly greater mean importance of fishing and fishing activity level in childhood and teen years than did those who had later initiation into fishing (Tables 4-32 and 4-33).

Likewise, high involvement anglers had the earliest fishing introduction (Table 4-34). Over 46% of high involvement anglers began fishing by age 5, whereas only 34.1% of low involvement anglers had such an early start (Table 4-34). Those anglers with the youngest initiation into fishing reported significantly higher current fishing activity and importance than did those anglers with later introduction (Table 4-35). In fact, those anglers who reported that they began fishing when 5 years old or younger fished an average of about 40 days per year, whereas those who began fishing as adults fish an average of only about 27 days per year (Table 4-35).

There were some relationships between age of fishing initiation and the effects of catch-related experiences on subsequent interest in fishing (Table 4-36). Young recruits (age 5 or younger) more frequently than other groups reported that catching lots of fish during their earliest experiences increased their interest in fishing at that time, whereas about 36% of adult recruits reported that catching lots of fish had no effect on interest. Young recruits also more often than older recruits reported that catching big fish increased their fishing interest; catching big fish had little or no effect on subsequent fishing interest of individuals who began fishing as adults. More 11-18 year-old recruits than other recruitment age groups reported that catching no fish decreased their overall fishing interest; teens apparently want catch-related results when they go fishing! Perhaps size and quantity of fish caught is a matter of

perception, and it is easier to impress younger recruits with smaller fish! Furthermore, quantity and size of fish are concrete, observable fishing outcomes for youth who are in earlier stages of cognitive development.

Table 4-31. Mean satisfaction with early fishing experience by age at fishing initiation.

Age at first fishing experience	N	Mean satisfaction	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2	p
SATISFACTION ITEM #1 (1=strongly agree that thoroughly enjoyed, 5=strongly disagree) Age at first fishing:									
	≤ 5 years	1.51	.04	1.44 - 1.58					
	6-10 years	1.67	.04	1.60 - 1.74					
	11-18 years	1.96	.10	1.77 - 2.14					
	> 18 years	1.52	.10	1.31 - 1.73	9.96	***<.001	***<.001	30.44	***<.001
SATISFACTION ITEM #2 (1=strongly agree that early trips not as enjoyable as expected, 5=strongly disagree) Age at first fishing:									
	≤ 5 years	4.32	.04	4.24 - 4.40					
	6-10 years	4.07	.04	3.99 - 4.14					
	11-18 years	3.77	.12	3.53 - 4.01					
	> 18 years	3.76	.20	3.35 - 4.17	12.85	***<.001	***<.001	35.89	***<.001

(b) X2 (Kruskal-Wallis test)

Table 4-32. Mean importance of fishing and fishing activity level in childhood by age of first fishing experience.

Age at first fishing experience	N	Mean	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2 (c)	p
IMPORTANCE OF FISHING IN CHILDHOOD (a)									
Age at first fishing:									
≤ 5 years	525	3.90	.06	3.78 - 4.02					
6-10 years	621	3.19	.06	3.08 - 3.31					
11-18 years	117	1.68	.10	1.47 - 1.88					
> 18 years	41	1.15	.07	0.99 - 1.30	127.54	***<.001	***<.001	288.08	***<.001
FISHING ACTIVITY LEVEL IN CHILDHOOD (b)									
Age at first fishing:									
≤ 5 years	523	3.07	.05	2.98 - 3.16					
6-10 years	574	2.35	.04	2.26 - 2.43					
11-18 years	85	.51	.10	0.32 - 0.70					
> 18 years	38	.00	.00	0 - 0	241.54	***<.001	***<.001	389.87	***<.001

(a) Mean importance where 1=not at all important, 6=most important recreation activity.

(b) Mean activity level where 0=did not fish, 1=tired fishing once or twice, 2=fished occasionally, 3=fished often, 4=fished frequently, 5=fished very frequently.

(c) χ^2 (Kruskal-Wallis test)

Table 4-33. Mean importance of fishing and fishing activity level in teen years by age of first fishing experience.

Age at first fishing experience	N	Mean	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2 (c)	p
IMPORTANCE OF FISHING IN TEENS (a)									
Age at first fishing:									
≤ 5 years	526	3.75	.06	3.63 - 3.86					
6-10 years	621	3.35	.05	3.24 - 3.46					
11-18 years	125	2.92	.13	2.67 - 3.17					
> 18 years	43	1.30	.13	1.05 - 1.56	53.47	***<.001	***<.001	127.62	***<.001
FISHING ACTIVITY LEVEL IN TEENS (b)									
Age at first fishing:									
≤ 5 years	525	3.45	.05	3.53 - 3.55					
6-10 years	612	3.03	.05	2.94 - 3.13					
11-18 years	121	2.50	.11	2.29 - 2.72					
> 18 years	42	0.31	.12	0.07 - 0.55	106.85	***<.001	** .005	179.28	***<.001

(a) Mean importance where 1=not at all important, 6=most important recreation activity.

(b) Mean activity level where 0=did not fish, 1=tried fishing once or twice, 2=fished occasionally, 3=fished often, 4=fished frequently, 5=fished very frequently.

(c) X² (Kruskal-Wallis test)

Table 4-34. Age of first fishing experience of low, moderate, and high involvement anglers.

Age of first fishing	% of Angler Involvement Type...				χ^2	d.f.	p
	Low	Latent	Spurious	High			
Less than 5 years	34.1	39.5	43.0	46.1	22.22	9	** .008
6-10 years old	50.0	48.7	43.0	45.0			
11-18 years old	11.3	6.7	11.3	6.2			
Over 18 years old	4.6	5.1	2.8	2.8			

Table 4-35. Mean current importance of fishing and fishing activity level by age of first fishing experience.

Age at first fishing experience	N	Mean	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2 (b)	p
CURRENT IMPORTANCE OF FISHING (a)									
Age at first fishing:									
≤ 5 years	521	4.31	.05	4.21 - 4.41					
6-10 years	633	4.16	.05	4.06 - 4.35					
11-18 years	125	4.11	.12	3.87 - 4.35					
> 18 years	52	3.90	.18	3.54 - 4.27	2.79	* .039	.087	7.79	* .048
TOTAL DAYS FISHING PER YEAR (CURRENT)									
Age at first fishing:									
≤ 5 years	502	40.35	1.83	36.75 - 43.94					
6-10 years	584	33.74	1.52	30.76 - 36.73					
11-18 years	107	29.77	3.32	23.18 - 36.35					
> 18 years	47	26.72	5.10	16.45 - 36.99	4.70	** .003	** .002	16.70	*** <.001

(a) Mean importance where 1=not at all important and 6=most important recreational activity.

(b) X2 (Kruskal-Wallis test)

Table 4-36. Percent of anglers starting fishing at different ages and their catch-related early fishing experiences.

Catch-related experiences	Age of first fishing experience - % who started at age..				χ^2	d.f.	p
	≤ 5 years	6-10 years	11-18 years	> 18 years			
Caught no fish?							
No	23.3	29.7	31.9	41.9			
Yes	71.0	65.5	59.5	53.5	14.41	6	* .025
Don't remember	5.7	4.8	8.6	4.7			
Caught lots of fish?							
No	14.8	26.3	36.0	38.6			
Yes	79.9	69.1	57.9	61.4			
Don't remember	5.3	4.6	6.1	0	41.45	6	*** <.001
Caught big fish?							
No	19.8	32.3	37.6	45.5			
Yes	75.8	63.8	54.7	54.5			
Don't remember	4.4	3.9	7.7	0	39.36	6	*** <.001
Did catching no fish affect your fishing interest?							
Decreased interest	16.6	24.1	34.6	19.4			
No effect	78.1	70.0	55.6	77.8	20.85	6	** .002
Increased interest	5.3	5.8	9.9	2.1			
Did catching lots of fish affect your fishing interest?							
Decreased interest	0.5	1.5	7.1	5.6			
No effect	18.7	22.7	14.1	36.1	31.93	6	*** <.001
Increased interest	80.8	75.8	78.8	58.3			
Did catching big fish affect your fishing interest?							
Decreased interest	0.2	1.3	2.6	5.9			
No effect	12.8	18.7	16.9	23.5	19.49	6	** .003
Increased interest	86.9	80.0	80.5	70.6			

Differences Among Age Cohorts

When respondents are considered in age cohort groups, differences in fishing antecedents, socialization and outcomes are apparent, perhaps reflecting different socialization processes in operation for each age cohort. Significantly higher proportions of females were present in the 25-34-year-old (young Baby Boomer) and 55-64-year-old (Depression Era) cohorts (Table 4-37) than in any other age cohort. Age cohorts also differed in residence during youth, with the highest proportions of anglers from rural-farm backgrounds in the older age cohorts (Table 4-37). The WWI Generation (ages 65+) and Baby Bust cohort (ages 19-24) had the highest incidences of single-parent family status (Table 4-37).

Age cohorts differed on several fishing exposure agent variables. Significantly fewer 65+-year-olds than other age groups had immediate family members who fished while they were growing up (Table 4-38). Significantly more 19-24-year-olds than any other cohort reported that their mothers fished and that higher proportions of extended family members who fished while they were growing up (Table 4-38). The WWII Generation (ages 45-54) and the WWI Generation (ages 65+) reported the lowest frequency of mothers who fished while growing up, reflecting the changing participation level of women in outdoor recreation over the decades (Table 4-38). Age cohorts also differed in proportion reporting fathers who fished; 19-34-year-olds significantly more frequently reported that their fathers fished while growing up, while those age 65+ had the lowest frequency of fathers who fished (Table 4-38).

Over 60% of 19-34-year-olds reported that certain important people had influenced their fishing interest and participation, whereas only 35% of 65+-year-olds reported such personal influence (Table 4-39). Baby Boomers (ages 25-44) somewhat more frequently than other age groups reported that a specific event had influenced their fishing interest and participation (Table 4-39). Over 50% of 45+-year-olds reported that their early experiences definitely influenced their fishing interest and participation today (Table 4-39). Important to note, however, is that the frequency of "Don't remember" responses to these fishing influence questions increased

significantly with age, although there was no significant difference among the age groups in self-reported completeness and accuracy of memory of first fishing experience(s) (Table 4-39).

Age cohorts differed significantly in the proportion who had done certain fishing-related activities as youths. Respondents in the younger age cohorts more frequently reported they had done the following activities as youths: attended a fishing clinic or derby, fished at a trout farm or other fee fishing facility, fished as part of a school-related experience, participated in water-related activities, fished at a youth camp, camped with family, and fished while camping with family (Table 4-40). Participation rates for Baby Bust cohort members in most of these activities was more than double that of WWI Generation members. Separate analysis of participation rates of female age cohorts showed that increased opportunities have not been available to successive generations of females; the only activities which have had increasing participation by females are participation in water-related activities, camping with family, and fishing while camping with family (Table 4-41). Apparently females have not taken part in increasing proportions in many institutionally-sponsored fishing exposure events over the decades.

Younger cohorts reported significantly greater participation in fishing during childhood and teen years than did older age cohorts (Tables 4-42 and 4-43). Age cohorts also differed in importance of fishing during childhood and teen years. There may recall bias among respondents, however, with younger cohorts remembering level of fishing participation in youth better than older cohorts. Not surprisingly childhood and teen exposure to outdoor or fishing-related television shows increased significantly through the decades (Tables 4-42 and 4-43). Baby Boomers (ages 35-44) had significantly greater proportions of low involvement anglers than any other age group (Table 4-44), perhaps reflecting family and work-related constraints to fishing during that period in the life cycle. The proportion of latent anglers increased with age (Table 4-44).

Table 4-38. Differences among age cohorts in fishing exposure agents

Exposure Agent Variable	Baby bust		Baby boom		WWII	Depression	WWI	χ^2	d.f.	p
	19-24 %	25-34 %	35-44 %	45-54 %						
Did anyone in immediate family fish?										
No	9.1	8.7	22.6	20.7		26.3	34.0			
Yes	90.9	91.3	77.4	79.3		73.8	66.0	51.71	5	*** <.001
Proportion of extended family who fished										
No one	2.4	4.8	11.5	11.5		16.1	23.0			
Fewer than half	28.6	24.7	30.3	31.1		27.1	27.0			
At least half	20.2	22.7	18.0	19.3		18.1	11.0			
Most	23.8	18.3	19.6	15.9		17.4	16.0			
Everyone	15.5	18.7	10.5	11.1		10.3	8.0			
Don't know	9.5	10.8	10.2	11.1		11.0	15.0	65.70	25	*** <.001
Mother fished	52.6	46.7	45.8	35.5		43.8	27.1	121.17	25	*** <.001
Father fished	82.6	82.2	69.8	73.4		66.2	51.6	79.16	25	*** <.001

Table 4-39. Differences among age cohorts in people and events influencing fishing interest.

	Baby bust	Baby boom		VWII	Depression	VWII	χ^2	d.f.	p
Influences on fishing interest	19-24 %	25-34 %	35-44 %	45-54 %	55-64 %	65+ %			
Did certain people have a positive influence on fishing interest or participation today?									
Don't remember	7.7	6.8	6.5	9.0	15.6	13.5			
No	30.2	25.3	39.6	39.5	43.5	51.0			
Yes	62.1	67.9	53.9	51.5	40.9	35.4	55.66	10	*** <.001
How complete or accurate is your memory of first fishing experience(s)?									
Don't remember at all	20.1	21.3	23.9	24.4	23.6	29.7			
Have a vague memory	59.8	48.0	46.9	44.8	45.9	39.6			
Have a fairly complete/accurate memory	20.1	30.7	29.2	30.7	30.6	30.7	15.72	10	.108
Was there a single event that influenced your fishing interest or participation today?									
Don't remember	35.2	28.1	26.8	28.0	30.1	36.6			
No	38.3	34.9	37.4	45.1	40.4	37.6			
Yes	22.6	36.9	35.8	26.9	29.5	25.7	17.68	10	.061
How would you rate the degree of influence of your earliest experience(s) on fishing interest today?									
Definitely influenced interest	41.7	47.8	45.4	54.3	51.6	54.5			
Somewhat influenced interest	38.7	35.1	30.9	25.8	26.5	16.8			
Had little impact on interest	16.0	14.3	20.2	16.1	18.1	17.8			
Don't remember	3.7	2.8	3.5	3.7	3.9	10.9	36.07	15	** .002

Table 4-40. Differences in age cohorts in activities done as a youth.

	Baby bust	Baby boom	WWII - Depression	WWII	χ^2	d.f.	p
Activities done as a youth	19-24 %	25-44 %	45-64 %	65+ %			
Attended fishing clinic, derby	24.8	16.1	9.0	4.5	32.89	3	*** <.001
Fished at trout farm or other facility	24.8	21.8	12.4	6.9	27.06	3	*** <.001
Fished while on school-related experience	20.0	12.5	7.4	5.7	22.18	3	*** <.001
Did water-related activities (boating, swimming)	94.0	92.3	82.5	69.6	57.51	3	*** <.001
Fished at summer youth camp	25.0	21.0	17.0	13.3	7.78	3	* .050
Fished with local youth organization	19.9	18.5	16.0	10.2	4.98	3	.173
Camped with family	82.2	73.3	54.3	44.2	80.70	3	*** <.001
Fished while camping with family	77.6	66.8	48.5	40.4	82.32	6	*** <.001

Table 4-41. Differences in age cohorts of females in activities done as a youth.

	Baby bust	Baby boom	WWII - Depression	χ^2	d.f.	p
Activities done as a youth	19-24 %	25-44 %	45-64 %			
Attended fishing clinic, derby	3.6	10.5	3.3	3.78	2	.151
Fished at trout farm or other facility	7.1	21.0	11.5	4.71	2	.095
Fished while on school-related experience	7.1	8.1	1.6	3.08	2	.214
Did water-related activities (boating, swimming)	100.0	95.1	71.4	27.79	2	*** <.001
Fished at summer youth camp	10.7	13.7	8.3	1.16	2	.560
Fished with local youth organization	7.1	8.1	11.3	0.65	2	.722
Camped with family	82.8	75.6	48.4	17.29	2	*** <.001
Fished while camping with family	72.4	66.1	38.7	17.82	4	*** <.001

Table 4-42. Differences among age cohorts in childhood fishing involvement.

	Baby bust	Baby boom		WWII	Depression	WWI	χ^2	d.f.	p
Childhood fishing involvement variable	19-24 %	25-34 %	35-44 %	45-54 %	55-64 %	65+ %			
Childhood fishing activity:									
Did not fish	6.1	3.1	7.7	11.2	12.9	22.0			
Tried fishing once or twice	4.9	5.5	8.0	5.8	5.8	5.5			
Fished occasionally	37.8	41.8	40.6	38.4	32.9	30.8			
Fished often	21.3	25.8	21.8	18.6	16.1	15.4			
Fished frequently	17.1	10.9	11.7	12.0	13.5	5.5			
Fished very frequently	9.8	9.0	5.3	7.4	9.0	2.2			
Don't remember	3.0	3.9	5.0	6.6	9.7	18.7	93.04	30	*** <.001
Childhood fishing importance:									
My most important activity	7.8	6.3	6.5	6.6	7.5	2.0			
More important than most activities	16.3	17.8	15.1	19.3	24.5	18.2			
Important	25.3	24.5	26.1	23.2	21.4	24.2			
Somewhat important	21.7	22.1	15.3	15.1	8.8	13.1			
Slightly important	12.7	19.8	17.7	16.6	17.0	14.1			
Not at all important	16.3	9.5	19.4	19.3	20.8	28.3	47.11	25	** .005
Watched fishing/outdoor shows on tv	33.6	33.0	27.0	25.0	7.9	2.7	156.08	25	*** <.001

Table 4-43. Differences among age cohorts in teen fishing involvement.

	Baby bust	Baby boom		WWII	Depression	WWI	χ^2	d.f.	p
Teen fishing involvement variable	19-24 %	25- 34 %	35- 44 %	45-54 %	55-64 %	65+ %			
Teen fishing activity:									
Did not fish	0.6	0.8	5.3	3.8	5.8	10.0			
Tried fishing once or twice	0.6	1.6	5.6	3.4	5.1	6.0			
Fished occasionally	29.9	32.4	30.1	27.0	26.3	33.0			
Fished often	19.2	20.7	23.7	28.1	19.9	25.0			
Fished frequently	27.5	25.0	19.1	19.4	23.7	16.0			
Fished very frequently	22.2	18.8	15.2	17.5	16.7	9.0			
Don't remember	0	0.8	1.1	0.8	2.6	1.0	65.90	30	*** <.001
Teen fishing importance:									
My most important activity	4.2	5.1	3.2	4.2	8.2	3.0			
More important than most activities	24.1	20.9	14.3	20.1	23.3	18.0			
Important	33.1	30.3	28.1	28.0	26.4	27.0			
Somewhat important	17.5	21.7	18.3	19.7	12.6	20.0			
Slightly important	13.9	14.2	19.9	15.9	13.2	17.0			
Not at all important	7.2	7.9	16.2	12.1	16.4	15.0	42.05	25	* .018
Watched fishing/outdoor shows on tv	54.2	42.5	32.5	34.1	18.2	9.0	161.15	25	*** <.001

Table 4-44. Proportion of each age cohort in each angler involvement type.

Angler Involvement Type	Baby bust	Baby boom		WWII	Depression	WWI	χ^2	d.f.	p
		25-34 %	35-44 %						
Low	19-24 %	25-34 %	35-44 %	45-54 %	55-64 %	65+ %			
Latent	34.4	33.9	41.5	34.4	28.3	25.0			
Spurious	9.6	15.1	13.7	18.8	19.7	20.7			
High	17.8	9.6	12.0	8.8	11.8	10.9			
	38.2	41.4	32.8	38.0	40.1	43.5	30.37	15	* .011

II. Relationships Between Socialization Processes and Development of Fishing Involvement

Ila. Relationships of Exposure Agents to Fishing Involvement

A number of exposure agent variables are significantly related to childhood, teen and adult fishing involvement as hypothesized. In all comparisons, anglers with particular familial fishing exposure agents during youth had greater childhood and teen fishing activity levels and importance. Participation by immediate family members in fishing, high proportions of extended family members who fish, and high levels of fishing participation by father and by mother were all significantly related to childhood fishing activity level (Table 4-45), teen fishing activity level (Table 4-46), childhood fishing importance (Table 4-47), and teen fishing importance (Table 4-48). Current involvement in angling was significantly related to family fishing exposure agents. Significantly more high involvement anglers than low or moderate involvement anglers while growing up had immediate family members who fished, had fathers who fished, and had high proportions of extended family members who fished (Table 4-49). Angler involvement types did not differ in the proportion who had mothers who fished (Table 4-49).

Mean current importance of fishing was significantly related to the proportion of extended family members who fished while the individual was growing up, and to the father's fishing activity level (Appendix VII, Table B-1). All familial exposure agent variables were significantly related to current fishing activity level (Appendix VII, Table B-2). Those anglers who had immediate family members who fished, who had high proportions of extended family members who fished, and who had mothers and fathers who were active anglers reported fishing the greatest mean days in 1991-92 (Appendix VII, Table B-2).

Table 4-45. Mean childhood fishing activity level by presence of exposure agents.

Exposure Agent Variables	N	Mean childhood fishing activity level (c)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npar statistic	p
Did anyone in immediate family fish?									
No	193	1.31	.09	1.13 - 1.49					
Yes	1017	2.67	.04	2.60 - 2.75	212.81	*** <.001	.212	(a) -12.91	*** <.001
Proportion of extended family who fished									
No one	102	1.39	.15	1.10 - 1.68					
Fewer than half	348	2.16	.06	2.03 - 2.28					
At least half	236	2.65	.07	2.51 - 2.79					
Most	235	2.94	.07	2.80 - 3.08					
Everyone	162	3.19	.09	3.01 - 3.36	53.33	*** <.001	*** <.001	(b) 173.28	*** <.001
Level of Mother's Fishing Activity									
Did not fish	569	2.07	.06	1.98 - 2.18					
Occasionally fished	342	2.66	.06	2.55 - 2.77					
Regularly fished	162	3.12	.09	2.94 - 3.31	56.21	*** <.001	*** <.001	(b) 106.53	*** <.001
Level of Father's Fishing Activity									
Did not fish	237	1.41	.08	1.25 - 1.57					
Occasionally fished	314	2.29	.06	2.16 - 2.41					
Regularly fished	576	2.98	.04	2.89 - 3.06	167.58	*** <.001	** .001	(b) 265.88	*** <.001

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test)

(c) Mean activity level where 0=did not fish, 1=tried fishing once or twice, 2=fished occasionally, 3=fished often, 4=fished frequently, 5=fished very frequently.

Table 4-46. Mean teen fishing activity level by presence of exposure agents.

Exposure Agent Variables	N	Mean teen fishing activity level (c)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npair statistic	p
Did anyone in immediate family fish?									
No	230	2.15	.10	1.96 - 2.34				(a)	
Yes	1063	3.25	.04	3.18 - 3.32	150.13	*** < .001	*** < .001	-10.35	*** < .001
Proportion of extended family who fished									
No one	122	2.07	.14	1.80 - 2.35					
Fewer than half	377	2.76	.06	2.64 - 2.89					
At least half	248	3.29	.07	3.15 - 3.43				(b)	
Most	244	3.48	.07	3.34 - 3.61				159.60	*** < .001
Everyone	167	3.84	.08	3.68 - 4.01	52.97	*** < .001	*** < .001		
Level of Mother's Fishing Activity									
Did not fish	624	2.75	.06	2.64 - 2.86					
Occasionally fished	358	3.23	.06	3.11 - 3.35				(b)	
Regularly fished	164	3.65	.09	3.47 - 3.83	39.00	*** < .001	*** < .001	67.39	*** < .001
Level of Father's Fishing Activity									
Did not fish	275	2.23	.09	2.05 - 2.40					
Occasionally fished	329	2.87	.06	2.74 - 2.99				(b)	
Regularly fished	601	3.53	.04	3.44 - 3.62	115.87	*** < .001	*** < .001	178.63	*** < .001

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test)

(c) Mean activity level where 0=did not fish, 1=tried fishing once or twice, 2=fished occasionally, 3=fished often, 4=fished frequently, 5=fished very frequently.

Table 4-47. Mean importance of fishing in childhood by presence of exposure agents.

Exposure Agent Variables	N	Mean importance of fishing in childhood (c)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npar statistic	p
Did anyone in immediate family fish?									
No	232	2.27	.09	2.08 - 2.45				(a)	
Yes	1065	3.50	.04	3.41 - 3.59	135.84	*** <.001	.615	-10.96	*** <.001
Proportion of extended family who fished									
No one	126	2.25	.14	1.98 - 2.52					
Fewer than half	375	2.97	.08	2.82 - 3.12					
At least half	248	3.50	.09	3.32 - 3.67					
Most	245	3.80	.08	3.63 - 3.96				(b)	
Everyone	166	4.11	.10	3.91 - 4.32	44.71	*** <.001	.094	152.29	*** <.001
Level of Mother's Fishing Activity									
Did not fish	625	2.87	.06	2.75 - 2.99					
Occasionally fished	357	3.56	.07	3.42 - 3.70				(b)	
Regularly fished	166	3.85	.11	3.64 - 4.06	42.47	*** <.001	**	78.13	*** <.001
Level of Father's Fishing Activity									
Did not fish	277	2.35	.09	2.18 - 2.53					
Occasionally fished	329	3.10	.08	2.94 - 3.26				(b)	
Regularly fished	602	3.79	.06	3.68 - 3.90	99.99	*** <.001	.383	169.17	*** <.001

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test)

(c) Mean importance where 1=not at all important, 6=most important recreational activity.

Table 4-48. Mean importance of fishing in teen years by presence of exposure agents.

Exposure Agent Variables	N	Mean importance of fishing in teens (c)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npar statistic	p
Did anyone in immediate family fish?									
No	239	2.74	.10	2.54 - 2.93					
Yes	1070	3.55	.04	3.47 - 3.63	68.88	*** <.001	*** <.001	(a) -7.66	*** <.001
Proportion of extended family who fished									
No one	129	2.63	.15	2.33 - 2.92					
Fewer than half	380	3.15	.07	3.01 - 3.29					
At least half	252	3.64	.08	3.48 - 3.79					
Most	246	3.74	.08	3.59 - 3.90					
Everyone	167	3.98	.09	3.81 - 4.16	27.99	*** <.001	*** <.001	(b) 95.75	*** <.001
Level of Mother's Fishing Activity									
Did not fish	634	3.16	.06	3.05 - 3.28					
Occasionally fished	358	3.57	.07	3.44 - 3.70					
Regularly fished	166	3.75	.10	3.55 - 3.95	17.21	*** <.001	** .002	(b) 31.42	*** <.001
Level of Father's Fishing Activity									
Did not fish	284	2.80	.09	2.62 - 2.98					
Occasionally fished	329	3.24	.08	3.09 - 3.39					
Regularly fished	604	3.76	.05	3.66 - 3.86	52.09	*** <.001	*** <.001	(b) 80.11	*** <.001

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test) (c) Mean importance where 1=not at all important, 6=most important recreational activity.

Table 4-49. Proportions of low, moderate, and high involvement anglers who had familial exposure agents for fishing.

	% of Angler Involvement Type...						
Exposure Agent Variables	Low	Latent	Spurious	High	χ^2	d.f.	p
Did anyone in immediate family fish?							
No	23.7	17.9	16.0	14.6	13.35	3	** .004
Yes	76.3	82.1	84.0	85.4			
Mother's fishing frequency					19.71	15	.183
Did not fish							
Fished occasionally	59.7	54.0	51.5	48.2			
Fished regularly	26.1	29.3	26.2	33.9			
Not present	12.0	13.2	19.2	15.3			
Don't know	1.7	2.3	1.5	1.9			
Father's fishing frequency					25.62	15	* .042
Did not fish	0.5	1.1	1.5	0.3			
Fished occasionally	27.0	23.4	20.6	18.3			
Fished regularly	29.3	21.8	24.8	24.4			
Not present	40.7	51.6	48.9	53.1			
Don't know	2.6	2.1	4.3	3.4			
	0.5	1.1	1.4	0.7			
Proportion of extended family who fished					70.68	15	*** <.001
No one	11.7	8.9	13.1	7.9			
Fewer than half	36.2	30.7	24.1	21.2			
At least half	17.4	19.8	18.6	21.2			
Most	17.0	18.8	17.9	20.4			
Everyone	6.2	11.5	10.3	20.6			
Don't remember	11.5	10.4	15.9	8.6			

IIb. Relationships of Nature of Fishing Exposure to Fishing Involvement

Current fishing involvement level was significantly related to particular fishing experiences. Significantly more high involvement anglers than low or moderate involvement anglers had attended a fishing clinic, derby or other event, fished while on a school-related experience, fished at summer camp, fished with a local youth club, went camping with their families and went fishing while camping with family while they were youth (Table 4-50). During their earliest fishing experiences, more high involvement anglers than low involvement anglers helped plan the fishing outing, cast their own lures, had to follow rules, caught big fish, handled the fish caught, caught lots of fish, ate fish, and handled their own lures or bait (Table 4-51). Spurious anglers more frequently than all other anglers reported they had been bothered by insects or bad weather and or experienced problems with equipment during their earliest experiences (Table 4-51).

Fishing socialization variables concerning the nature of early fishing exposures were related also to specific childhood, teen and adult fishing involvement variables. Mean current importance of fishing was significantly greater for those individuals who, during their earliest fishing experiences, had helped plan the fishing trip, caught lots of fish, caught big fish, cleaned fish, handled fish, cast their own lures or bait, handled their own lures or bait, ate the fish caught, and had to follow rules than for individuals who had not done those activities (Appendix VII Table B-3). Mean current importance of fishing was significantly lower for those individuals who were afraid of fish or water than for those who were not afraid during their earliest fishing experiences (Appendix VII, Table B-3). Mean current importance of fishing was unrelated to having caught no fish, landing their own fish, having problems with fishing equipment, being bothered by insects or bad weather, seeing fish die, or enjoying the outdoors, wildlife or the water while on the earliest fishing experiences (Appendix VII, Table B-4).

Mean current fishing activity level (number of days per year fishing) was significantly greater for those individuals who had helped plan their earliest fishing trips, caught lots of

fish, caught big fish, handled fish, cast their own lures or bait, ate fish caught, or had to follow rules than for those who had not done such activities (Appendix VII, Table B-5). Those who were afraid of water or fish during their earliest fishing experiences reported fewer days of fishing in 1991-92 than those who were not afraid (Appendix VII, Table B-5). Mean current fishing activity level was not related to having caught no fish, cleaned fish, landed own fish, handled lures or bait, having problems with equipment, being bothered by insects or bad weather, seeing fish die, or enjoying the outdoors, wildlife or the water while on the earliest fishing trips (Appendix VII, Table B-6).

A variety of particular fishing activities done as a youth were significantly related to both childhood and teen fishing activity level. Mean fishing activity levels were significantly greater for those teens who had done these activities than for those who had not. Childhood and teen activity levels were positively related to having attended a fishing clinic or other event; fished at a trout farm or other fee fishing facility; fished while on a school-related experience; done water-related activities (such as boating, swimming); fished at a summer youth camp; fished with local youth organizations; camped with family; and fished while camping with family (Tables 4-52 to 4-54). Childhood fishing importance was significantly related to having done all of these activities except fishing at a trout farm or other fee fishing facility (Table 4-53). Teen fishing importance was significantly related to having done all activities except fishing at a trout farm and having done water-related activities (Table 4-55).

Some fishing activities done as a youth appear to have carry-over effects on current fishing involvement. Mean current fishing importance is significantly related to having done water-related activities (boating, swimming as a youth), having fished with local youth organizations, and having fished while camping with family (Appendix VII, Table B-7). All youth fishing activities except having done water-related activities were significantly related to current fishing activity level (number of days per year fishing) (Appendix VII, Table B-8).

Table 4-50. Proportions of low, moderate, and high involvement anglers who did various fishing-related activities during youth.

Activities done as a youth	% of Angler Involvement Type...				χ^2	d.f.	p
	Low	Latent	Spurious	High			
Attended fishing clinic, derby or other event	8.9	12.2	16.0	18.8	19.15	3	*** <.001
Fished at trout farm or other fee fishing facility	16.7	13.7	17.9	22.0	7.47	3	.058
Fished while on school-related experience	10.0	10.4	6.9	15.2	10.27	3	* .016
Did water-related activities (boating, swimming)	89.4	83.9	87.0	89.8	5.32	3	.150
Fished at summer youth camp	14.8	19.0	20.1	23.5	10.65	3	* .014
Fished with local youth organization (scouts, etc.)	11.6	19.9	18.1	20.6	14.17	3	** .003
Camped with family	62.8	64.9	67.6	72.3	9.80	3	* .020
Fished while camping with family	54.4	60.8	62.7	67.8	19.01	6	** .004

Table 4-51. Proportions of low, moderate, and high involvement anglers who had certain events happen during earliest fishing experiences.

Events that Happened During Earliest Fishing Experience(s)	% of Angler Involvement Type...				χ^2	d.f.	p
	Low	Latent	Spurious	High			
Planned fishing trip	27.7	36.0	38.6	43.5	25.96	6	*** <.001
Was afraid of fish or water	14.4	12.9	12.4	9.0	10.11	6	.120
Enjoyed outdoors, water wildlife	94.8	96.8	95.8	96.3	6.63	6	.356
Bothered by insects, bad weather	44.3	46.5	51.4	45.0	12.58	6	* .050
Cast own lures, bait	75.9	86.3	80.4	86.4	19.73	6	** .003
Had to follow rules (e.g., keep quiet)	52.9	62.1	61.3	62.2	13.20	6	* .040
Caught big fish	58.0	65.9	69.7	76.9	37.32	6	*** <.001
Handled fish	76.3	84.4	81.2	85.9	22.13	6	*** <.001
Caught lots of fish	62.4	74.6	74.8	80.0	37.92	6	*** <.001
Had problems with equipment	46.5	51.6	56.1	54.4	15.81	6	* .015
Ate fish caught	77.2	86.9	79.6	88.1	22.24	6	*** <.001
Caught no fish	65.8	62.9	71.6	67.1	6.67	6	.353
Handled own lures, bait	77.0	82.8	82.3	85.0	13.19	6	* .040
Saw fish die	71.2	78.5	74.6	73.3	4.70	6	.583
Landed own fish	87.3	91.2	93.6	91.5	8.79	6	.186
Cleaned fish	82.1	86.7	84.5	87.3	9.47	6	.149

Table 4-52. Mean fishing activity level in childhood by activities done as a youth.

Activities Done as a Youth	N	Mean fishing activity in childhood (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event:									
Yes	178	3.06	.09	2.89 - 3.24					
No	996	2.34	.04	2.26 - 2.42	48.94	*** <.001	.085	-7.13	*** <.001
Fished at trout farm or other fee fishing facility:									
Yes	952	2.72	.08	2.56 - 2.87					
No	140	2.38	.04	2.30 - 2.46	12.29	*** <.001	.002	-3.53	*** <.001
Fished while on school-related experience:									
Yes	140	2.88	.11	2.67 - 3.09					
No	1040	2.39	.04	2.31 - 2.46	18.20	*** <.001	.456	-4.27	*** <.001
Did water-related activities (boating, swimming):									
Yes	1070	2.53	.04	2.45 - 2.60					
No	131	1.87	.13	1.62 - 2.12	30.83	*** <.001	*** <.001	-5.25	*** <.001
Fished at summer youth camp:									
Yes	243	2.81	.07	2.66 - 2.95					
No	940	2.35	.04	2.27 - 2.44	24.18	*** <.001	.007	-4.56	*** <.001
Fished with local youth organization (scouts, etc.):									
Yes	204	2.80	.09	2.63 - 2.98					
No	975	2.37	.04	2.29 - 2.45	19.20	*** <.001	.733	-4.10	*** <.001
Camped with family:									
Yes	827	2.68	.04	2.60 - 2.76					
No	378	1.98	.07	1.83 - 2.12	82.26	*** <.001	*** <.001	-8.81	*** <.001
Fished while camping with family:									
Yes	734	2.74	.04	2.66 - 2.82					
No	55	1.62	.18	1.25 - 1.98	51.62	*** <.001	*** <.001	-6.06	*** <.001

(a) z statistic (Mann-Whitney U test)

(c) Mean activity level where 0=did not fish, 1=tried fishing once or twice, 2=fished occasionally, 3=fished often, 4=fished frequently, 5=fished very frequently.

Table 4-53. Mean importance of fishing in childhood by activities done as a youth.

Activities Done as a Youth	N	Mean importance of fishing in childhood (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event:	180	3.98	.10	3.79 - 4.17	49.16	*** <.001	*** <.001	-6.90	*** <.001
Yes	1077	3.13	.05	3.04 - 3.22					
Fished at trout farm or other fee fishing facility:	238	3.37	.09	3.20 - 3.55	1.89	.169	*** <.001	-1.37	.170
Yes	1023	3.22	.05	3.13 - 3.32					
No									
Fished while on school-related experience:	145	3.81	.12	3.57 - 4.04	21.83	*** <.001	.127	-4.61	*** <.001
Yes	1120	3.18	.05	3.09 - 3.27					
No									
Did water-related activities (boating, swimming):	1134	3.31	.04	3.23 - 3.40	9.13	** .003	*** <.001	-2.95	** .003
Yes	151	2.91	.14	2.64 - 3.19					
No									
Fished at summer youth camp:	251	3.66	.09	3.49 - 3.84	22.17	*** <.001	* .035	-4.61	*** <.001
Yes	1015	3.16	.05	3.07 - 3.25					
No									
Fished with local youth organization (scouts, etc.):	213	3.58	.10	3.38 - 3.78	11.20	*** <.001	.265	-3.36	*** <.001
Yes	1049	3.20	.05	3.10 - 3.29					
No									
Camped with family:	862	3.52	.05	3.43 - 3.62	76.44	*** <.001	.222	-8.38	*** <.001
Yes	428	2.75	.07	2.61 - 2.90					
No									
Fished while camping with family:	761	3.61	.05	3.51 - 3.71	33.09	*** <.001	*** <.001	-5.29	*** <.001
Yes	62	2.52	.21	2.09 - 2.94					
No									

(a) z statistic (Mann-Whitney U test)

(c) Mean importance where 1=not at all important, 6=most important recreational activity.

Table 4-54. Mean fishing activity level in teens by activities done as a youth.

Activities Done as a Youth	N	Mean fishing activity in teens (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event:									
Yes	181	3.78	.08	3.62 - 3.94					
No	1073	2.94	.04	2.86 - 3.01	67.81	*** <.001	*** <.001	-8.07	*** <.001
Fished at trout farm or other fee fishing facility:									
Yes	235	3.31	.08	3.16 - 3.46					
No	1023	2.99	.04	2.91 - 3.08	10.93	*** <.001	** .002	-3.09	** .002
Fished while on school-related experience:									
Yes	148	3.45	.10	3.24 - 3.65					
No	1114	3.00	.04	2.92 - 3.08	15.44	*** <.001	.214	-3.87	*** <.001
Did water-related activities (boating, swimming):									
Yes	1128	3.12	.04	3.05 - 3.20					
No	153	2.59	.12	2.36 - 2.83	22.44	*** <.001	*** <.001	-4.16	*** <.001
Fished at summer youth camp:									
Yes	252	3.43	.08	3.28 - 3.58					
No	1010	2.97	.04	2.89 - 3.05	25.48	*** <.001	* .046	-4.73	*** <.001
Fished with local youth organization (scouts, etc.):									
Yes	216	3.37	.08	3.20 - 3.53					
No	1042	2.99	.04	2.91 - 3.07	14.77	*** <.001	* .048	-3.51	*** <.001
Camped with family:									
Yes	862	3.26	.04	3.18 - 3.35					
No	425	2.66	.07	2.53 - 2.79	63.62	*** <.001	*** <.001	-7.46	*** <.001
Fished while camping with family:									
Yes	764	3.32	.04	3.24 - 3.40					
No	59	2.07	.19	1.69 - 2.45	62.13	*** <.001	*** <.001	-6.40	*** <.001

(a) z statistic (Mann-Whitney U test)

(c) Mean activity level where 0=did not fish, 1=tried fishing once or twice, 2=fished occasionally, 3=fished often, 4=fished frequently, 5=fished very frequently.

Table 4-55. Mean importance of fishing in teens by activities done as a youth.

Activities Done as a Youth	N	Mean importance of fishing in teens (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event:	183	3.96	.08	3.79 - 4.12	36.96	*** <.001	*** <.001	-6.05	*** <.001
Yes	1089	3.29	.04	3.20 - 3.37					
No									
Fished at trout farm or other fee fishing facility:	239	3.44	.08	3.28 - 3.61	.61	.437	.043	-.66	.509
Yes	1037	3.37	.04	3.28 - 3.45					
No									
Fished while on school-related experience:	147	3.76	.11	3.54 - 3.97	11.97	*** <.001	.032	-3.42	*** <.001
Yes	1133	3.33	.04	3.25 - 3.41					
No									
Did water-related activities (boating, swimming):	1147	3.41	.04	3.34 - 3.49	3.50	.061	*** <.001	-1.54	.124
Yes	153	3.19	.13	3.93 - 3.45					
No									
Fished at summer youth camp:	254	3.68	.08	3.52 - 3.84	14.42	*** <.001	.046	-3.58	*** <.001
Yes	1027	3.31	.04	3.22 - 3.40					
No									
Fished with local youth organization (scouts, etc.):	216	3.68	.08	3.50 - 3.86	11.67	*** <.001	.168	-3.29	*** <.001
Yes	1061	3.33	.04	3.25 - 3.41					
No									
Camped with family:	870	3.55	.04	3.46 - 3.64	33.88	*** <.001	.003	-5.56	*** <.001
Yes	434	3.08	.07	2.94 - 3.22					
No									
Fished while camping with family:	768	3.62	.05	3.53 - 3.71	25.99	*** <.001	*** <.001	-4.60	*** <.001
Yes	62	2.73	.21	2.31 - 3.14					
No									

(a) z statistic (Mann-Whitney U test)

(c) Mean importance where 1=not at all important, 6=most important recreational activity.

Socialization Experiences Related to Early Fishing Satisfaction

Anglers who participated in certain types of early fishing socialization activities report greater mean satisfaction with their early fishing experiences than those who did not take part in such activities (Table 4-56). Mean satisfaction with early fishing experiences was greatest for those individuals who had attended a fishing clinic or other event, fished while on school-related experiences, fished at a summer youth camp, camped with family, and fished while camping with family (vs. those who had not done these activities) (Table 4-56).

Relationships of Early Fishing Satisfaction with Current Fishing Involvement

Current angling involvement was related to individuals' satisfaction with their earliest fishing experiences. A significantly higher proportion of latent and high involvement anglers than spurious or low involvement anglers reported they were satisfied with their earliest fishing experiences (Table 4-57). Anglers satisfied with early fishing experiences reported significantly greater current importance of fishing, but early fishing satisfaction was not significantly related to current total annual days fishing (Table 4-58).

Angler Involvement Types and Their Earliest Fishing Experiences

Angler involvement groups differed in their recollection of their earliest fishing experiences. Lower proportions of low involvement anglers reported they had a complete and accurate memory of their earliest fishing experiences; more high involvement anglers than any other type reported that a specific event influenced their fishing interest or participation today and that their earliest fishing experiences definitely influenced their level of interest in fishing today (Table 4-59).

More high involvement anglers than other groups reported fishing on rivers, ice fishing, fishing while wading, or trolling during their earliest experiences (Table 4-60). More low involvement anglers than other anglers fished from inland lakes, streams or ponds, from shore or from a boat, or used casting methods during early fishing outings (Table 4-60).

Table 4-56. Mean satisfaction with early fishing experiences by exposure to certain activities as a youth.

Activities Done as a Youth	N	Mean satisfaction with early fishing (c)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event:	170 1004	1.40 1.66	.06 .02	1.28 - 1.52 1.60 - 1.71	13.94	*** <.001	.532	-4.85	*** <.001
Fished at trout farm or other fee fishing facility:	222 956	1.60 1.62	.06 .03	1.49 - 1.72 1.57 - 1.67	.08	.775	.436	-.55	.583
Fished while on school-related experience:	137 1044	1.48 1.64	.07 .03	1.35 - 1.62 1.59 - 1.69	4.28	* .039	.188	-2.45	* .014
Did water-related activities (boating, swimming):	1058 142	1.61 1.70	.03 .07	1.56 - 1.66 1.56 - 1.83	1.31	.252	.210	-1.76	.078
Fished at summer youth camp:	233 949	1.51 1.64	.05 .03	1.41 - 1.61 1.59 - 1.69	4.51	* .034	* .031	-2.25	* .025
Fished with local youth organization (scouts, etc.):	202 977	1.58 1.63	.06 .03	1.47 - 1.69 1.57 - 1.68	.52	.473	.535	-.86	.392
Camped with family:	815 393	1.59 1.71	.03 .04	1.53 - 1.64 1.62 - 1.79	5.50	* .019	.927	-3.03	** .002
Fished while camping with family:	721 54	1.54 2.00	.03 .14	1.48 - 1.60 1.71 - 2.29	15.77	*** <.001	*** <.001	-3.74	** .002

(a) z statistic (Mann-Whitney U test)

(c) Where 1=satisfied, 5=not satisfied.

Table 4-57. Proportions of low, moderate, and high involvement anglers who were satisfied, neutral or dissatisfied with early fishing experiences.

Level of satisfaction with early fishing experiences	% of Angler Involvement Type...				χ^2	d.f.	p
	Low	Latent	Spurious	High			
Satisfied	78.6	86.5	77.9	86.6	23.77	9	** .005
Neutral	10.5	6.3	11.0	5.4			
Dissatisfied	3.5	4.7	2.1	1.7			
Don't remember	7.5	2.6	9.0	6.3			

Table 4-58. Relationship of early fishing satisfaction with current importance of fishing and total days spent fishing per year.

Satisfaction level	N	Mean	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) χ^2	p
CURRENT IMPORTANCE OF FISHING (b)									
Satisfied	1093	4.28	.04	4.20 - 4.35					
Neutral	108	3.56	.13	3.30 - 3.81					
Dissatisfied	38	3.89	.24	3.40 - 4.39	18.28	***<.001	***<.001	30.81	***<.001
TOTAL ANNUAL DAYS SPENT FISHING									
Satisfied	1015	36.75	1.24	34.32 - 39.18					
Neutral	98	30.42	3.46	23.56 - 37.28					
Dissatisfied	35	28.97	5.56	17.66 - 40.28	1.78	.178	***<.001	4.59	.101

(a) X² (Kruskal-Wallis test)

(b) Where 1=not at all important and 6=most important recreational activity.

Table 4-59. Proportions of low, moderate and high involvement anglers and their memory of early fishing experiences.

	% of Angler Involvement Type...				χ^2	d.f.	p
	Low	Latent	Spurious	High			
Memory of earliest fishing experiences							
How complete or accurate is memory?							
I don't remember first experience(s) at all	31.2	17.0	21.9	20.7			
I have a vague memory of first experience(s)	45.9	51.0	46.6	49.4			
I have a fairly complete and accurate memory	22.9	32.0	31.5	29.9	23.09	6	*** <.001
Was there a single event which influenced your fishing interest or participation level today?							
Don't remember	30.8	26.4	33.1	29.1			
No	46.5	38.9	37.9	32.0			
Yes	22.8	34.7	29.0	38.9	32.81	6	*** <.001
What was the level of influence of your earliest experience(s) on your fishing interest today?							
My earliest experiences...							
definitely influenced my interest	32.7	57.8	44.5	62.3			
somewhat influenced my interest	35.0	28.6	30.8	25.2			
had little impact on my interest	26.4	12.0	20.5	8.7			
don't remember	5.8	1.6	4.1	3.9	102.10	9	*** <.001

Table 4-60. Proportions of low, moderate and high involvement anglers who had various types of early fishing experiences.

Type of Earliest Fishing Experience	% of Angler Involvement Type...			
	Low	Latent	Spurious	High
Fished on:				
River	19.1	23.2	21.2	28.7
Great Lakes	16.4	16.4	19.9	20.6
Inland lake	39.2	50.3	50.0	47.3
Stream	9.8	16.4	12.3	15.7
Pond	7.1	9.2	12.3	12.5
Fished from:				
Dock or pier	25.1	27.0	24.0	28.9
Charter boat	1.8	1.0	1.4	2.1
On ice	8.9	10.7	11.0	19.1
Shore	33.3	48.5	38.4	46.5
Boat	36.6	43.4	51.4	42.0
Wading	4.3	7.7	6.2	12.1
Method used:				
Spincasting	7.3	8.7	10.3	14.3
Trolling	9.1	13.8	13.0	16.2
Casting	22.4	30.6	32.9	28.4
Bait fishing	52.5	62.2	54.1	61.1
	5.9	10.7	8.9	11.1

III. Relationships Among Fishing Involvement Variables

As hypothesized, childhood and teen involvement in fishing is significantly related to current fishing involvement. High involvement anglers (those who fished more than the median number of 24 days per year and who had a total commitment score above the median) reported the greatest level of childhood fishing activity (Table 4-61). Over 26% of high involvement anglers reported they fished frequently or very frequently in childhood, and over 58% reported they fished frequently or very frequently in teen years (Table 4-62). Significantly more high involvement anglers than any other involvement group reported that their fishing activity increased in teen years; over 57% reported that teen fishing activity increased (Table 4-62). High involvement anglers more frequently reported that fishing was an important recreation activity in childhood and teen years (Table 4-61 and 4-62).

In particular, level of fishing activity in childhood and teen years and importance of fishing during childhood and teens were all significantly related to anglers' current rating of importance of fishing (Appendix VII, Tables C-1 and C-2). Likewise, level of fishing activity and importance of fishing in both childhood and teens were also significantly related to anglers' current fishing activity level (days fishing per year) (Appendix VII, Tables C-3 and C-4). In fact, anglers who fished very frequently in childhood fished more than twice as much per year in 1991-92 than those who did not fish in childhood (means of 51 days for frequent childhood anglers vs. 23 days per year for childhood nonanglers) (Appendix VII, Table C-3). Anglers who fished very frequently in their teens reported mean current fishing participation of 62 days per year, whereas those who did not fish as teens fished an average of only 18 days per year (Appendix VII, Table C-4). In summary, level of fishing exposure and activity throughout childhood and teen years is highly related to current fishing attitudes (importance) and behavior (frequency of participation).

Analysis of variance results provide insight into the degree of influence of several variables on fishing involvement. Current fishing involvement is related to the individual's level of fishing exposure (activity level and importance level) during childhood and teen years

(Table 4-63). When the main effects of these variables are considered in an analysis of variance, the main effects of childhood activity level on fishing involvement are not significant ($p=.600$); all other variables (childhood and teen fishing importance and teen fishing activity) are significant ($p<.05$) (Table 4-63). Together, these variables account for approximately 24% of the variance in current fishing involvement (multiple r -squared=.242). When the variable sex is added to the analysis of variance model, multiple r -squared increases to .262 (Table 4-64).

Considering timing of childhood exposure to fishing (age of first fishing), level of childhood and teen fishing activity, and family fishing involvement together in an analysis of variance model with fishing involvement as the dependent variable is shown in Table 4-65. Again, the main effects of childhood activity level on fishing involvement were not significant ($p=.519$), but all other variables' main effects were significant ($p<.05$) in influencing current fishing involvement (Table 4-65). Again, multiple r -squared for this model (.168) was less than that for this model with sex as an added independent variable (multiple r -squared = .198) (Table 4-66). The results of both analysis of variance models indicate that a) childhood fishing activity level may have an indirect relationship with current fishing involvement; and b) there exist other variables which may have effects on fishing involvement. These additional variables will be considered in a path model of variables influencing current fishing involvement.

Table 4-61. Proportions of angler involvement types who had various levels of childhood fishing involvement.

Childhood Fishing Involvement Variables	% of Angler Involvement Type...			χ^2	d.f.	p
	Low	Latent	Spurious			
Level of fishing activity in childhood						
Did not fish	11.0	9.0	9.0			
Tried fishing	9.2	4.2	4.1			
Fished occasionally	42.5	40.2	42.8			
Fished often	17.7	21.7	17.2			
Fished frequently	8.5	12.2	12.4			
Fished very frequently	3.9	7.9	4.8			
Don't remember	7.1	4.8	9.7	66.58	18	*** < .001
Importance of fishing in childhood						
Not at all important	27.0	12.2	18.4			
Slightly important	20.0	12.2	17.0			
Somewhat important	21.2	14.8	23.8			
Important	19.3	31.2	22.4			
More important than most activities	10.9	24.3	13.6			
Most important activity	1.6	5.3	4.8	144.53	15	*** < .001

Table 4-62. Proportions of angler involvement types who had various levels of teen fishing involvement.

Teen Fishing Involvement Variables	% of Angler Involvement Type...				χ^2	d.f.	p
	Low	Latent	Spurious	High			
Level of fishing activity in teens							
Did not fish	6.4	4.2	2.1	1.5			
Tried fishing	6.7	2.6	3.4	1.5			
Fished occasionally	44.3	26.7	32.9	15.4			
Fished often	22.5	28.3	26.7	21.4			
Fished frequently	13.5	23.6	18.5	30.1			
Fished very frequently	5.3	14.7	15.8	28.8			
Don't remember	1.4	0.0	0.7	1.3	209.52	18	*** <.001
Did fishing activity level change in teens?							
Higher activity in teens	34.8	48.1	52.7	57.7			
Lower activity in teens	28.8	22.2	16.2	13.9			
About the same (no change)	36.4	29.6	31.1	28.3	56.77	6	*** <.001
Importance of fishing in teens							
Not at all important	21.6	10.0	10.9	5.4			
Slightly important	25.7	8.4	17.0	7.7			
Somewhat important	23.0	21.1	23.1	13.5			
Important	24.1	28.9	34.0	33.0			
More important than most activities	4.8	30.0	12.2	30.4			
Most important activity	0.7	1.6	2.7	10.1	268.48	15	*** <.001

Table 4-63. Analysis of variance – effects of childhood and teen fishing activity (CHILDACT AND TEENACT) and importance of fishing in childhood and teen years (IMPCCHILD AND IMPTEEN) on INVOLVE (current fishing involvement). Multiple R-squared = .241).

Source of Variation	Sum of Squares	d.f.	Mean square	F	Sig. of F	Eta squared	Beta
Main effects	195.885	20	9.794	17.449	< .001	.52	
CHILDACT	2.61	5	.522	.931	.460	.05	.07
TEENACT	20.681	5	4.132	7.362	< .001	.17	.23
IMPCCHILD	6.225	5	1.245	2.218	.050	.10	.09
IMPTEEN	34.179	5	6.836	12.179	< .001	.20	.32
Explained	195.885	20	9.794	17.449	< .001		
Residual	618.544	1102	.561				
Total	814.429	1122	.726				

Table 4-64. Analysis of variance – effects of sex of individual, childhood and teen fishing activity (CHILDACT AND TEENACT) and importance of fishing in childhood and teen years (IMPCCHILD AND IMPTEEN) on INVOLVE (current fishing involvement). (Multiple R-squared = .262).

Source of Variation	Sum of Squares	d.f.	Mean square	F	Sig. of F	Eta squared	Beta
Main effects	211.936	21	10.092	18.489	< .001	.60	
CHILDACT	1.985	5	.399	.731	.600	.05	.06
TEENACT	20.113	5	4.023	7.369	< .001	.18	.23
IMPCCHILD	6.236	5	1.247	2.285	.044	.11	.09
IMPTEEN	28.945	5	5.789	10.605	< .001	.20	.29
SEX	13.459	1	13.459	24.656	< .001	.06	.13
Explained	211.936	21	10.092	18.489	< .001		
Residual	596.629	1093	.546				
Total	808.565	1114	.726				

Table 4-85. Analysis of variance – effects of childhood and teen fishing activity (CHILDACT AND TEENACT) whether immediate family members fish or not (FAMFISH), and age of first fishing experience (AGEFIRST) on INVOLVE (current fishing involvement). (Multiple R-squared = .168).

Source of Variation	Sum of Squares	d.f.	Mean square	F	Sig. of F	Eta squared	Beta
Main effects	132.827	14	9.488	15.439	< .001	.22	
CHILDACT	2.591	5	.518	.843	.519	.05	.06
TEENACT	92.132	5	18.426	29.984	< .001	.16	.43
IFAMFISH	.038	1	.038	.062	.803	.01	.01
AGEFIRST	.980	3	.327	.532	.661	.00	.05
Explained	132.827	14	9.488	15.439	< .001		
Residual	659.400	1073	.615				
Total	792.227	1087	.729				

Table 4-86. Analysis of variance – effects of sex of individual, childhood and teen fishing activity (CHILDACT AND TEENACT) whether immediate family members fish or not (FAMFISH), and age of first fishing experience (AGEFIRST) on INVOLVE (current fishing involvement). (Multiple R-squared = .198).

Source of Variation	Sum of Squares	d.f.	Mean square	F	Sig. of F	Eta squared	Beta
Main effects	155.801	15	10.387	17.527	< .001	.28	
CHILDACT	1.536	5	.307	.518	.762	.05	.05
TEENACT	79.117	5	15.823	26.702	< .001	.17	.41
IFAMFISH	.046	1	.046	.077	.781	.01	.01
AGEFIRST	1.545	3	.515	.869	.457	.00	.07
SEX	20.624	1	20.624	34.803	< .001	.05	.17
Explained	155.801	15	10.387	17.527	< .001		
Residual	630.524	1064	.593				
Total	786.325	1079	.729				

IV. Relationships Between Constraints and Fishing Involvement

Respondents indicated that a number of intrapersonal, interpersonal and structural constraints influenced their fishing activity level during teen years. The most frequently reported constraint to fishing in teen years were changes in available time due to shifts in other recreational or social activities; 40% of teens who experienced a change in fishing activity level in teen years reported that diminished time constrained their fishing activity (Table 4-67). Other important constraints were changes in available time due to school obligations (reported by 39% of those experiencing a change in activity level), changes in available time due to work (37%), and changes in time due to family commitments (26%). Interpersonal influences (changes in fishing activity level of family or friends) more frequently increased fishing activity of teens than decreased it (Table 4-67). The most frequently reported factor increasing fishing activity of teens was gaining more freedom to do desired activities; 52% of teens who had a change in fishing activity level reported that this served to increase their fishing activity. Other important positive influences on teen fishing activity were gaining access to transportation (reported by 48%), having changes in amount or type of fishing opportunities nearby (34%), and changes in personal interests and preferences (42%). Changes in interests and preferences, however, also acted as a constraint decreasing fishing activity for 29% of teens who had a change in activity level (Table 4-67).

Current constraints to fishing activity for those who were interested in fishing more often were different than those constraints they reported for their teen years. All fishing involvement groups reported the greatest mean constraint score to be the lack of enough time due to work commitments (Table 4-68). Time constraints due to family and due to other recreational or social activities were also important for all groups, but low involvement anglers had a significantly higher mean score for these constraints than all other groups (Table 4-68). Low involvement anglers also had significantly higher mean scores for the constraints of "no good fishing near home", "I rarely catch the size or type of fish I want," "I don't have fishing equipment," "I lack others to go fishing with," "I lack information about where to go fishing,"

and "I don't have enough fishing knowledge or skills" (Table 4-68). Spurious anglers differed from other angler groups in having the highest mean constraint scores for "bad weather often interferes," and "I don't think there's enough fish of legal size" (Table 4-68). Interestingly, high involvement anglers had higher mean scores than all other groups for certain constraints; these included "fishing areas are too crowded," "costs of transportation are too great," and "I don't think there's enough fish of legal size" (Table 4-68). High involvement anglers also had a significantly higher mean score for the constraint of "concern about fish contaminants, toxics or pollution," although this was among the highest rated constraints for all groups (Table 4-68).

About 9% of respondents (n=127) were not interested in going fishing more often. Of these anglers, about one-fourth (n=32) reported that they are already a dedicated angler and fish quite often. For those anglers who were not interested in going fishing more often, the constraint with the highest mean score was that of "I'm more interested in other forms of recreation and/or social activities" (Table 4-69). Other constraints with the highest mean scores were "I'm too involved in my work," "I'm too involved in family obligations," and "I don't enjoy fishing that much."

Table 4-67. Frequency of constraints or opportunity factors for fishing in teen years reported by those anglers who experienced a change of fishing activity level in teen years.

	Percent of anglers who reported fishing activity changed in teens		
	Important in decreasing activity	Not a factor	Important in increasing fishing activity
Constraint in teen years			
<u>Structural constraints</u> Changes in amount or type of fishing opportunities nearby Changes in time available due to: work obligations school obligations family commitments other recreational or social activities I gained access to transportation	15.4 36.8 39.1 25.6 40.1 10.2	48.9 47.4 47.4 61.7 45.7 40.9	34.3 14.9 12.5 11.5 13.0 48.1
<u>Interpersonal constraints</u> Changes in fishing activity of other family members Changes in friends' fishing activity level	18.7 16.6	48.4 42.6	28.9 38.5
<u>Intrapersonal constraints</u> Changes in my interests and preferences I gained more freedom to do what I wanted	29.3 12.0	26.8 35.4	42.4 52.1

	Mean importance by Angler Involvement Type...(a)				F ratio	F prob	Homogeneity of variance	X2	p
	Low	Latent	Spurious	High					
Constraint to fishing									
Structural constraints									
Not enough time due to:									
work commitments	3.60	3.67	3.65	3.62	.11	.953	yes		
family commitments	3.07	2.90	2.84	2.69	7.17	***<.001	yes		
school commitments	1.52	1.37	1.61	1.38	2.50	.058	no	4.74	.192
other recreational or social activities	2.90	2.62	2.60	2.05	35.92	***<.001	no	97.68	***
Access:									
No access to convenient fishing sites	2.20	2.12	2.20	2.23	.30	.829	yes		
No good fishing near home	2.32	2.13	2.16	2.05	2.71	* .044	yes		
Fishing areas are too crowded	2.06	2.25	2.15	2.35	3.84	** .010	yes		
Economics:									
Cost of fishing equipment is too high	1.79	1.73	1.86	1.87	.83	.477	yes		
Cost of licenses is too high	1.97	1.86	1.98	1.89	.49	.687	yes		
Costs of transportation are too great	1.60	1.59	1.73	1.81	3.32	* .019	yes		
Management-related:									
Fishing regulations are too restrictive	1.50	1.59	1.59	1.69	2.07	.102	yes		
Regulations too complex and confusing	1.61	1.46	1.46	1.52	1.32	.264	yes		
Concern about fish contaminants, toxics	2.02	2.06	2.31	2.28	3.37	* .018	yes		
Not enough fish of legal size	2.25	1.92	2.19	1.77	10.78	***<.001	no	34.05	***
I rarely catch size/type of fish I want	2.67	2.54	2.67	2.99	5.21	***<.001	yes		
Other:									
Bad weather often interferes	2.36	2.53	2.76	2.44	3.39	* .017	yes		
I don't have fishing equipment	1.44	1.20	1.32	1.23	6.26	***<.001	no	30.03	***
Interpersonal constraints									
I don't have others to go fishing with	1.93	1.81	1.65	1.49	11.77	***<.001	no	40.14	***
Family/friends would disapprove of increased fishing	1.40	1.41	1.38	1.61	4.50	** .004	no	6.69	.082
Some family/friends believe it is wrong to catch fish for sport	1.06	1.09	1.06	1.15	2.69	* .045	no	3.07	.381

Table 4-68. (continued).

Intrapersonal constraints I'm physically unable to go fishing I don't have fishing knowledge/skills I lack information about where to go fishing	1.13	1.18	1.12	1.21	1.32	.267	no no yes	4.25 85.38	.236 ***
	1.89	1.42	1.59	1.34	24.59	***<.001			
	1.96	1.79	1.88	1.70	3.41	* .017			

(a) Where 1=Not at all important, 3=Important, 5=Extremely important.
(b) Kruskal-Wallis X².

Table 4-69. Mean importance rating for reasons for being uninterested in going fishing more often.

Constraint	Mean importance (a)
<u>Structural constraints</u>	
More interested in other forms of recreation/social activities	2.95
Too involved in work	2.28
Too involved in family obligations	2.00
Too busy with school	1.28
<u>Intrapersonal constraints</u>	
I don't enjoy fishing that much	1.81
I'm already a dedicated angler and I fish quite often	1.67
I lack information about where to go fishing	1.50
I'm physically unable to participate in fishing	1.18
Very little about fishing appeals to me	1.64
I don't have enough fishing knowledge or skills	1.67
There are certain aspects of fishing I just don't like	1.50

(a) Where 1=Not at all important, 3=Important, 5=Extremely important.

V. Relationships Between Fishing Involvement and Environmental Stewardship

On the whole, as hypothesized, anglers exhibit certain environmental stewardship behaviors more frequently than the "general" American public (Table 4-70). In comparing angler stewardship with that of the American public (data collected by the Roper Organization, Inc. 1990), significantly higher proportions of anglers than "all Americans" reported they sort trash to separate recyclables, avoid buying products from environmentally irresponsible companies, and contribute money to environmental organizations either on a regular basis or from time to time (Table 4-70).

In some instances, current fishing involvement was related to environmental stewardship behaviors of anglers. Significantly more high involvement anglers than low involvement anglers contact managing agencies or legislators, boycott environmentally irresponsible companies, contribute money to environmental organizations, write letters to politicians about environmental issues, participate in environmental clean-ups or habitat improvement projects, and take part in legal activities to protect the environment (Table 4-71). Latent anglers participated in most of these stewardship activities as frequently as high involvement anglers (Table 4-71). Interestingly, significantly fewer high involvement and spurious anglers than all other anglers reported they sort trash for recyclables (Table 4-71).

Anglers who rated fishing as an important recreational activity had significantly higher mean stewardship scores than anglers who rated fishing as unimportant for the activities of boycotting irresponsible companies and participating in habitat improvement projects (Appendix VII, Table D-3, D-9). Anglers who reported the greatest days fishing per year had significantly higher mean scores than low-frequency anglers on contacting management agencies, boycotting irresponsible companies, and taking part in habitat improvement projects (Appendix VII, Tables D-1, D-3, D-9). There were somewhat ambiguous relationships between current importance of fishing and contacting agencies, contributing money to environmental organizations and taking part in legal action; those individuals who rated fishing as "not important" and as "the most important" reported doing these activities more

than those for whom fishing was of medium importance (Appendix VII, Tables D-1, D-5, D-8). There were also ambiguous relationships between current annual fishing participation (total days) and taking part in clean-up or legal actions; those who participated much or very little in fishing reported the highest level of participation in those two types of stewardship activities (Appendix VII, Tables D-7, D-8). Finally, sorting trash to remove recyclables was inversely related to fishing participation (total days); higher proportions of less-frequent anglers than frequent anglers sort their trash on a regular basis (Appendix VII, Table D-2). There was no relationship between current importance of fishing and sorting trash to remove recyclables, decreasing car use to conserve fuels, writing letters to politicians, taking part in a clean-up project, or being a member of an environmental organization (Appendix VII, Tables D-2, D-4, D-6, D-7, D-10). There were also no relationships between total annual fishing frequency and decreasing car use, contributing money to environmental organizations, writing letters to politicians, and being a member in environmental organizations (Appendix VII, Tables D-4, D-5, D-6, D-10).

Having immediate family members who fished while growing up was significantly related to only two environmental stewardship activities: contributing money to environmental organizations and maintaining membership in environmental organizations (Table 4-72).

Table 4-70. Stewardship activities undertaken by the American public vs. Michigan angler respondents.

Stewardship Variable	Do on a regular basis (%)	Do from time to time (%)	Don't really bother about (%)	Don't know (%)	χ^2	d.f.	p
Sort trash to separate recyclables American public (a) Michigan angler respondents	24 47.9	17 26.5	58 22.8	1 2.9	26.33	3	*** <.001
Avoid buying products from environmentally irresponsible companies American public Michigan angler respondents	16 21.5	27 40.9	54 30.2	4 7.5	11.57	3	** <.01
Cut down on use of automobile American public Michigan angler respondents	8 5.0	14 21.8	76 70.6	2 2.7	2.71	3	>.05
Contribute money to environmental organizations American public Michigan angler respondents	8 10.1	19 44.9	72 39.9	1 5.1	22.63	3	*** <.001
Write letters to politicians American public Michigan angler respondents	4 2.7	14 17.1	80 74.8	2 5.4	1.55	3	>.05

(a) Data from The Roper Organization, Inc 1990.

Table 4-71. Proportions of low, moderate, and high involvement anglers who did environmental stewardship activities from time to time or on a regular basis.

	% of Angler Involvement Type...				χ^2 (9 d.f.)	p
	Low	Latent	Spurious	High		
Environmental stewardship activity done from time to time or on regular basis						
Contacting a managing agency, legislature about environmental topic	19.8	27.7	17.6	30.3	18.87	* .026
Sort trash to separate garbage from recyclables	77.9	77.1	66.0	71.4	28.27	***<.001
Avoid buying products from environmentally irresponsible companies	59.5	64.3	56.7	65.3	28.35	***<.001
Cut down on use of auto	27.7	24.6	20.4	28.2	10.47	.314
Contribute money to environmental organizations	48.9	59.2	48.6	61.9	25.69	** .002
Write letters to politicians about environmental issues	16.7	21.9	18.4	22.8	16.79	* .052
Volunteer for a "clean-up" project	23.9	36.7	26.5	36.8	34.10	***<.001
Initiate or take part in legal action to protect environment	15.9	31.8	21.1	31.6	46.59	***<.001
Volunteer on habitat improvement project	10.2	22.6	16.9	25.6	45.73	***<.001
Maintain membership in environmental organization	20.8	24.3	19.0	23.4	7.82	.552

Table 4-72. Proportions of anglers from fishing families who do certain environmental stewardship activities.

Environmental Stewardship Activity	Did anyone in immediate family fish while you were growing up?		χ^2	d.f.	p
	% of those who responded "No"	% of those who responded "Yes"			
Contribute money to environmental organizations					
Do on a regular basis	5.6	10.8			
Do from time to time	43.3	45.3			
Don't really bother about	45.6	38.8			
Don't know	5.6	5.0	8.48	3	* .037
Maintain membership in environmental organization					
Do on a regular basis	7.2	12.5			
Do from time to time	13.5	9.8			
Don't really bother about	72.9	71.3			
Don't know	6.4	6.5	7.83	3	* .049

Path Model of Familial Fishing Socialization

Based on the descriptive findings of this study, on the analysis of variance of predictors of fishing involvement, and on the underlying theoretical model of fishing socialization presented in Figure 2-4, a path model specifically describing socialization into fishing by familial sources was proposed (Figure 4-1). For the purposes of this model, two variables describing overall childhood and teen fishing involvement were created (Table 4-73). These variables, CINVOKE and TINVOKE, are similar to the involvement typology used as the dependent variable throughout this study; all of these involvement variables incorporate both the affective and behavioral dimensions of fishing involvement (Table 4-73). Codings for other variables used in the path model of familial fishing socialization are shown in Figure 4-2.

Table 4-73. Typology of childhood and teen fishing involvement for use in path model.

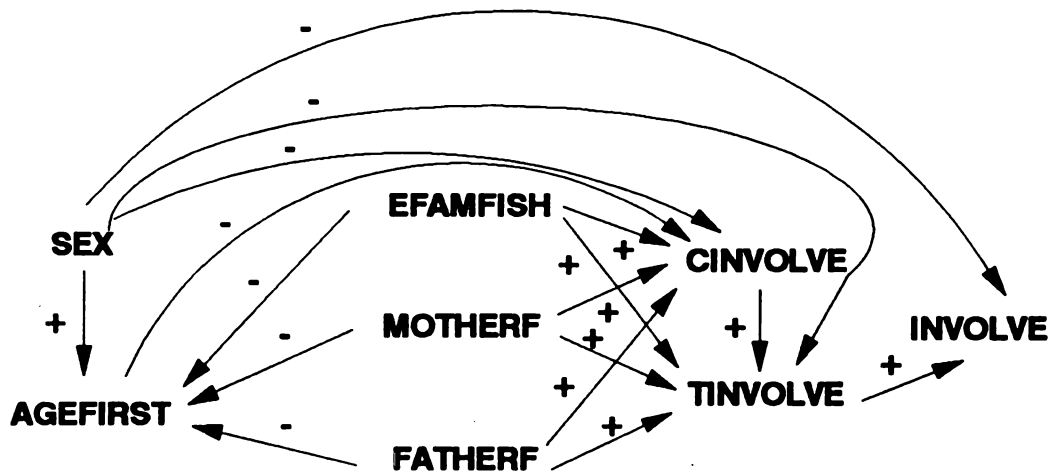
If Fishing Activity Level in Childhood and Teen Years Was...	And Interest in Fishing in Childhood and Teen Years Was...	Individuals' Fishing Involvement in Childhood (CINVOLVE) and Teen Years (TINVOLVE) was ...
Low (Did not fish, tried fishing once or twice, or fished occasionally)	Low (Not important, slightly important, or somewhat important)	Low (coded as 1)
Low	High (Important, more important than most activities, or the most important activity)	Moderate (coded as 2)
High (Fished often, frequently or very frequently)	Low	Moderate (coded as 2)
High	High	High (coded as 3)

Data from this study supported the hypothesized path model (Chi-square=4.25, 6 d.f., $n=810$). Path coefficients and correlation matrices are shown in Figure 4-2 and Table 4-74, respectively. Nearly all of the path coefficients were in the hypothesized direction and were large enough to make some contribution to predicting current fishing involvement. Path coefficients, however, relating MOTHERF (mother's fishing frequency) to AGEFIRST (age of first fishing experience), CINVOKE and TINVOLVE were nearly 0.00 (-.05 or .04). One path coefficient, between MOTHERF and TINVOLVE was negative and thus not in the hypothesized direction. When Motherf was removed from the path model, the data supported this alternative model (Chi-square=5.34, 5 d.f., $n=810$).

Further analysis revealed that SEX moderates the relationship between MOTHERF (level of mother's fishing activity) and CINVOKE or TINVOLVE (Figure 4-3). More specifically, for females, increased childhood or teen fishing involvement is contingent upon the regular fishing participation of their mothers; if mothers' fishing participation is not at least regular, there is no effect of mother's fishing participation on childhood or teen fishing involvement of females. For males any fishing activity by mothers is sufficient to produce increased childhood or teen involvement in fishing (Figure 4-3). One reason that it may take regular fishing by mothers to produce any effect in increasing females' childhood or teen involvement is that the process of social modelling may be different for females vs. males. Observing a same-sex role model participating in fishing may be important for both girls and boys. However, for girls it may take a stronger social model (i.e. a mother who regularly fishes) to overcome other sex role cues (such as those from peers) negatively influencing a girl's propensity to fish. Implications of this finding are that to increase girls' fishing involvement it is not sufficient just to get their mothers to try fishing. Instead, programs should target mothers and families to encourage their regular fishing participation while their children are growing up.

Hypothesized Path Model of Familial Fishing Socialization

ANTECEDENTS	FAMILIAL SOCIALIZATION AGENTS	OUTCOMES
-------------	----------------------------------	----------



SEX
1 = Male
2 = Female

AGEFIRST = Age of
first fishing experience

EFAMFISH =
Proportion of extended
family who fished

MOTHERF, FATHERF
= Level of mother's,
father's fishing activity

CINVOLVE, TINVOLVE
= Level of childhood
and teen involvement in
fishing

INVOLVE = Level of
current fishing
involvement

Figure 4-1. Hypothesized path model of familial fishing socialization.

Path Coefficients for Model of Familial Fishing Socialization

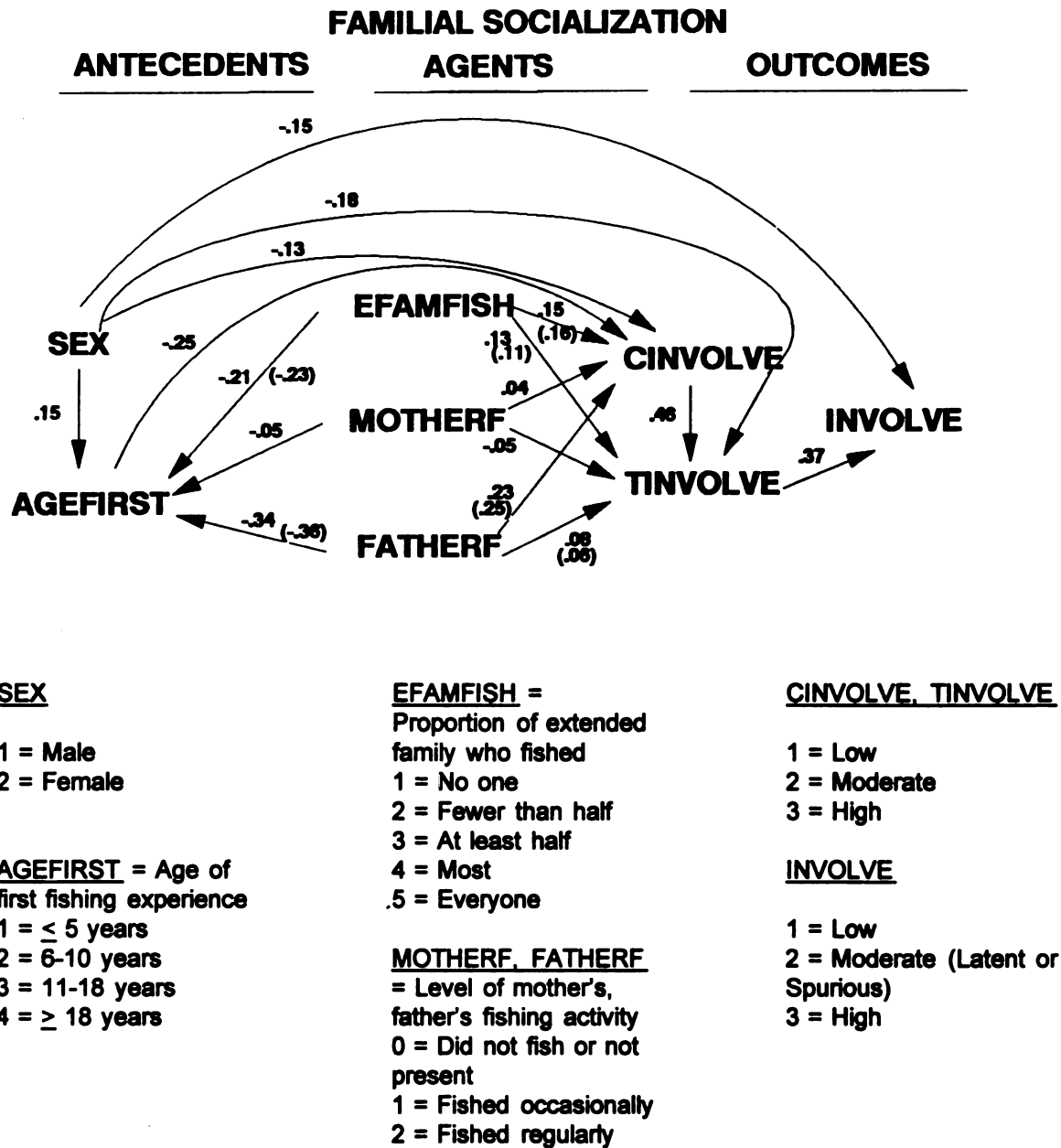


Figure 4-2. Path coefficients for model of familial fishing socialization. (Numbers in parentheses represent path coefficients for model with MOTHERF variable deleted.)

Table 4-74. Matrices for testing path model of familial fishing socialization. (Numbers in parentheses represent correlations for model without MOTHER variable. na= correlation not available/not relevant without MOTHER in path model.)

Observed correlations

	SEX	EFAMFISH	MOTHERF	FATHERF	AGEFIRST	CINVOLVE	TINVOLVE	INVOLVE
SEX								
EFAMFISH	.02							
MOTHERF	.13	.46						
FATHERF	.03	.46	.47					
AGEFIRST	.13	-.39	-.29	-.46				
CINVOLVE	-.15	.37	.27	.43	-.44			
TINVOLVE	-.25	.31	.15	.31	-.32	.56		
INVOLVE	-.24	.20	.06	.11	-.13	.27	.41	

Path coefficients

	SEX	EFAMFISH	MOTHERF	FATHERF	AGEFIRST	CINVOLVE	TINVOLVE	INVOLVE
SEX								
EFAMFISH	0							
MOTHERF	0 (na)	0 (na)						
FATHERF	0	0 (0)	0 (na)					
AGEFIRST	.15	-.21 (-.23)	-.05 (na)	-.34 (-.36)				
CINVOLVE	-.13	.15 (.16)	.04 (na)	.23 (.25)	-.25			
TINVOLVE	-.18	.13 (.11)	-.05 (na)	.08 (.06)	0	.46		
INVOLVE	-.15	0 (0)	0 (na)	0 (0)	0	0	.37	

Table 4-74 (continued).

Predicted correlations

	SEX	EFAMFISH	MOTHERF	FATHERF	AGEFIRST	CINVOLVE	TINVOLVE	INVOLVE
SEX								
EFAMFISH	.02							
MOTHERF	.13	.46						
FATHERF	.03	.46	.47 (.47)					
AGEFIRST	.13	-.39	-.29 (-.25)	-.46				
CINVOLVE	-.15	.37	.27 (.24)	.43	-.44			
TINVOLVE	-.25	.31	.15 (.17)	.31	-.30	.56		
INVOLVE	-.24	.11	.04 (.04)	.11	-.13	.23	.41	

Errors (Observed - Predicted correlations)

	SEX	EFAMFISH	MOTHERF	FATHERF	AGEFIRST	CINVOLVE	TINVOLVE	INVOLVE
SEX								
EFAMFISH	0							
MOTHERF	0	0						
FATHERF	0	0	0					
AGEFIRST	0	0	0	0				
CINVOLVE	0	0	0	0	0			
TINVOLVE	0	0	0	0	.02	0		
INVOLVE	0	.09	.02	0	0	.04	0	

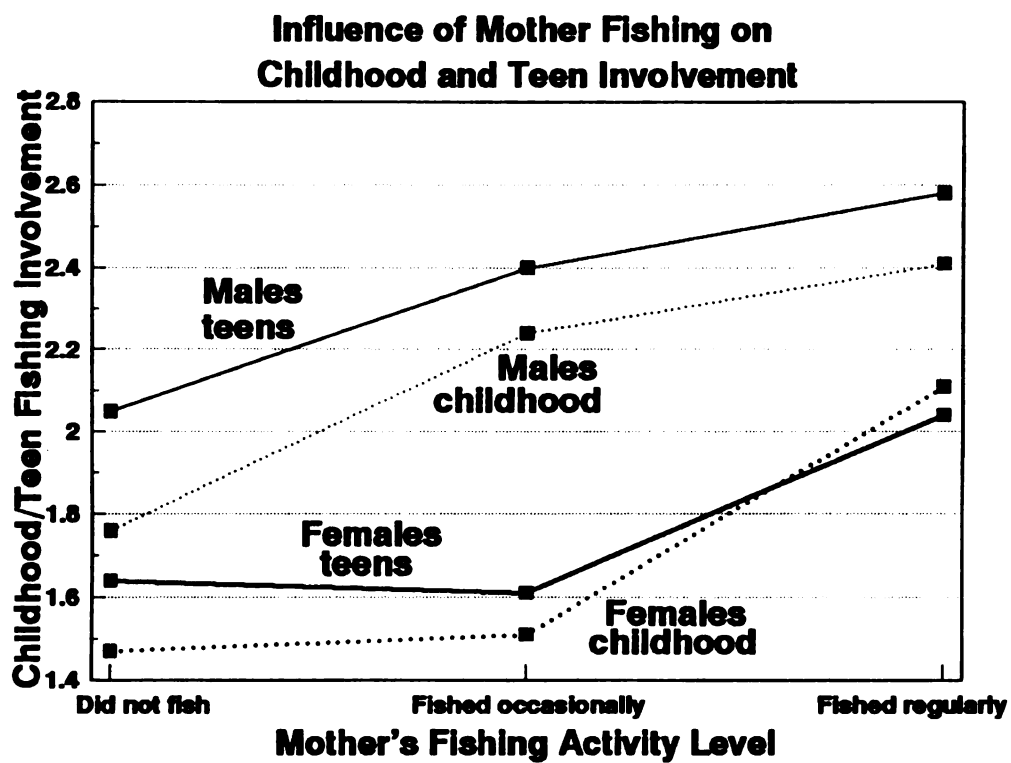


Figure 4-3. Mean childhood and teen involvement by mother's fishing frequency (controlling for sex). Note that sex moderates effect between mother's fishing frequency and childhood and teen involvement.

Summary of Study Findings

A profile of each angler involvement type is summarized in Table 4-75. In summary, those with the highest levels of current fishing involvement included

- males,
- individuals with family fishing backgrounds,
- individuals who (as children or teens) participated in certain fishing-related institutional events (fishing at a clinic, at school, at a youth camp or with a youth organization) or family-based activities (water-related activities; camping with family),
- persons with very early introduction to fishing (even prior to age 5),
- those who had higher levels of childhood and teen fishing involvement,
- persons with greater satisfaction with their earliest fishing experiences,
- and persons who had direct, hands-on contact with fishes during early fishing activities.

Analysis of variance and path analysis provided insights into those variables which are the strongest predictors of long-term fishing involvement. Fishing involvement was most directly related to teen fishing involvement and gender. Childhood fishing involvement was related indirectly to current fishing, by influencing teen fishing involvement. Childhood and teen fishing involvement were both influenced by family fishing socialization agents and by gender. The level of childhood fishing involvement achieved by individuals was also predicted by age of first fishing experience, with younger initiates developing greater childhood involvement in the activity. Age of first fishing experience was substantially lower for males and for those individuals with family fishing backgrounds than for those without such backgrounds.

Table 4-75. Profile of angler involvement types – a summary.

Characteristic	% of Low Involvement Anglers	% of Latent Anglers	% of Spurious Anglers	% of High Involvement Anglers
<u>Antecedent Variables</u>				
Males	74.4	84.4	81.8	93.1
First fishing experience < age 5	34.1	39.5	43.0	45.0
<u>Family Socialization Variables</u>				
Mother fished	38.1	52.5	45.4	49.2
Father fished	70.0	73.4	73.7	77.5
Proportion with most/all extended family who fished	23.2	30.3	28.2	41.0
<u>Fishing Socialization Process Variables</u>				
Attended fishing event	8.9	12.2	16.0	18.8
Fished on school experience	10.0	10.4	6.9	15.2
Fished at youth camp	14.8	19.0	20.1	23.5
Camped with family	62.8	64.9	67.6	72.3
Fished while camping with family	54.4	60.8	62.7	67.8
Planned trip	27.7	36.0	38.6	43.5
Cast own lures bait	75.9	86.3	80.4	86.4
Caught big fish	58.0	65.9	69.7	76.9
Handled fish	76.3	84.4	81.2	85.9
Caught lots of fish	62.4	74.6	74.8	80.0
Ate fish	77.2	86.9	79.6	88.1
Satisfied with early experiences	78.6	86.5	77.9	86.6
<u>Youth Fishing Involvement</u>				
Childhood- fished often, freq., v. freq.	30.1	41.8	34.4	51.9
Teen - fished often, freq., v. freq.	41.3	66.6	61.0	80.3

Study findings specifically related to research questions are summarized below.

RESEARCH QUESTION 1: How are antecedent variables (sex of youth, rural vs. urban residence as a youth, traditional vs. single-parent family as youth, and age of youth at time of fishing introduction) related to fishing involvement and socialization?

Fishing involvement:

- Males and individuals with very early initial fishing exposure (before age 5) had the greatest current fishing involvement, greatest mean rating of fishing importance, and reported the greatest total days fishing in 1991-92.

In addition, males significantly reported greater consistency in license purchase and fishing behavior over the past five years, greater intentions for fishing in the next license year, and greater interest in going fishing more often. Males more frequently reported that they watched fishing or outdoor shows on television, visited stores to view equipment, talk with friends about fishing, read about fishing, spend money on fishing, and maintain membership in fishing organizations. Males also agreed to the following statements more frequently than females: "fishing says a lot about who I am," "I find that a lot of my life is organized around fishing," and "my enjoyment of fishing influences where I live."

- There were no differences among anglers from rural vs. urban areas or among anglers from different family types (single-parent vs. "traditional") in current fishing involvement.

Residence area during youth was related to one current fishing commitment variable: anglers who had grown up in urban areas were more likely to maintain current membership in fishing organizations.

- Males and individuals with very early fishing introduction had greater childhood and teen involvement in fishing. Lower proportions of anglers who grew up in rural-farm and urban areas (versus rural-nonfarm or small town areas) reported fishing frequently or very frequently in teen years. More males than females and more anglers from urban areas than from any other residence area during youth reported an increase in teen fishing activity level.

- There were no differences in childhood fishing involvement between anglers from rural vs. urban backgrounds or between anglers who grew up in different family types . Nor were there differences in teen fishing involvement between anglers from different family types.
- Males and anglers from rural-nonfarm residence areas during youth had the earliest introduction to fishing. Females and anglers from rural-farm and urban areas tended to be initiated into fishing at later ages.

Fishing socialization – Exposure agents:

- More females than males reported that their mothers had high levels of fishing activity. There were no differences between the sexes in how often they reported that immediate family members fished, fathers fished, or that high proportions of extended family fished.
- Fewer anglers who grew up in rural-farm and urban areas (versus rural-nonfarm or small town areas) reported that immediate family members fished, mothers fished, fathers fished, or that high proportions of extended family fished.
- More anglers who grew up in "traditional" families (versus single-parent families) reported that their mothers did not fish. There were no differences in whether immediate family members fished or in proportion of extended family who fished among anglers from different family types.
- Age at fishing initiation decreased significantly with presence of immediate family members who fished, higher proportions of extended family members who fished, and higher levels of mother's and father's fishing activity.

Fishing socialization – Nature of exposure:

- Those individuals with the earliest fishing exposure reported the greatest mean satisfaction with earliest fishing experiences. There were no differences between the sexes, or among anglers from different residence area backgrounds or family types in their satisfaction with early fishing experiences.

- Childhood exposure to particular fishing activities varied significantly with gender, resident area background, and family type while growing up.

Females less frequently reported having particular hands-on experiences related to their earliest fishing outings than did males; females less frequently reported handling fish and cleaning fish, and they more frequently reported problems with equipment, and being afraid of water. Anglers from urban backgrounds more frequently reported having to follow rules than did anglers from other residence backgrounds. Higher proportions of males than females had attended fishing clinics or other events, fished on a school-related experience, fished at summer camp or with a youth organization, fished while camping with family. Anglers from urban and small town areas while growing up more frequently reported attending fishing events, whereas anglers from small town backgrounds most frequently went camping with family and fished while camping with family.

RESEARCH QUESTION IIA: How is the presence of fishing socialization agents (sources of early fishing exposure such as family and peers) related to fishing Involvement?

- Those anglers with familial socialization agents present while growing up (immediate family who fish, mothers and fathers who fish, higher proportions of extended family who fish) had greater childhood and teen fishing activity and mean ratings of fishing importance.
- More high involvement anglers reported that, during their youth, immediate family members (and fathers) had fished. This group also reported that a higher proportion of extended family had fished. Angler involvement types did not differ in the proportions reporting that mothers fished.
- Mean current importance of fishing was highest for those individuals who reported that fathers fished and that high proportions of extended family fished. Mean total days of fishing per year was highest for those who had immediate family who fished, mothers who fished, fathers who fished, and extended family who fished.

RESEARCH QUESTION IIB: How do socialization processes (the nature and quality of early fishing experiences) affect teen and current fishing involvement?

- Participation in particular fishing exposure activities during childhood was related to higher current fishing involvement, current fishing importance and current fishing frequency (total days fishing in 1991-92).

Higher current fishing involvement was associated with having done the following activities while growing up: attending a fishing clinic or other event, fishing while on a school-related experience, fishing at a summer camp, fishing with a local youth club going camping with family, and fishing while camping with family.

- Participation in particular activities during earliest fishing outings was related to higher current fishing involvement, current fishing importance, and current fishing frequency.

High levels of current fishing involvement were associated with the following experiences during earliest fishing outings: helping plan the outing, casting and handling own lures and bait, catching big fish, catching lots of fish, handling fish caught, and eating fish caught.

- Those who reported satisfaction with earliest fishing experiences had higher current fishing involvement and higher current ratings of fishing importance.

RESEARCH QUESTION III: What are the relationships between youth involvement in fishing and the individual's current involvement in fishing?

- Levels of current fishing involvement were highest for those individuals who reported high levels of childhood and teen fishing activity, and high ratings of fishing importance in childhood and teen years. A greater proportion of high involvement anglers than other involvement types reported their fishing activity level had increased during teen years.

RESEARCH QUESTION IV: How do recreational constraints influence expression of fishing involvement in teens and adults?

- Constraints reported to negatively affect fishing activity in teen years included changes in available time due to other recreational or social activities, due to school obligations, and due to family commitments. Factors which increased fishing activity in teen years included gaining more personal freedom to do desired activities, gaining

access to transportation, having changes in the types or amounts of fishing opportunities nearby, and changes in their own interests and preferences.

- The constraint to current fishing activity with the greatest mean score for all anglers was not having enough time due to work commitments. Concern about fish contaminants was rated moderately high by all fishing involvement groups.
- Low involvement anglers had the highest mean scores for time constraints due to family and due to other recreational or social activities, and for the constraints of "no good fishing near home," "I rarely catch the size or type of fish I want," "I don't have fishing equipment," "I lack others to go fishing with," "I lack information about where to go fishing," and "I don't have enough fishing knowledge or skills." Spurious anglers had the highest constraint scores for "bad weather often interferes," and "I don't think there's enough fish of legal size."
- High involvement anglers reported constraints of crowded fishing areas, not enough fish of legal size and costs of transportation.

RESEARCH QUESTION V: What are the relationships between early fishing socialization, degree of fishing involvement and the frequency of environmental stewardship behaviors?

- A higher proportion of anglers than the American public reported that they sort trash to remove recyclables, avoid buying products from environmentally irresponsible companies, and contribute money to environmental organizations.
- A higher proportion of high involvement anglers than low involvement anglers reported that they contact management agencies and legislators, avoid buying products from environmentally irresponsible companies, contribute money to environmental organizations, write letters to politicians about environmental issues, participate in clean-up or habitat improvement projects, and take part in legal activities regarding the environment.

- Anglers with immediate family members who fished while they were growing up more frequently reported that they contribute money to and maintain membership in environmental organizations than did anglers without family fishing socialization agents present while growing up.

Summary of Differences Among Age Cohorts

Antecedents

- The greatest proportions of female respondents were present in the young Baby Boomer (ages 25-34) and the Depression Era (ages 55-64) cohorts. The highest proportions of anglers from a rural-farm background were present in the oldest age cohorts. The highest incidence of anglers from single-parent families was in the Baby Bust (ages 19-24) and WWI (ages 65+) cohorts.

Socialization

- Fewer anglers $\geq$ age 65 reported that, while growing up, they had immediate family members who fished; the WWI (ages 45-54) cohort reported the lowest frequency of mothers who had fished. More Baby Bust anglers reported mothers who fished and high proportions of extended family members who fished. Those respondents age 19-34 reported greatest frequency of fathers who had fished.
- Higher proportions of younger age cohorts than older cohorts reported doing the following activities as youths: attending a fishing clinic or derby, fishing at a trout farm or other such facility, fishing as part of a school-related experience, participating in water-related activities (fishing) at a youth camp, camping with family, and fishing while camping with family. The only activities with increasing participation by females over the decades were participating in water-related activities, camping with family, and fishing while camping with family.

Outcomes

- Younger age cohorts reported significantly greater participation in fishing during childhood and teen years; older age cohorts more frequently reported they did not remember their early fishing activity levels.
- Baby Boomers (ages 35-44) had significantly higher proportions of low involvement anglers than any other cohort. The proportion of latent anglers increased with age.

CHAPTER 5

DISCUSSION

General Limitations of This Study

Some general limitations of this study should be noted. The sampling frame for this study consisted of licensed anglers only and thus represents a restricted sample (Figure 5-1). When drawing conclusions about results from this study, care must be taken not to generalize these results for all Michigan residents. It is possible that a different sampling frame encompassing licensee "dropouts" and/or those who have never been licensed might lead to a different picture of the possible influences on degree of long-term fishing involvement. For example, in this study the proportion of licensed anglers who grew up in urban areas (less than 30%) was about half the size of the population of all Michigan youth from urban areas (about 60%); this result suggests that there is some factor "constraining" recruitment and participation of urban youth in fishing. What is unknown, however, due to this study's restricted sample, is the frequency distribution of youth residence for those individuals who tried fishing but quit.

Another important point to note regarding the sampling frame for this study is that, because of the sample stratification used, respondents to this survey are not necessarily representative of all current fishing licensees in Michigan. In this study, we over sampled young anglers (who had had a lower response rate to the pilot survey) in order to ensure we had enough respondents in younger age cohorts for cohort analysis. In addition, we selected disproportionately higher numbers of daily angling license holders to ensure we had enough respondents with low fishing frequency for our analyses.

One study limitation is that only a moderate response rate was achieved in this study. Some response bias was observed. Non-respondents differed from respondents in general fishing activity level (Appendix VI). In general, respondents had high participation levels compared with levels reported in other angler studies. Mean days spent fishing in 1991-92 was 36 days for respondents (median was 24 days); U.S. anglers spent an average of 14 days fishing in 1991, and an average of 21 days in 1985 (U.S. Fish and Wild. Serv. 1988 and 1993). Results for respondents to this Michigan study may be slightly skewed toward more active fishing participation than is typically observed. Yet, relationships between socialization variables and participation were still detected. In samples with even greater representation from low frequency anglers, these relationships might be even stronger.

Other limitations of this cross-sectional study are that many items were based on self-reports rather than actual measures (i.e. of fishing activity levels), and that the study was based on a retrospective methodology (i.e. asking individuals to recall events from very early periods in childhood). These aspects may present threats to reliability and validity of some measures in the study, and may limit inferences to be made regarding causal relationships among some variables. In particular, memories of older respondents may be less accurate than those of younger respondents. In fact, frequency of "don't remember" responses increased with age, and older age cohorts more frequently reported that their memory of early experiences was vague. Other problems with recall bias (particularly on items related to childhood years) may include deterioration, distortion or intensification of descriptions of events over time (Williams and Stith 1980). Not only may some individuals want to represent themselves in a positive light with regard to early fishing participation, but there may be differential recall of positive events (Williams and Stith 1980; Fridgen 1984). Negative events may be less likely to be recalled with the same level of intensity of positive events; furthermore, memory of negative events may fade disproportionately over time, while positive experiences are recalled with more accuracy (Fridgen 1984).

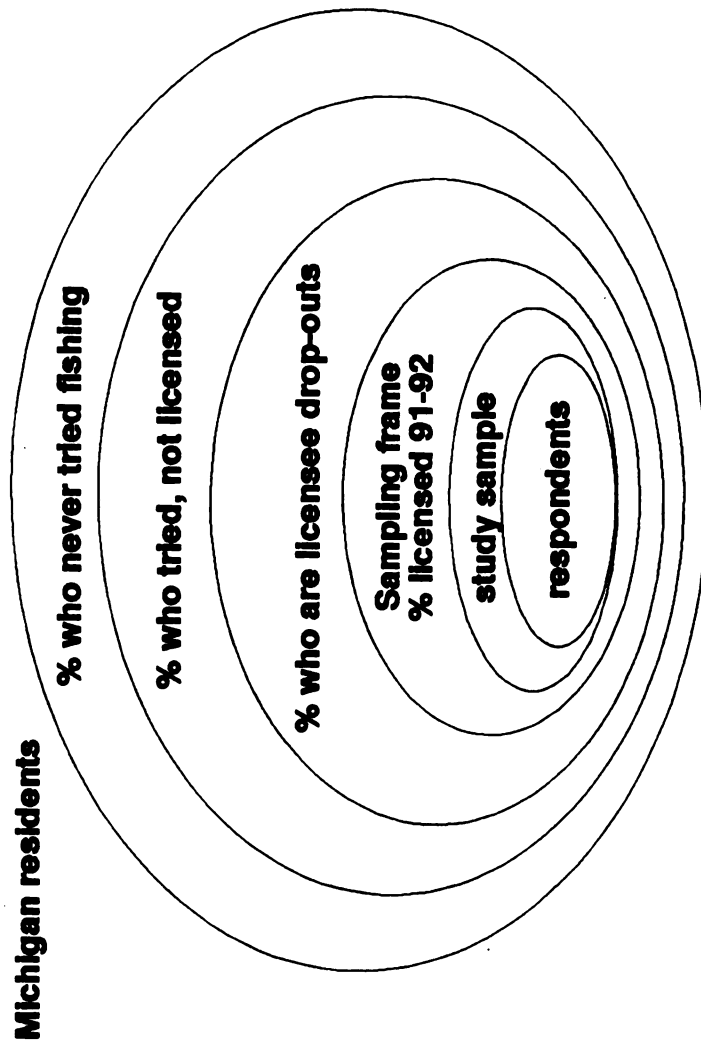


Figure 5-1. Sampling frame for this study within the context of population of all Michigan residents.

In spite of these limitations to this study, the overall response rate (59%) and the variance in level of fishing involvement were adequate to address the research questions, advance our understanding of angler recruitment, and aid in refining the questions which require further research. Within the limitations of the study, a conservative interpretation of results follows.

Predictors of Current Fishing Involvement

The typology of angler involvement appears to provide a useful dependent variable for considering factors influencing fishing recruitment. This typology was based not only on annual (1991-92) frequency of fishing participation, but also on attitudinal commitment to fishing. This typology classified angler respondents into four types: high involvement, spurious, latent and low involvement anglers. High involvement and spurious anglers are alike in that both groups participated frequently in fishing in 1991-92 (25 or more days); they differ in that spurious anglers lack attitudinal commitment to fishing. Latent anglers, however, have high attitudinal commitment to fishing, but, for certain reason(s), do not participate as frequently as high involvement or spurious anglers. Low involvement anglers have both low attitudinal commitment to fishing and a lower level of participation; thus, low involvement anglers are least likely to remain involved on the long-term with fishing, and may be more likely to desert the activity.

This typology was validated by several study findings (Table 4-75). Current fishing involvement was also predicted by presence of certain fishing socialization agents during youth. In particular, high angling involvement was associated with youth who had immediate family members who fished, fathers who fished frequently, and high proportions of extended family members who fished. Current fishing importance was predicted by having fathers who fished frequently and by presence of extended family who fished. Presence of familial fishing socialization agents, then, probably has a direct effect on current (or lifetime) fishing

involvement. In addition, those individuals with familial fishing agents present during youth, had greater youth fishing involvement which, in turn, influenced level of fishing involvement.

High current fishing involvement was predicted most strongly by characteristics of respondents' childhood and teen fishing involvement. Frequent fishing activity in childhood and teen years was highly related to continued fishing involvement. Furthermore, the earlier an individual started fishing, the greater the long-term involvement with the activity. In fact, fishing initiation prior to age 5 predicts the highest levels of current fishing involvement. Some highly involved focus group participants commented that they don't ever remember not fishing!

Current fishing involvement was significantly related to respondents' participation in some fishing-related activities during youth and to certain exposure events (events during their earliest fishing experiences). Provision of more of these types of experiences in specially designed programs may increase children's attitudinal and behavioral involvement in fishing. These experiences should be included in institutionally-sponsored fishing events and in encouraging families who take young children fishing. It appears that agency efforts directed at fishing clinics, encouraging angling programs in schools or at camps, supporting youth organization fishing offerings and promoting family camping and fishing could increase lifetime angling involvement. These efforts would be enhanced if they were targeted for young children (and families with young children) and if activities included hands-on, fish-related experiences such as providing many (perhaps large) fish to catch and handle, and providing opportunities to plan outings, to cast and handle lures and bait, and to eat fish caught.

Some results provided an optimistic outlook for the prospect of fishing recruitment from future generations. Analysis of fishing socialization by age cohort of respondents indicated that the presence of familial socialization agents and the frequency of participation in various fishing-related events or activities have increased over the decades. For example, younger age cohorts were more than twice as likely as older cohorts to have camped during

youth, an activity which was observed to be related to later fishing involvement. Today's younger licensed anglers appear to more frequently experience activities which promote high fishing involvement than did earlier generations. Of course, this finding is subject to the limitations of differential recall (i.e. younger generations may have better recall of having participated in such activities). This finding does not mean that agencies should drop targeted programs and strategies that encourage fishing recruitment. Rather these programs may make important contributions to angler recruitment, so agencies may desire to maintain and develop such programs to meet the needs of succeeding generations.

One antecedent variable, gender, was a direct predictor of current fishing involvement. Males had the greatest current fishing involvement and reported greater consistency in license purchase and fishing behavior over the past five years. The mechanism by which this sex difference in fishing involvement may have developed is sex role socialization – the process of transmitting and enforcing different norms and values to the sexes as they develop patterns of behaviors considered "appropriate" for each sex. Evidence for sex role socialization in fishing behavior was found in this study. Females differed from males in most socialization agent and process variables. For example, female respondents more frequently than males reported their mothers had high levels of fishing activity. This suggests that having a female role model or mentor may be particularly important in influencing girls' early fishing involvement. Females less frequently than males reported that they had participated in institutionally-sponsored fishing events or had had certain hands-on experiences (such as handling or cleaning fish). Young female focus group members highlighted that the predominantly older male image of fishing had a negative influence on their desire to participate. Female survey respondents had an older mean age of fishing initiation than males, and several female focus group members commented that their recruitment came in early adulthood, when a spouse or "significant other" took them fishing or when they began fishing in order to spend time with their own children. Sex role

socialization appears to have occurred for even younger generations of female respondents, since there was no increased exposure to these events in the younger generations of females.

Implications of these findings related to sex role socialization are numerous. Fishing needs to be promoted to attract diverse audiences in the future. For example, promotional images of angling should include women and girls actively participation in fishing. Institutionally-sponsored events could be carefully designed to include (or even target) females; perhaps targeting young women with young children or targeting girls' youth organizations such as Girl Scouts, would be most effective in introducing more individuals to fishing. Mentorships linking highly involved female anglers with young recruits might be most effective in developing long-term involvement in fishing among females.

Discussion of Other Study Findings

Fishing Activity During Adolescence

The teen years appear to be especially critical to maintaining fishing involvement. Many respondents reported a decline in fishing activity levels during teen years, and identified the greatest constraint to have been competition from other social or recreational activities. The segment which reported the lowest levels of teen fishing activity consisted of anglers who grew up in urban or suburban residence areas (where perhaps there are the greatest numbers of competing social or recreational opportunities for teens). The teen years appear to present a sort of "bottleneck" for development of fishing involvement. However, certain factors were reported to increase fishing activity during teen years. These included increased freedom to do what one pleases and increased access to transportation.

Certain experiences, especially if provided to teens, may help youth develop into highly involved anglers by adulthood. There is support for providing an array of fishing-related experiences (such as reading about fishing, cooking and eating fish, handling lures, and opportunities to fish with youth organizations) in order to affect both attitudinal

commitment to fishing and activity level in teen years, particularly. Respondent satisfaction with early fishing experiences was greatest for those who had had some of these types of early fishing exposure experiences. Respondent satisfaction, in turn, was related to long-term fishing involvement. Recall of satisfaction with early experiences, however, may be subject to bias; high involvement anglers may differentially recall more of their positive satisfying events. Future research could focus on panel studies of youth and measure post-experience satisfaction levels and subsequent fishing activity.

Effect of Residence Area During Youth on Angling Socialization

Antecedent variables provide further insight into possible influences on fishing recruitment. Anglers who grew up in urban or in rural-farm settings more frequently reported that they lacked family fishing socialization agents while growing up. Parents in rural farm families may be too busy to go fishing and take their children; parents in urban areas may lack the fishing background necessary to take on a leadership role in introducing their children to fishing. Urban parents may lack knowledge about accessible fishing sites, as well. Fishing programs could be designed to target these groups and present fishing as a recreational activity which is easy to learn and takes little time to do.

Growing Up in "Traditional vs. Single-Parent Families and Effects on Fishing Participation

Interestingly, family type while growing up was not related to childhood, teen or current overall fishing involvement of respondents. Fishing behavior, however, did differ somewhat; anglers who had grown up in single-parent, male-headed families fished significantly more days in 1991-92 (mean=48 days) than did those from female-headed households (mean=39 days) or those from "traditional" families (mean=34.5 days). Since respondents do not necessarily represent the Michigan population in terms of fishing interest, activity or demographic variables, the possibility still remains that growing up in a single-parent family (particularly one with a female head-of-household) may contribute to failure to recruit nonanglers or angling "dropouts". However, the lack of support for the hypothesis that single-parent family status diminishes recruitment and fishing involvement may be good news

to resource agencies concerned about demographic trends and the future of fishing recruitment. Additional "good news" was found in analysis of cohort's participation in certain fishing exposure activities. Age cohort analysis showed that younger respondents more frequently than older respondents reported growing up in a single-parent home and in an urban or suburban area, but they also more frequently reported that their mothers and fathers fished, and that they had more exposure to fishing shows on television. Increased availability of fishing exposure agents such as mothers who fish, fathers who fish, television programs about fishing and the outdoors, and fishing-related activities through schools, agencies and organizations may be counteracting any potentially negative effects for today's youth of growing up in a single-parent home or in an urban area. With continued programming to recruit and retain young anglers, there is a hopeful future for fishing recruitment in the state.

Angling Behavior and Environmental Stewardship

A limited analysis of environmental stewardship activities shows that active, involved anglers are more active stewards than low involvement anglers and the general American public. In particular, involved anglers took part most frequently in those activities which might be considered more directly related to aquatic resource stewardship. An interesting discrepancy was noted, however, for the activity of sorting recyclables. Frequency of participating in recycling was **inversely** related to level of fishing involvement. Perhaps other, extraneous factors, such as accessibility of community recycling programs, influence this stewardship behavior. Or, perhaps this relationship is confounded by the effect of gender on participation in recycling and fishing. For example, perhaps male anglers who are highly active in fishing participate less often in household tasks (such as recycling); females in these active-angler households may also be less likely to recycle. In spite of this aberrant inverse relationship, level of angling involvement appears to be related to certain environmental stewardship behaviors, particularly those that can be most closely related to aquatic topics such as contacting a management agency, contributing money to organizations, taking legal

action, or participating in a clean-up or habitat improvement project. These findings that fishing involvement is related to stewardship provide agencies greater justification for being concerned about angler recruitment and allocating resources toward fishing and fisheries education.

Implications for Fisheries Management

A critical question for fisheries managers, based on these results, is whether or not it is desirable to devise an aggressive plan to recruit anglers. High involvement anglers report that an important constraint on their increased participation is that fishing areas are crowded and that there are not enough desired fish available. Several anglers added notations in response to open-ended questions that decreased fish abundance in their fishing areas has led to a decline in their fishing participation. A few even questioned the need for this study given angler crowding in some areas. If a targeted effort as fishing recruitment is made by MDNR, it would be critical to gain the support of anglers in this effort by making them aware of the rationale for such a recruitment program. If possible, newly-recruited anglers could be directed (through information channels such as brochures) to certain fishing locations such that involved anglers' perception of crowding or actual crowded conditions were not exacerbated.

In spite of an apparently small contingent of fisheries constituents concerned about crowding, a strong case can be made for increasing not only angler recruitment, but diversity as well. The findings in this study suggest that angling participation is related in some way to aquatic stewardship. Further stewardship benefits would result if diversity of the angling population were increased by including more females, minorities, and urban residents. Acquainting these groups which are currently underrepresented in the angler ranks with aquatic environments and issues will provide more individuals the opportunity to aid in resource decision-making. To reach these constituencies, fishing and fisheries-related programs can be maintained, broadened and tailored to appeal to succeeding generations.

Given the need to reach these segments of the population, a number of strategies may be appropriate. For example, promotional efforts might strive to improve the image of fishing and emphasize the multiple benefits of fishing. The image of fishing could be broadened to show involvement by diverse populations (male and female, urban to rural, various ethnic minorities). Fishing could be positioned as an outdoor activity for all residents of Michigan, regardless of age; furthermore, it is an activity compatible with simultaneous pursuit of other outdoor activities such as camping and boating.

Promotional efforts might also serve to remove or diminish the effects of the most commonly reported constraints (lack of time due to work, family or other social or recreational activities). Fishing might be promoted as a means of achieving other important personal goals such as spending time with family and friends. A message of "Take a little time out for fishing.." may show these market segments that fishing is easy and can take little time away from accomplishing necessary tasks such as work. Promoting fishing as an activity with multiple nonconsumptive benefits (such as enjoyment of the outdoors and wildlife) and encouraging catch-and-release fishing might appeal to those individuals who rate concern about contaminants in fish as a constraint to participation. Finally, promotional or educational programs could be targeted toward those who reported the constraints of lack of knowledge, lack of equipment, and lack of fishing partners. Little is known about the effectiveness of such programs; rigorous research and evaluation on effects of such images on participation is needed.

Implications for Aquatic Resource Education

Aquatic resource education programs to facilitate development of angler involvement take a variety of forms. No programs, however, have been fully evaluated as to the extent of their contribution to development of long-term angling participation or stewardship behaviors. The following suggestions are based on findings from this study which suggest appropriate

target audiences for education programs, and on information about some existing aquatic resource education programs in the United States and Canada.

Perhaps a useful model for considering such programs may be adapted from models of epidemiological phenomena and intervention strategies (Figure 5-2). Epidemiological models consider sources and types of exposure to a disease agent, frequency and duration of exposure to disease agents, and outcomes of exposure in developing plans to intervene in the progression of a disease (Kleinbaum et al. 1982). Primary intervention programs strive to affect the number of exposures an individual has to a certain agent or activity (in this case, fishing). Secondary intervention strives to increase the duration and frequency of exposures. And tertiary intervention might strive to help individuals who lack fishing exposure to develop the type of aquatic understanding and stewardship that fishing fosters.

Based on the results of this study and on Michigan demographics, high and medium priority target audiences for aquatic education programs are outlined in Table 5-1. Specifics of program offerings are discussed below.

Primary intervention programs to encourage exposure to fishing include fishing clinics, derbies and other fishing-related events and exposure experiences. In Michigan, Free Fishing Week clinics are sponsored throughout the state in an effort to promote fishing exposure. The Fisheries Division of MDNR provides substantial support for these clinics in the form of publicity, materials and field staff. Other examples of primary intervention programs are "National Free Fishing Week" promotional events, the "Get Hooked on Fishing Not on Drugs" campaign by the Future Fisherman Foundation, the federally-sponsored "Pathway to Fishing" program where youth traverse a one-hour experiential "trail" to try fishing and related activities, and a variety of school-based one-time fishing experiences using several curriculum packages. These programs should be continued and perhaps expanded. Other more innovative means of exposing young families and children to fishing should be initiated. Because of the importance of very early fishing exposure in contributing to

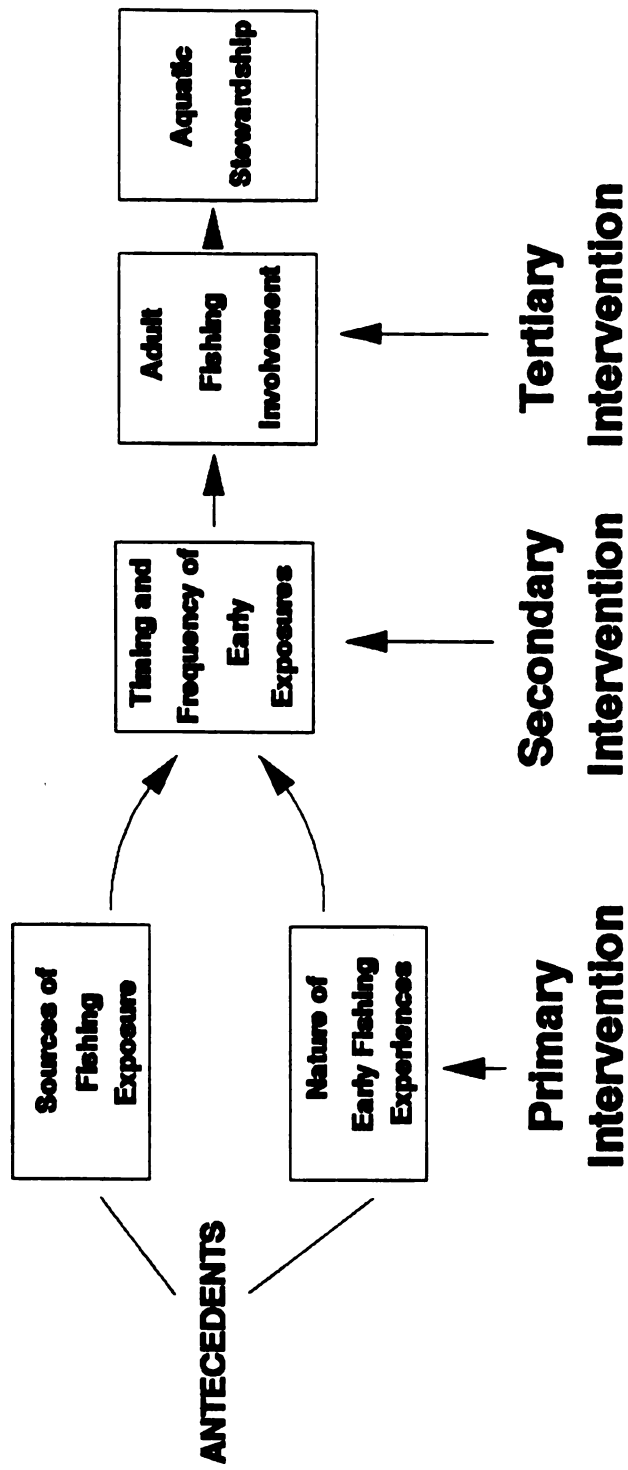


Figure 5-2. Model of elements influencing fishing activity and aquatic stewardship. Types of programmatic interventions to enhance long-term fishing involvement. (Based on Kleinbaum et al. 1982.)

Table 5-1. Rationale and programs for targeting aquatic resource education efforts in Michigan. Target groups are listed in order of priority, from highest priority to groups of medium-high priority.

Target Group	With Programs to...	Rationale/Justification
Teens (Highest priority)	Continue fishing participation once introduced Deepen fishing involvement Remove barriers to participation	- Teen fishing involvement was best direct predictor of long-term involvement. - Over 80% of Michigan middle school students had tried fishing. - High involvement anglers more frequently reported their fishing activity had increased in teen years. - Participation was more "volatile" for teens from small town and urban areas; more of these youth reported their activity had changed in teen years. - Early adolescents are exploring life interests and developing patterns of avocational behavior.
Urban audiences	Increase family-based fishing exposure Increase institutional fishing exposure Continue fishing participation once introduced	- Over 60% of Michigan population under age 18 resides in urban areas. Yet this large audience is under-represented in fishing population. Only about 30% of anglers reported growing up in an urban area. - Anglers from urban backgrounds had less hands-on fishing experiences, and less of some fishing exposure experiences than other anglers. - Fewer anglers from urban areas had family fishing backgrounds.
Females	Introduce girls to fishing at younger age Increase institutional exposure (at youth camps, at school, at clinics) Involve mothers and other female role models in fishing regularly	- Females constitute approximately 50% of the population. - Gender was significantly related to childhood, teen and long-term fishing involvement. - Females had less institutional exposure to fishing during youth and fewer reported having hands-on fishing experiences. - Younger female age cohorts had no greater exposure to such experiences than older cohorts. - Childhood and teen involvement of females was contingent upon regular fishing activity by mothers.

Table 5-1. (continued).

Young families	Increase mothers' fishing frequency (thus influencing girls' childhood and teen fishing involvement) Maintain and increase introduction of youth into fishing at very young age (even $\leq$ age 5)	- Most anglers were introduced to fishing before age 10, and many were initiated prior to age 5. - Early initiation is related to greater childhood fishing involvement, which, in turn, is related to greater teen and long-term involvement. - Greater fishing activity level of family members leads to earlier introduction of anglers into fishing.
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long-term fishing involvement, perhaps programming at daycare and preschool facilities should be considered.

Secondary intervention programs provide longer-term, repeated exposures to fishing and support for development of fishing involvement. These programs operate on the premise supported by this study that increasing childhood and teen fishing activity levels will lead to increased overall fishing involvement. Examples of existing programs include fishing "badges" and learning activities in Boy Scouts, 4-H fishing and environmental education clubs, after-school programs, and sportsman club sponsored programs. Michigan DNR Fisheries Division has piloted a secondary intervention program with the 1993 summer program of Lansing Parks and Recreation Department. In this program, youth received several hours of fishing instruction and experienced at least one fishing outing. Participants also received equipment and materials to support their continued activity in fishing. Other examples of secondary intervention programs include New York states's SAREP (Sportfishing and Aquatic Resource Education Program), which uses Master Anglers to form local youth fishing clubs, and Minnesota's MinnAqua, which delivers programs through local youth clubs, schools, and urban programs. Future development of secondary intervention programs in Michigan could adapt these successful program models, could be family-centered and community-based, and could include important anticipatory and post-fishing experiences shown in this study to be related to long-term fishing commitment.

Tertiary intervention programs should strive to develop ethical aquatic stewardship practices in anglers and nonanglers alike. Examples of these programs include elements of MinnAqua and SAREP, as well as Ontario's "Fish Ways" program, which develops in youth an understanding of aquatic ecosystems, fisheries management, and aquatic stewardship ethics. Programs such as these should be provided throughout Michigan, and could even target low involvement anglers and nonanglers.

In order to accomplish these programs, agencies and organizations in other states have forged unique partnerships of varying success. SAREP and MinnAqua involve formal agreements between resource management agencies and the university-based Cooperative Extension Service in each respective state. "Fish Ways" is an outreach program of Ontario Ministry of Natural Resources in partnership with Ontario schools. Local and state fishing-related organizations, youth groups, agencies, and private retailers and businesses such as General Motors have cooperated in sponsoring clinics and derbies. A partnership between MDNR and Michigan State University's Department of Fisheries and Wildlife could provide unique opportunities for fishing and aquatic education outreach programs. Such partnerships will need to continue into the future and even be broadened if we are to continue to try to inoculate today's youth with an appreciation for fishing.

Future Research Needs

In spite of the existence of many types of programs to encourage development of angler involvement, no programs have been formally evaluated as to their impact on individuals or on groups of individuals with respect to their angling involvement. In the future, evaluation of these programs, perhaps using innovative experimental designs, will provide further information on the specific mechanisms influencing development of fishing involvement. Research questions regarding program evaluation might include the following. What program elements influence and support familial fishing socialization? Can non-familial fishing socialization experiences (such as clinics, educational programs through schools, camps or youth organizations) substitute for family-based fishing socialization? What are the influences of programs on teens, urban youth, females, and young families?

Future research should take advantage of longitudinal designs, as well. Panel studies, perhaps done in conjunction with intervention programs to develop fishing involvement, should be considered. These longitudinal studies should be done within the

context of family ecosystems, allowing a richer description of family-related fishing variables and the dynamic processes of fishing socialization. Many questions require further study. Is there a particular event or specific developmental stage during which a person "becomes an angler"? How does proximity to water resources affect development of fishing involvement? What, specifically are the processes of fishing socialization (i.e. social modelling, etc.)? If single-parent families are further segmented and more fully described on the basis of time in child's life when single-parent status occurred or duration of single-parent status for a child's family, are there effects of family types on fishing involvement?

Another area which would provide fruitful insight into fishing opportunity factors (factors influencing fishing exposure and involvement) and risk factors (factors negatively affecting fishing recruitment) would be a full-population study of Michigan residents using a case-control design. In this design, a limited number of variables would be selected (perhaps those significantly predicting current fishing involvement), and the population of Michigan residents would be described on the basis of those factors. Variables which need better description include: which variables put a person "at risk" of not being introduced into the fishing population (such as single-parent family status, family income, residence area, exposure variables, family fishing background, etc.). One research question might be: what is the role of negative experiences in influencing negative attitudes toward fishing? Projections of future fishing participation could then be made, and nonanglers and angling "dropouts" could be targeted for particular intervention programs. Finally, regardless of future research design, work should proceed on refinement of the measurement of fishing commitment, benefits sought, constraints to fishing, and stewardship.

A new state licensing database will provide opportunities for future research on angling recruitment. This database is approved for implementation within the next few years (Knickerbocker 1991). This database will allow resource managers the ability to examine and model fishing recruitment by age cohort and to make predictions about future fishing

participation rates based on projected changes in Michigan population age structure and other demographic trends. Variables which should be included in this database are current age of individual, age at first fishing license purchase, license purchase behavior over several years, and types of licenses purchased. With these variables, individuals can be tracked in their fishing participation profiles from the time they are youths to later in adulthood. Various research questions pertaining to fishing participation levels throughout the family life cycle may then be addressed. In addition, this database will allow for easy sample selection to address other research questions identified in the future.

In spite of optimistic findings in this study which point to increased exposure of younger generations to fishing, the future of fishing and aquatic stewardship are by no means assured. Agencies and organizations should remain concerned about the future of our fishing heritage and our aquatic resources. As agency budgets decline and management issues become more complex, an involved and informed fisheries constituency which is supportive of proactive management is becoming even more important to the future success and quality of our resource base. As National Wildlife Federation president Jay Hair states:

"If we, as individuals, don't step forward to mentor a youngster, teach just one person to enjoy nature, understand fish and wildlife needs, and perhaps, pass on our hunting and fishing heritage, who will?...We are approaching a strategic crossroad that will affect all generations to come. We simply will not be effective at maintaining wide public support for environmental protection, or consumptive use of fish and wildlife for that matter, unless we help others see the fundamental environmental issues from the vantage point outdoor experiences provide (Hair 1991:2)."

Developing effective programs to achieve these goals is paramount to the future of our shared aquatic resources.

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**YOUTH RECRUITMENT INTO FISHING:
THE INFLUENCE OF FAMILIAL, SOCIAL AND ENVIRONMENTAL FACTORS AND
IMPLICATIONS FOR EDUCATION INTERVENTION STRATEGIES TO DEVELOP AQUATIC
STEWARDSHIP**

Volume II

By

Shari Lea Dann

A DISSERTATION

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

DOCTOR OF PHILOSOPHY

Department of Fisheries and Wildlife

1993

APPENDICES

APPENDIX I

Approval letter from UCRIHS.

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

June 4, 1992

Shari Dann
Ben Peyton
13 Natural Resources Bldg.

RE: YOUTH RECRUITMENT INTO FISHING: INVESTIGATING THE PROBLEMS OF FISHING
RECRUITMENT, RETENTION AND INTENSITY, IRB #91-280

Dear Drs. Dann and Peyton:

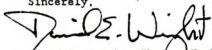
UCRIHS' review of the above referenced project has now been completed. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and the Committee, therefore, has approved this project.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to June 1, 1993. There will be a maximum of four renewals possible. If you wish to continue a project beyond that time, it must again be submitted for complete review.

Any changes in procedures involving human subjects must be reviewed by the UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,



David E. Wright, Ph.D., Chair
University Committee on Research
Involving Human Subjects (UCRIHS)

DEW/pjm

APPENDIX II

Focus group screening survey, discussion outline, and group participation summary.

**TELEPHONE SCREENING QUESTIONNAIRE
MICHIGAN ANGLER RECRUITMENT STUDY
FOCUS GROUP SELECTION**

CONTACT RECORD:

NAME _____

SEX _____

ADDRESS _____

PHONE: _____

CONTACT TRIES: _____

HELLO. My name is _____. I am with the Department of Fisheries and Wildlife at Michigan State University. We're studying participation in fishing, and we received your name from a list of people who have bought fishing licenses in the past. We are interested in talking to people who fish frequently, as well as those who fish little or not at all. The information from this study will help the Michigan Department of Natural Resources predict the future demand for fishing in the state and better manage our fisheries resources. Could you take about five minutes to answer a few questions about your level of fishing activity?

1. I'm going to read five statements about how important fishing is to you as a recreational activity. Tell me which statement is most appropriate to describe you. (CHECK ONE ANSWER)

_____ Fishing is the most important recreational activity I do.
 _____ Fishing is a very important activity to me.
 _____ Fishing is a somewhat important activity to me.
 _____ Fishing is not very important to me.
 _____ Fishing is not at all important to me as a recreational activity.

2. Have you ever gone fishing?

_____ YES (If yes, continue with question 3)

_____ NO.....IF NO: 2a. Are you interested in going fishing sometime or in taking up fishing as an activity?

_____ YES

_____ NO

SKIP TO QUESTION 5 on page 2

3. Which of the following 3 statements describe how often you currently go fishing? (CHECK ONE ANSWER)

☐ I buy a license and go fishing every year.
☐ I buy a license and go fishing once or twice every few years.
☐ I have only tried fishing a few times, and I'm not really an active angler right now.

4. Are you interested in going fishing more often?

☐ YES
☐ UNSURE
☐ NO

5. What is your age? _____

6. In what type of an area did you spend most of your childhood years (prior to age 18)? (CHECK ONE ANSWER)

☐ RURAL (farm or small town less than 10,000 people)
☐ SUBURBAN (or small city greater than 10,000 people)
☐ URBAN (city of greater than 100,000 people)

7. Are you currently a student at MSU or another university or community college?

☐ YES
☐ NO

8. We're inviting several people to take part in a brief discussion group. This group would consist of several people like yourself, and we would meet one evening for a period of about 2 hours. We would meet at MSU in the Conference Room, Room 15 in the Natural Resources Building on _____ from 7:30 p.m. to about 9:30 p.m. WE WILL PAY YOU \$30 TO PARTICIPATE! Your participation in a discussion group is completely voluntary, and your name will be kept confidential and will not appear in the summary report of this study.

Would you be willing to participate in this discussion group?

☐ YES
☐ NO (Reason: _____)
 IF NO - THANK AND TERMINATE CALL

IF YES...

THANK YOU VERY MUCH. We will mail you a personal reminder about our discussion group meeting, and a map showing you how to get onto campus and where to park. You should receive this in just a few days. In the meantime, if you have any questions about this study, let me give you the name of someone you may contact. Do you have a pencil handy? The name is... Shari Dann (517)353-0675. Please contact us at this number if you have to cancel your participation in the discussion group. WE'RE LOOKING FORWARD TO MEETING AND TALKING MORE WITH YOU.

DISCUSSION GUIDE FOR FOCUS GROUPS ON FISHING RECRUITMENT

USED WITH MICHIGAN RESIDENT ANGLERS LICENSED IN 1991-92

May 12 and 13, 1992

Key research questions for focus group on fishing recruitment:

- 1) What factors affect individuals' fishing recruitment?
- 2) How do early fishing experiences influence later fishing participation?
- 3) In general, what is the level of recall of early fishing influences?
- 4) What is the influence of fishing participation and early fishing recruitment on stewardship activities of anglers?

Outline

I. INTRODUCTIONS

- A. Intro. moderator
- B. Orientation - purpose, procedures
- C. Appreciation for time
- D. Participants intro. selves.

II. IMPORTANCE OF FISHING

- A. Recreation activities, in general
- B. Importance of fishing as rec activity
- C. Word/phrases to describe fishing

III. CURRENT FISHING PARTICIPATION

- A. Frequency
- B. Interest in increasing frequency
- C. Fishing behaviors, knowledge, skills
- D. Fishing motivations, enjoyment

IV. GETTING STARTED IN FISHING

- A. Age and source of introduction
- B. Recall of early fishing experiences, of the first experience
 - level of recall
 - how learned about fishing (if late intro.)
 - expectations, satisfactions
 - activities during early fishing experiences
 - other recollections
 - likes, dislikes from early experiences
 - reasons for low levels of exposure
- C. Childhood and teen fishing background variables
 - frequency of exposure to fishing
 - factors affecting fishing while growing up
 - interest level, knowledge, skills
 - description of fishing impressions
 - fishing related activities done

- D. Family and social background in fishing
 - general recreation background
 - family fishing participation and levels
 - family structure (single parent)
 - extended family background
 - friends fishing background
 - urban vs. rural background
 - E. Summation: most important factor(s) affecting fishing recruitment
- V. FISHING PARTICIPATION/NONPARTICIPATION PATTERNS OVER TIME
- A. Changes in fishing during teen years
 - nature of changed participation
 - factors changing participation
 - life events
 - opportunity factors
 - B. Changes in fishing during adult years
 - nature of changed participation
 - factors changing participation
 - life events
 - opportunity factors
 - C. Beginning time of fishing by alone
 - D. Beginning time of initiating fishing trips
 - E. Summation: What is a "committed angler"?
 - who is "committed"?
 - At what point and how did one become committed?
- VI. INCREASING FISHING PARTICIPATION AMONG PEOPLE
- A. Factors which might have increased early participation
 - B. Factors influencing nonanglers group members know
 - C. Changed factors affecting younger cohorts of anglers today
 - D. Factors which might increase children's participation today
 - E. Desirability of increasing fishing participation
- VII. AQUATIC STEWARDSHIP ATTITUDES AND BEHAVIORS
- A. Major environmental concerns
 - B. Political actions
 - C. Making donations
 - D. Consumerism actions
 - E. Ecomanagement actions
 - F. Membership activities
 - G. Persuasive actions
 - H. Direct activities to benefit fisheries
 - I. Influences on environmental concern
- VIII. Closure

FOCUS GROUP PARTICIPANTS SUMMARY

Group I - "Committed Anglers" - Students

Facilitator: Donna Minnis

Name	Participation level	Interested in fishing more?	Importance of fishing	Sex	Residence as youth	Age
Male 1 (M01)	High	Yes	Very important	Male	Rural	19
Female 1 (F01)	High	Yes	Very important	Female	Rural	19
Male 2 (M02)	High	Yes	Very important	Male	Urban	21
Male 3 (M03)	High	Yes	Not very important	Male	Rural	21
Male 4 (M04)	High	Yes	Somewhat important	Male	Rural	21
Male 5 (M05)	High	Unsure	Somewhat important	Male	Rural	24

Original residence:

Male 1 - Lake City, MI

Female 1 - Springport, MI

Male 2 - Sterling Heights, MI

Male 3 - Pinckney, MI

Male 4 - Traverse City, MI

Male 5 - Berrien Springs, MI

Major:

Male 1 - Agribusiness/Nat. Res. Ed.

Female 1 - Agriculture & Extension Ed.

Male 2 - Fisheries & Wildlife

Male 3 - Zoology

Male 4 - Engineering

Male 5 - Resource Development

Group II - "Less Committed Anglers" - Students
 Facilitator: Lisa Grise

Name	Participation level	Interested in fishing more?	Importance of fishing	Sex	Residence as youth	Age
Female 2 (F02)	Low	Yes	Not very	Female	Urban	22
Female 3 (F03)	Low	Yes	Not very	Female	Rural	21
Male 6 (M06)	Low	Yes	Not very	male	Rural	27

Original Residence:

Female 2 - Troy, MI

Female 3 - Fowlerville, MI

Male 6 - Grand Haven, MI/ Kalamazoo, earlier

Major:

Female 2 - Fisheries & Wildlife

Female 3 - S.S./Pol. Sci.

Male 6 - Resource Development

Group III - "Mixed Commitment" Young Anglers
 Facilitator: Lisa Grise

Name	Participation level	Interested in fishing more?	Importance of fishing	Sex	Residence as youth	Age
Male 7 (M07)	High/medium	Unsure	Not very important	Male	Suburban	19
Male 8 (M08)	High	Yes	Somewhat important	Male	Suburban	18
Female 4 (F04)	High	Yes	Very important	Female	Rural	18
Male 9 (M09)	High	Yes	Very important	Male	Rural	18
Male 10 (M10)	High	Unsure	Somewhat important	Male	Suburban	20

Residence:

Male 7 - Charlotte

Male 8 - Holt/Lansing

Female 4 - Dimondale

Male 9 - Grand Ledge

Male 10 - East Lansing (MSU student)

Group IV - "Mixed/Low Commitment" Older Anglers

Facilitator: Donna Minnis

Name	Participation level	Interested in fishing more?	Importance of fishing	Sex	Residence as youth	Age
Female 5 (F05)	Medium/Low	Yes	Somewhat important	Female	Suburban	54
Female 6 (F06)	Medium/Low	Yes	Somewhat important	Female	Urban	32
Male 11 (M11)	High	Yes	Very important	Male	Suburban	45
Male 12 (M12)	High	Yes	Very important	Male	Rural	30
Male 13 (M13)	Medium	Unsure	Very important	Male	Suburban	43

Female 5 - cashier, Lansing

Female 6 - housewife, Lansing

Male 11 - insurance, Dewitt

Male 12 - research scientist (pharmaceutical), E. Lansing

Male 13 - glass, Grand Ledge

Group V - "Committed" Older Anglers

Facilitator: Lisa Grise

Name	Participation level	Interested in fishing more?	Importance of fishing	Sex	Residence as youth	Age
Male 14 (M14)	High	Yes	Somewhat important	Male	Rural	32
Male 15 (M15)	High	Yes	Very important	Male	Suburban	35
Male 16 (M16)	High	Yes	Very important	Male	Rural	42
Male 17 (M17)	High	Yes	Very important	Male	Urban	60
Female 7 (F07)	High	Unsure	Very important	Female	Rural	24

Residence:

Male 14 - Lansing

Male 15 - Lansing (always)

Male 16 - Holt

Male 17 - Grand Ledge

Female 7 - Lansing

Total participants: 17 males; 7 females

APPENDIX III

Pilot survey, cover letter, and results.

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FISHERIES AND WILDLIFE
NATURAL RESOURCES BUILDING
(517) 353-4477
FAX: 517-336-1699

EAST LANSING • MICHIGAN • 48824-1222

September 24, 1992

Dear Sir or Madam:

Enclosed is a survey we are sending to a small number of persons who have recently purchased a Michigan fishing license. **We need your help -- whether or not you consider yourself to be an active angler**, since we are trying to learn why people do or do not go fishing.

As a token of our appreciation, any person who completes and returns this survey will be entered in a drawing for one of several prizes (see enclosed flyer for more details). Please return your survey and the tear-off sheet from the prize flyer in the enclosed stamped return envelope. Your name and entry into the drawing will be separated from the survey return. In this way, your name will be kept confidential and will not be associated with the survey results. If you have any questions about this survey, please do not hesitate to contact either of us.

Of course, your participation in this survey is voluntary. Your completion of the questionnaire constitutes your willingness to participate in the study. However, because we have only contacted a small sample of anglers in Michigan your response is very important. The results of our study will be used by the Michigan Department of Natural Resources to predict the demand for fishing and to manage our fisheries resources.

Your prompt return of the completed questionnaire is important to the success of this study and will ensure that your name goes into the drawing for the prizes. Thank you for your assistance.

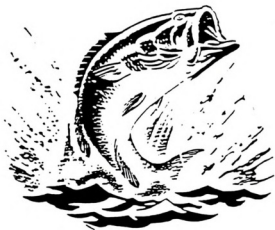
Sincerely,

Shari L. Dann
Shari L. Dann
Specialist
Fisheries & Wildlife
(517) 353-0675

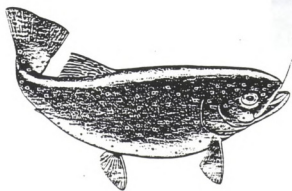
R. Ben Peyton
R. Ben Peyton
Professor
Fisheries & Wildlife
(517) 353-3236

TO FISH OR NOT TO FISH ...

A STUDY OF WHY SOME PEOPLE FISH AND OTHERS DON'T



YOUR
OPINIONS
WILL HELP
MANAGE
MICHIGAN'S
FISH
RESOURCES



A SURVEY BY:

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FISHERIES AND WILDLIFE

EAST LANSING, MICHIGAN

ABOUT THIS SURVEY

This survey has been sent to a small number of people who have recently purchased a Michigan fishing license. Your name was randomly selected from a list of licensees. **We desperately need your help and your response – whether or not you are an active angler!** We are trying to learn why people do or do not go fishing. We will share the results of this survey with the Michigan Department of Natural Resources Fisheries Division, which will then be better able to predict the demand for fishing and manage our fisheries resources.

Of course, your participation in this survey is voluntary. Your completion of this survey constitutes your willingness to participate in the study. Your name will be kept confidential, and will not be associated with the survey results.

INSTRUCTIONS FOR COMPLETING THIS SURVEY

Any person returning this survey promptly will be entered in a drawing for one of several prizes, including a Great Lakes Charter fishing trip. To be eligible, please write your name, address, and phone number on the tear-off sheet of the enclosed fluorescent-colored flyer. Return this tear-off sheet with your completed survey in the enclosed stamped envelope. It will be placed in a separate location from the survey until the time of the prize drawing. Winners will be notified early in 1993.

We greatly appreciate your participation in this study designed to help better plan for the future of our state's fisheries resources.

Shari L. Dann, Specialist
R. Ben Peyton, Professor

Dept. of Fisheries & Wildlife
Michigan State University
East Lansing MI 48824

SECTION 1: YOUR CURRENT FISHING PARTICIPATION AND INTEREST LEVEL

1. The following questions ask about how often you purchase a Michigan Resident Annual Fishing License or any one of the following Michigan licenses: Sportsman's License, Daily Fishing License, or Senior Resident Annual License.

- a. Please check the number of years that you have purchased any of the above fishing licenses during the past 5 year period:

0 0 YEARS 22.0% OR 2 YEARS 19.5% 3 OR 4 YEARS 58.5% YEARS

- b. Please check the number of years that you have gone fishing at least once a year during the past 5 year period:

0 0 YEARS 12.2% OR 2 YEARS 19.5% 3 OR 4 YEARS 68.3% 5 YEARS

If you haven't fished in the past 5 years, please skip to Question 5.

2. Please estimate the total number of days you spent fishing during each of the periods of the fishing season listed below. (Any part of a day counts as a whole day.)

I FISHED ABOUT $\bar{x}=8.3$ DAYS TOTAL IN WINTER 1991-1992 (About December 1, 1991 to March 31, 1992).

I FISHED ABOUT $\bar{x}=6.0$ DAYS TOTAL IN SPRING 1992 (About April 1 to May 30, 1992).

I FISHED ABOUT $\bar{x}=12.2$ DAYS TOTAL IN SUMMER 1992 (About June 1 to August 31, 1992.)

3. Please estimate the total number of days you will most likely go fishing during the fall 1992 period. (Any part of a day counts as a whole day.)

I WILL MOST LIKELY FISH ABOUT $\bar{x}=6.1$ DAYS TOTAL IN FALL 1992 (About September 1 to November 30, 1992).

4. In your most recent year of fishing, approximately what percentage (%) of your fishing was done with the following:

$\bar{x}=28.9$ % ONLY FRIENDS
 $\bar{x}=30.5$ % ONLY FAMILY
 $\bar{x}=29.0$ % BOTH FRIENDS AND FAMILY
 $\bar{x}=11.5$ % ALONE

100% (PERCENTAGES LISTED ABOVE SHOULD ADD TO 100%)

5. In license year 1993-94 (from April 1993 through March 1994) do you intend...

... to purchase a fishing license?

90.0% YES
5.0% NO
5.0% UNDECIDED

... to go fishing?

87.2% YES, DEFINITELY
7.7% PROBABLY
0 MAYBE
0 NO
 UNDECIDED

6. For you, how important is fishing compared with all other recreational activities you pursue?
 (Please check only one answer.)

Importance of fishing compared with other recreation

10.0% MY MOST IMPORTANT RECREATION ACTIVITY
35.0% MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
35.0% IMPORTANT, BUT MANY OTHER ACTIVITIES ARE MORE IMPORTANT
12.5% SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES ARE MORE IMPORTANT
5.0% ONLY SLIGHTLY IMPORTANT TO ME
2.5% IT IS NOT IMPORTANT TO ME

7. Are you interested in going fishing more often?

100.0% YES, I WISH I COULD GO FISHING MORE OFTEN [If yes, go on to next question.]

0 NO, I AM NOT INTERESTED IN FISHING MORE OFTEN [If no, skip to Question 9.]

8. How important are each of the following conditions in preventing you from going fishing more often? (Please circle one number for each condition below.)

	Not at all important		Important		Extremely important
NOT ENOUGH TIME DUE TO WORK COMMITMENTS	17.5%	12.5	22.5%	25.0	22.5%
NO ACCESS TO CONVENIENT FISHING SITES	30.0%	12.5	25.0%	15.0	17.5%
COST OF FISHING EQUIPMENT IS TOO HIGH	40.0%	32.5	22.5%	2.5	2.5%
I'M PHYSICALLY UNABLE TO PARTICIPATE IN FISHING	90.0%	7.5	0	0	2.5%
I DON'T HAVE OTHERS TO GO FISHING WITH	56.4%	25.6	12.8%	2.6	2.6%
FISHING REGULATIONS ARE TOO RESTRICTIVE	62.5%	20.0	10.0%	5.0	2.5%
BAD WEATHER OFTEN INTERFERES	38.5%	20.5	20.5%	10.3	10.3%
NOT ENOUGH TIME DUE TO FAMILY COMMITMENTS	20.0%	17.5	35.0%	15.0	12.5%
NO GOOD FISHING NEAR HOME	20.0%	10.0	22.5%	30.0	17.5%
COST OF LICENSES IS TOO HIGH	41.0%	15.4	30.8%	7.7	5.1%
I DON'T HAVE ENOUGH FISHING KNOWLEDGE OR SKILLS	67.5%	12.5	12.5%	7.5	0
FAMILY OR FRIENDS WOULD DISAPPROVE IF I INCREASED MY FISHING ACTIVITY	80.0%	10.0	7.5%	0	2.5%
FISHING REGULATIONS ARE TOO COMPLEX AND CONFUSING	72.5%	20.0	5.5%	2.5	0
CONCERN ABOUT FISH CONTAMINANTS, TOXICS OR POLLUTION	42.5%	7.5	30.0%	5.0	15.0%
NOT ENOUGH TIME DUE TO SCHOOL COMMITMENTS	60.0%	15.0	12.5%	10.0	2.5%
FISHING AREAS ARE TOO CROWDED	37.5%	17.5	37.5%	5.0	2.5%
COSTS OF TRANSPORTATION ARE TOO GREAT	57.5%	22.5	17.5%	0	2.5%
SOME FAMILY OR FRIENDS BELIEVE IT IS WRONG TO CATCH FISH FOR SPORT	97.5%	2.5	0	0	0
I DON'T THINK THERE'S ENOUGH FISH OF LEGAL SIZE	52.5%	17.5	17.5%	7.5	5.0%
NOT ENOUGH TIME DUE TO OTHER RECREATIONAL OR SOCIAL ACTIVITIES	32.5%	22.5	27.5%	15.0	2.5%
I LACK INFORMATION ABOUT WHERE TO GO FISHING	65.0%	12.5	5.0	12.5	5.0%
I DON'T HAVE FISHING EQUIPMENT	82.5%	12.5	5.0%	0	0
I RARELY CATCH THE SIZE AND/OR TYPE FISH I WANT TO	52.5%	12.5	15.0%	5.0	15.0%
OTHER:					
OTHER:					

[Please skip to Question 10.]

9. How would you rate the importance of each of the following as a reason why you are not interested in going fishing more often? (Please circle one number for each reason below.)

Reason for not fishing . . .	Not a reason		Important reason		Extremely Important
I'M MORE INTERESTED IN OTHER FORMS OF RECREATION AND/OR SOCIAL ACTIVITIES	1	2	3	4	5
I DON'T ENJOY FISHING THAT MUCH	1	2	3	4	5
I'M ALREADY A DEDICATED ANGLER AND I FISH QUITE OFTEN	1	2	3	4	5
I'M TOO INVOLVED IN MY WORK RIGHT NOW	1	2	3	4	5
I LACK INFORMATION ABOUT WHERE TO GO FISHING	1	2	3	4	5
I'M PHYSICALLY UNABLE TO PARTICIPATE IN FISHING	1	2	3	4	5
I'M TOO INVOLVED IN FAMILY OBLIGATIONS NOW	1	2	3	4	5
VERY LITTLE ABOUT FISHING APPEALS TO ME	1	2	3	4	5
I DON'T HAVE ENOUGH FISHING KNOWLEDGE OR SKILLS	1	2	3	4	5
I'M TOO BUSY WITH SCHOOL RIGHT NOW	1	2	3	4	5
THERE ARE CERTAIN ASPECTS OF FISHING I JUST DON'T LIKE. (Please specify: _____)	1	2	3	4	5
OTHER: _____	1	2	3	4	5
OTHER: _____	1	2	3	4	5

10. To what extent do you agree or disagree with the following statements about fishing? (Please circle one number for each statement below.)

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I USUALLY WATCH FISHING OR OUTDOOR SHOWS ON TELEVISION.	24.4%	43.9	12.2	7.3	12.2%
I FREQUENTLY VISIT STORES TO VIEW NEW EQUIPMENT RELATED TO MY INTEREST IN FISHING.	14.6%	34.1	24.4	24.4	2.4%
I FREQUENTLY READ ABOUT FISHING.	19.5%	36.6	14.6	22.0	7.3%
MOST OF MY FRIENDS ARE IN SOME WAY CONNECTED WITH FISHING.	24.4%	41.5	14.6	9.8	9.8%
I USUALLY SUBSCRIBE TO MAGAZINES RELATED TO FISHING.	14.6%	12.2	17.1	31.7	24.4%
FISHING SAYS A LOT ABOUT WHO I AM.	12.2%	19.5	34.1	19.5	14.5%
I OFTEN TALK TO MY FRIENDS ABOUT FISHING.	19.5%	31.7	24.4	17.1	7.3%
I SPEND A GREAT DEAL OF MONEY ON FISHING.	7.3%	17.1	29.3	36.6	9.8%
I FIND THAT A LOT OF MY LIFE IS ORGANIZED AROUND FISHING.	7.3%	19.5	9.8	36.6	26.8%
MY ENJOYMENT OF FISHING HAS INFLUENCED MY SELECTION OF WHERE I LIVE.	4.9%	9.8	14.6	36.6	34.1%
I MAINTAIN A MEMBERSHIP IN AN ORGANIZATION WHICH IS DIRECTLY RELATED TO FISHERIES OR FISHERY MANAGEMENT (E.G., MUCC, TROUT UNLIMITED, BASS ETC.).	4.9%	4.9	22.0	29.3	39.0%
MY ENJOYMENT OF FISHING HAS INFLUENCED MY CHOICE OF VACATION DESTINATIONS.	24.4%	36.6	12.2	12.2	14.6%
I OWN A RECREATIONAL PROPERTY PRIMARILY SO THAT I CAN BE CLOSE TO FISHING.	22.5%	0	12.5	22.5	42.5%

11. During the last year you fished, how would you rate the importance of each of these as a reason why you went fishing? (Please circle one number for each reason.)

Reason for fishing...	Not at all important		Important		Extremely important
TO BE ABLE TO HAVE A MEAL OF FISH	22.0%	26.8	39.0%	2.3	4.9%
TO EXPERIENCE A CHANGE IN DAILY ROUTINE	7.3%	12.2	36.6%	14.6	29.3%
TO HAVE FRIENDLY COMPETITION	36.6%	22.0	22.0%	12.2	7.3%
TO BE WITH FAMILY	24.4%	4.9	39.0%	17.1	14.6%
TO EXPERIENCE AND APPRECIATE A NATURAL SETTING	4.9%	9.8	19.5%	29.3	36.6%
TO BE WITH FRIENDS	7.3%	14.6	46.3%	17.1	14.6%
TO CATCH A "TROPHY-SIZED" FISH	31.7%	31.7	12.2%	9.8	14.6%
IT IS A TRADITION WITH ME	36.6%	9.8	31.7%	12.2	9.8%
TO HAVE FREEDOM TO DO AS I WANT	19.5%	14.6	34.1%	17.1	14.6%
TO SHOW MY CATCH TO OTHERS	56.1%	17.1	14.6%	9.8	2.4%
TO PLAY A STRONG FISH	22.0%	24.4	12.2%	19.5	22.0%
TO BE RESPECTED AS A CAPABLE ANGLER	39.0%	22.0	19.5%	14.6	4.9%
TO ESCAPE FROM STRESS, RELEASE TENSION OR RELAX	0	0	26.8%	17.1	56.1%
TO LEARN OR DISCOVER NEW THINGS	9.8%	14.6	36.6%	22.0	17.1%
TO TEACH OR SHARE MY SKILLS WITH OTHERS	19.5%	39.0	22.0%	9.8	9.8%
TO USE MY FISHING EQUIPMENT	17.1%	24.4	36.6%	12.2	9.8%
TO CHALLENGE MY KNOWLEDGE AND SKILLS	9.8%	17.1	46.3%	9.8	17.1%
TO GET AWAY OR HAVE A CHANGE OF SCENERY	0	4.9	24.4%	17.1	53.7%

SECTION II: YOU AND YOUR FAMILY'S FISHING BACKGROUND

This section asks you to recall some aspects of your fishing background during your youth (from birth through age 18). Please answer the questions in this section to the best of your memory.

12. Did anyone in your **immediate family** participate in fishing while you were growing up (prior to age 19)? Your immediate family includes your mother, father, brothers, sisters, or stepfamily members living in your household while growing up.

9.8% NO [Skip to Question 15.]
 90.2% YES [Please continue with next question.]

13. Please circle the number representing your parents' level of fishing activity while you were growing up. (If that parent was not present in your household, please circle "NP".)

Family member	Not present in my household	Did not fish	Occasionally fished over the years	Fished regularly over the years	Don't know their fishing frequency
MOTHER	0	29.3%	26.8%	31.7%	2.4%
STEPMOTHER	39.0%	4.9%	0	2.4%	0
FATHER	7.3%	2.4%	14.6%	63.4%	4.9%
STEPPFATHER	31.7%	4.9%	2.4%	9.8%	0

14. For your siblings (brothers, sisters, stepbrothers, stepsisters) present in your household while growing up, please fill in the table below showing how many siblings you had in each fishing activity level. (If you did not have siblings in a certain activity category, please fill in that block with a "0". Please place a number or a "0" in each block of the table below.)

In the example shown, there was 1 sister who did not fish and 1 who fished regularly.

Family member	Number of siblings who did not fish	Number of siblings who fished occasionally over the years	Number of siblings who fished regularly over the years	Number of siblings for whom fishing frequency is unknown
Example: (STEP)SISTER(S)	1	0	1	0
(STEP)SISTER(S)	$\bar{x} = .49$	$\bar{x} = .24$	$\bar{x} = .56$	$\bar{x} = .02$
(STEP)BROTHER(S)	$\bar{x} = .20$	$\bar{x} = .38$	$\bar{x} = 1.23$	$\bar{x} = 0$

15. Please check the **one** statement below which represents the level of your **extended family's** participation in fishing while you were growing up (prior to age 19). Your extended family includes your grandparents, stepgrandparents, aunts, uncles and cousins.

2.4% NO ONE IN MY EXTENDED FAMILY FISHED WHILE I WAS GROWING UP.
14.6% FEWER THAN HALF OF MY EXTENDED FAMILY MEMBERS FISHED.
22.0% AT LEAST HALF OF MY EXTENDED FAMILY MEMBERS FISHED.
39.0% MOST OF MY EXTENDED FAMILY MEMBERS FISHED.
14.6% EVERYONE IN MY EXTENDED FAMILY FISHED AT SOME TIME OR ANOTHER.
7.3% I DON'T KNOW HOW MANY OF MY EXTENDED FAMILY MEMBERS FISHED.

16. Did you have important people or groups of people while you were growing up who had a positive influence on your fishing interest or participation level today?

9.8% DON'T REMEMBER
29.3% NO SPECIFIC INDIVIDUAL OR GROUP REALLY INFLUENCED MY INTEREST IN FISHING
61.0% YES, I HAD INDIVIDUALS OR GROUPS OF PEOPLE WHO INFLUENCED MY INTEREST IN FISHING

If YES, please state the relationship of the 3 individuals or groups of people who had the most positive influence on your fishing interest. (For example, "neighbor down the street who took me fishing" or "my grandfather".)

17. Please circle YES or NO to show which of the activities you did as a youth (prior to age 19).

12.5%	YES	NO	Attend a fishing clinic, fishing derby, or other special fishing event
27.5%	YES	NO	Go fishing at a trout farm or other fee fishing facility
19.5%	YES	NO	Go fishing while on a school-related experience (e.g., 5th grade camp or field trip with your class)
85.4%	YES	NO	Do other water-related recreation activities (boating, swimming)
14.6%	YES	NO	Go fishing while you were at a summer youth camp
9.8%	YES	NO	Go fishing with a local youth organization or club (Scouts, 4-H, etc.)
85.4%	YES	NO	Go camping with your family
			If yes, did you go fishing while camping or on vacation with your family YES NO

18. In what type of an area did you spend most of your youth (prior to age 19)? *(Please check only one answer.)*

47.5% RURAL (FARM OR SMALL TOWN LESS THAN 10,000 PEOPLE)
30.0% SUBURBAN (OR SMALL CITY GREATER THAN 10,000 PEOPLE)
22.5% URBAN (CITY OF GREATER THAN 100,000 PEOPLE)

19. In what state did you spend most of your youth (prior to age 19): _____

SECTION III: YOUR FISHING PARTICIPATION HISTORY

The following set of questions asks about your very **earliest fishing experiences**. These experiences include the **time or set of times when you first went fishing**. Some people remember the very first fishing experience as a single event, while others remember their early fishing experiences as a general time in their lives. To the best of your ability, try to recall your earliest fishing experience or experiences and respond to the questions in this section.

20. About how old were you when you went fishing for the very first time?

APPROXIMATE AGE WHEN FIRST WENT FISHING = $\bar{x}=6.5$ YEARS OLD

21. How complete or accurate is your memory of your **very first fishing experience**? (Please check one answer below.)

29.3% I DON'T REMEMBER MY FIRST FISHING EXPERIENCE(S) AT ALL

[If you checked this answer, please skip to Question 23.]

41.5% I HAVE A VAGUE MEMORY OF MY FIRST FISHING EXPERIENCE(S).

29.3% I HAVE A FAIRLY COMPLETE AND ACCURATE MEMORY OF MY FIRST FISHING EXPERIENCE(S).

22. The following questions ask you to describe your **earliest fishing experiences**. Please complete any questions below that you are able to. If you cannot remember, please write "Don't remember" in the blank.

- a. Who did you go fishing with? (List any fishing companion(s) by listing their relationship to you, not their names.) _____
- b. What species of fish did you go fishing for? _____
- c. On what type(s) of body of water did you fish? (Check all that apply.)

<u>0</u> DON'T REMEMBER	<u>70.6%</u> INLAND LAKE
<u>58.8%</u> RIVER	<u>20.6%</u> STREAM
<u>8.8%</u> GREAT LAKES	<u>26.5%</u> POND

- d. From where did you fish? (Check all that apply.)

<u>2.9%</u> DON'T REMEMBER	<u>73.5%</u> FROM SHORE
<u>47.1%</u> FROM A DOCK OR PIER	<u>70.6%</u> FROM A BOAT
<u>2.9%</u> FROM A CHARTER BOAT	<u>8.8%</u> WHILE WADING
<u>26.5%</u> ON THE ICE	

e. What method(s) did you use for fishing? (Check all that apply.)

<u>2.4%</u> DON'T REMEMBER	<u>44.1%</u> CASTING
<u>32.4%</u> SPINCASTING	<u>82.4%</u> BAIT FISHING
<u>20.6%</u> TROLLING	<u>2.9%</u> FLY FISHING
<u>5.9%</u> SPEARING	<u>5.4%</u> DIPPING
<u>0</u> SNAGGING	

23. Was there a single event during your earliest fishing experiences which most influenced your fishing interest or participation level today?

61.0% No

39.0% YES

If yes, please describe this event briefly:

24. Please rate the extent to which you agree or disagree with the following statements about your satisfaction with your earliest fishing experiences. (Please circle one response for each statement.)

	Don't Remember	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I THOROUGHLY ENJOYED MY EARLIEST FISHING EXPERIENCES	7.3%	68.3%	17.1%	2.4%	0	4.9%
MY EARLIEST FISHING TRIPS WERE NOT AS ENJOYABLE AS I HAD EXPECTED	7.9%	0	5.3%	2.6%	47.4%	36.8%

25. Please rate the influence of your earliest fishing experiences on how interested you are in fishing today. (Please check only one answer.)

My earliest experiences...

51.2% DEFINITELY INFLUENCED MY LEVEL OF INTEREST IN FISHING TODAY.

36.6% SOMEWHAT INFLUENCED MY LEVEL INTEREST IN FISHING TODAY.

9.8% HAD LITTLE IMPACT ON MY LEVEL OF INTEREST IN FISHING TODAY.

2.4% DON'T REMEMBER

26. Please indicate whether any of the following events happened during your earliest fishing experiences. For each event that happened, please indicate what – if any – effect that event had on your interest in fishing. (Circle the most appropriate response for each event below.)

	DID IT HAPPEN?			HOW DID IT AFFECT YOUR FISHING INTEREST?		
	Yes	No	Don't Remember	Decreased my interest in fishing	No effect	Increased my interest in fishing
BEING INVOLVED IN PLANNING FISHING TRIP	41.5%	46.3%	12.2%	0	48.8%	34.1%
BEING AFRAID OF FISH OR WATER	4.9%	85.4%	9.8%	2.4%	78.0%	4.9%
ENJOYING THE OUTDOORS, WATER, WILDLIFE	92.7%	2.4%	4.9%	0	9.8%	85.4%
BEING BOTHERED BY INSECTS OR BAD WEATHER	41.5%	43.9%	14.6%	4.9%	82.9%	0
CASTING MY OWN LURES OR BAIT	78.0%	12.2%	9.8%	2.4%	31.7%	56.1%
HAVING TO FOLLOW RULES (E.G., KEEP QUIET)	58.5%	24.4%	17.1%	7.3%	75.6%	4.9%
CATCHING A BIG FISH	67.5%	17.5%	15.0%	2.4%	26.8%	68.3%
HANDLING FISH	82.9%	9.8%	7.3%	0	63.4%	31.7%
CATCHING LOTS OF FISH	67.5%	20.0%	12.5%	0	29.3%	63.4%
HAVING PROBLEMS WITH EQUIPMENT	63.4%	24.4%	12.2%	19.5%	63.4%	2.4%
EATING THE FISH I CAUGHT	87.8%	4.9%	7.3%	2.4%	39.0%	53.7%
CATCHING NO FISH	65.0%	22.5%	12.5%	17.1%	75.6%	0
HANDLING LURES OR BAIT	82.9%	7.3%	9.8%	2.4%	61.0%	31.7%
SEEING FISH DIE	82.5%	7.5%	10.0%	9.8%	87.8%	0
LANDING MY OWN FISH	90.2%	0	9.8%	0	26.8%	68.3%
OBSERVING OR PARTICIPATING IN FISH CLEANING	85.4%	7.3%	7.3%	9.8%	73.2%	12.2%

27. Please indicate the extent of your fishing activity at each stage of your youth. (Please circle one response for each age span.)

Age span	Don't remember	Did not fish at all	Tried fishing once or twice	Fished occasionally	Fished often	Fished frequently	Fished very frequently
BIRTH TO AGE 10	7.5%	2.5%	5.0%	35.0%	15.0%	25.0%	10.0%
AGE 11-18	0	0	2.5%	30.0%	15.0%	30.0%	22.5%

The following two questions ask about your childhood years, from birth to about age 10.

28. By the time you reached age 10, how important was fishing compared with all other recreational activities you did? (Please check only one answer.)

By age 10, fishing was...

- 5.0% MY MOST IMPORTANT RECREATION ACTIVITY
 17.5% MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
 37.5% IMPORTANT, BUT MANY OTHER ACTIVITIES WERE MORE IMPORTANT
 15.0% SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES WERE MORE IMPORTANT
 12.5% ONLY SLIGHTLY IMPORTANT TO ME
 12.5% NOT IMPORTANT TO ME

29. To what extent do you agree or disagree that the following statements described you during your childhood prior to age 11? (Please circle one number for each statement below.)

	Don't remember	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
MOST OF MY CHILDHOOD FRIENDS WERE IN SOME WAY CONNECTED WITH FISHING.	17.5%	10.0	27.5	15.0	20.0	10.0%
AS A CHILD, I WOULD USUALLY WATCH FISHING OR OUTDOOR SHOWS ON TV.	10.0%	7.5	25.0	22.5	22.5	12.5%
I WOULD OFTEN TALK WITH MY CHILDHOOD FRIENDS ABOUT FISHING.	5.0%	15.0	27.5	12.5	25.0	15.0%
AS A CHILD, I WOULD FREQUENTLY READ ABOUT FISHING.	5.0%	12.5	22.5	22.5	25.0	15.0%
AS A CHILD, I OFTEN VIEWED PICTURES OF FISHING OUTINGS.	12.5%	12.5	22.5	25.0	20.0	7.5%
AS A CHILD, I REQUESTED OR PURCHASED MY OWN FISHING EQUIPMENT.	5.0%	17.5	37.5	20.0	10.0	10.0%

The following four questions ask about your teen years, from about age 11 through age 18.

30. By the time you reached age 18, how important was fishing compared with all other recreational activities you did? *(Please check only one answer.)*

By was age 18, fishing was...

2.5% MY MOST IMPORTANT RECREATION ACTIVITY
25.0% MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
30.0% IMPORTANT, BUT MANY OTHER ACTIVITIES WERE MORE IMPORTANT
25.0% SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES WERE MORE IMPORTANT
12.5% ONLY SLIGHTLY IMPORTANT TO ME
5.0% NOT IMPORTANT TO ME

31. To what extent do you agree or disagree that the following statements described you during your teen years from age 11 through age 18? *(Please circle one number for each statement below.)*

	Don't remember	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
MOST OF MY TEENAGE FRIENDS WERE IN SOME WAY CONNECTED WITH FISHING.	5.0%	5.0	22.5	27.5	25.0	15.0%
AS A TEEN, I WOULD USUALLY WATCH FISHING OR OUTDOOR SHOWS ON TV.	2.5%	10.0	25.0	27.5	22.5	12.5%
I WOULD OFTEN TALK WITH MY TEENAGE FRIENDS ABOUT FISHING.	2.5%	5.0	37.5	27.5	20.0	7.5%
AS A TEEN, I WOULD FREQUENTLY READ ABOUT FISHING.	2.5%	10.0	37.5	22.5	20.0	7.5%
AS A TEEN, I OFTEN VIEWED PICTURES OF FISHING OUTINGS.	2.5%	7.5	30.0	30.0	25.0	5.0%
AS A TEEN, I REQUESTED OR PURCHASED MY OWN FISHING EQUIPMENT.	2.5%	22.5	45.0	15.0	10.0	5.0%

32. Was your fishing activity in your teen years (age 11 through age 18) higher, lower, or about the same as your activity in your childhood years (prior to age 11)? *(Please check only one answer.)*

55.0% HIGHER
27.5% LOWER
17.5% ABOUT THE SAME *(If you checked this answer, please skip to Question 34.)*

33. How important were the following factors in causing your fishing activity level to be higher or lower during your teen years (age 11 through age 18)? (Please circle one number for each factor.)

	Don't remember	Not a factor		Important factor		Extremely important
CHANGES IN THE FISHING ACTIVITY OF OTHER FAMILY MEMBERS	2.9%	26.5	17.6	29.4	11.8	11.8%
CHANGES IN MY FRIENDS' FISHING ACTIVITY LEVEL	2.9%	35.3	20.6	26.5	5.9	8.8%
CHANGES IN MY INTERESTS AND PREFERENCES AS A TEEN	2.9%	11.8	23.5	32.4	11.8	17.6%
CHANGES IN THE AMOUNT OR TYPE OF FISHING OPPORTUNITIES NEARBY	2.9%	32.4	14.7	23.5	17.6	8.8%
LESS TIME DUE TO MY WORK OBLIGATIONS	2.9%	26.5	20.6	20.6	26.5	2.9
LESS TIME DUE TO MY SCHOOL OBLIGATIONS	2.9%	14.7	17.6	32.4	20.6	11.8
LESS TIME DUE TO FAMILY COMMITMENTS	2.9%	11.8	32.4	38.2	11.8	2.9%
LESS TIME DUE TO OTHER RECREATIONAL OR SOCIAL ACTIVITIES AVAILABLE TO ME	2.9%	14.7	17.6	23.5	26.5	14.7%
I GAINED ACCESS TO TRANSPORTATION (CAR)	2.9%	14.7	8.8	35.3	14.7	23.5%
I GAINED MORE FREEDOM TO DO WHAT I WANTED	2.9%	8.8	11.8	32.4	23.5	20.6%

SECTION IV: GENERAL INFORMATION

34. What is your gender (sex)? 82.5% MALE 17.5% FEMALE
35. What is your age? YEARS OF AGE = $\bar{x}=55$
36. At any time during your youth (prior to age 19), did you live with only one parent?
22.5% YES 77.5% NO
- a. IF YES, approximately how many years did you spend in a single-parent household?
 # OF YEARS = $\bar{x}=7$
- b. IF YES, who was the head-of-household in your single-parent family?
0 MALE 100% FEMALE

37. What is the highest grade you have completed in school? (Please circle this grade.)

ELEMENTARY SCHOOL	10.0%1	2	3	4	5	6	7	8
HIGH/VOCATIONAL SCHOOL	37.5%9	10	11	12				
COLLEGE/TECHNICAL SCHOOL	15.0%3	14	15	16				
GRADUATE/PROFESSIONAL SCHOOL	5.0%7	18	19	20	21	22		
Some college	32.0%							

38. In what type of an area do you currently reside? (PLEASE CHECK ONE.)

37.5% RURAL (FARM OR SMALL TOWN LESS THAN 10,000 PEOPLE)
 32.3% SUBURBAN (OR SMALL CITY GREATER THAN 10,000 PEOPLE)
 30.0% URBAN (CITY OF GREATER THAN 100,000 PEOPLE)

39. Please indicate if you or someone in your household makes a real effort to do any of the following activities on a regular basis, from time to time when convenient, or doesn't really bother about it. (Please circle one number for each activity.)

	Do on a regular basis	Do from time to time	Don't really bother about	Don't know
CONTACT A MANAGING AGENCY OR THE LEGISLATURE ABOUT AN ENVIRONMENTAL TOPIC	0	30.0%	65.0%	5.0%
SORT TRASH TO SEPARATE GARBAGE FROM RECYCLABLE MATERIAL	52.5%	25.0%	22.5%	0
AVOID BUYING PRODUCTS FROM COMPANIES WHICH YOU DO NOT FEEL ARE ENVIRONMENTALLY RESPONSIBLE	10.0%	52.5%	32.5%	5.0%
CUT DOWN ON THE USE OF AUTOMOBILE BY USING PUBLIC TRANSPORTATION, CARPOOLING, ETC.	7.5%	10.0%	82.5%	0
CONTRIBUTE MONEY TO ENVIRONMENTAL ORGANIZATIONS	17.3%	30.0%	52.5%	0
WRITE LETTERS TO POLITICIANS EXPRESSING OPINIONS ON ENVIRONMENTAL ISSUES	2.5%	15.0%	82.5%	0
VOLUNTEER FOR A LITTER OR BEACH "CLEAN-UP" PROJECT, OR OTHER SUCH ACTIVITY	7.5%	22.5%	65.0%	5.0%
INITIATE OR TAKE PART IN A LEGAL EFFORT TO PROTECT THE ENVIRONMENT	2.5%	17.5%	80.0%	0
VOLUNTEER ON A HABITAT IMPROVEMENT PROJECT (SUCH AS A STREAM IMPROVEMENT PROJECT)	5.0%	22.5%	72.5%	0
MAINTAIN MEMBERSHIP IN A GENERAL ENVIRONMENTAL ORGANIZATION	17.5%	7.5%	72.5%	2.5%

PLEASE CONTINUE ON BACK OF THIS PAGE.

THANK YOU VERY MUCH FOR COMPLETING THIS SURVEY. We appreciate your willingness to provide this information. Results of this survey will be provided to the Michigan Department of Natural Resources Fisheries Division to assist in managing for the future demand for fishing.

Do you have any comments about fishing, your early experiences, or about fisheries you would like to share? We welcome any further comments below:

PLEASE RETURN THIS SURVEY (IN THE STAMPED ENVELOPE PROVIDED) TO:

**Shari L. Dann, Specialist
Department of Fisheries & Wildlife
Michigan State University
Natural Resources Building
East Lansing, Michigan 48824**

Phone: (517) 353-0675

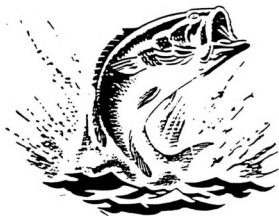
APPENDIX IV

Mailing contents for full angler survey (questionnaire, cover letters, and incentive prize flyer).

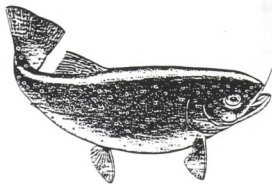


TO FISH OR NOT TO FISH ...

A STUDY OF WHY SOME PEOPLE FISH AND OTHERS DON'T



YOUR
OPINIONS
WILL HELP
MANAGE
MICHIGAN'S
FISH
RESOURCES



A SURVEY BY:

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FISHERIES AND WILDLIFE

EAST LANSING, MICHIGAN

ABOUT THIS SURVEY

This survey has been sent to a small number of people who have recently purchased a Michigan fishing license. Your name was randomly selected from a list of licensees. **We desperately need your help and your response – whether or not you are an active angler!** We are trying to learn why people do or do not go fishing. We will share the results of this survey with the Michigan Department of Natural Resources Fisheries Division, which will then be better able to predict the demand for fishing and manage our fisheries resources.

Of course, your participation in this survey is voluntary. Your completion of this survey constitutes your willingness to participate in the study. Your name will be kept confidential, and will not be associated with the survey results.

INSTRUCTIONS FOR COMPLETING THIS SURVEY

Any person returning this survey promptly will be entered in a drawing for one of several prizes, including a Great Lakes Charter fishing trip. To be eligible, please write your name, address, and phone number on the tear-off sheet of the enclosed fluorescent-colored flyer. Return this tear-off sheet with your completed survey in the enclosed stamped envelope. It will be placed in a separate location from the survey until the time of the prize drawing. Winners will be notified early in 1993.

We greatly appreciate your participation in this study designed to help better plan for the future of our state's fisheries resources.

Shari L. Dann, Specialist
R. Ben Peyton, Professor

Dept. of Fisheries & Wildlife
Michigan State University
East Lansing MI 48824

SECTION I: YOUR CURRENT FISHING PARTICIPATION AND INTEREST LEVEL

1. The following questions ask about how often you purchase a Michigan Resident Annual Fishing License or any one of the following Michigan licenses: Sportsperson's License, Daily Fishing License, or Senior Resident Annual License.

- a. Please check the number of years that you have purchased any of the above fishing licenses during the past 5 year period:

_____ 0 YEARS _____ 1 OR 2 YEARS _____ 3 OR 4 YEARS _____ 5 YEARS

- b. Please check the number of years that you have gone fishing at least once a year during the past 5 year period:

_____ 0 YEARS _____ 1 OR 2 YEARS _____ 3 OR 4 YEARS _____ 5 YEARS

If you haven't fished in the past 5 years, please skip to Question 5.

2. Please estimate the total number of days you spent fishing during each of the periods of the fishing season listed below. (Any part of a day counts as a whole day. If you did not fish in that period, please write "0" in the blank for that period.)

I FISHED ABOUT _____ DAYS TOTAL IN WINTER 1991-1992 (About December 1, 1991 to March 31, 1992).

I FISHED ABOUT _____ DAYS TOTAL IN SPRING 1992 (About April 1 to May 30, 1992).

I FISHED ABOUT _____ DAYS TOTAL IN SUMMER 1992 (About June 1 to August 31, 1992.)

3. Please estimate the total number of days you will most likely go fishing during the fall 1992 period. (Any part of a day counts as a whole day.)

I WILL MOST LIKELY FISH ABOUT _____ DAYS TOTAL IN FALL 1992 (About September 1 to November 30, 1992).

4. In your most recent year of fishing, approximately what percentage (%) of your fishing was done with the following:

_____ % ONLY FRIENDS
 _____ % ONLY FAMILY
 _____ % BOTH FRIENDS AND FAMILY
 _____ % ALONE

100% (PERCENTAGES LISTED ABOVE SHOULD ADD TO 100%)

5. In license year 1993-94 (from April 1993 through March 1994) do you intend...

... to purchase a fishing license?

☐ YES
☐ NO
☐ UNDECIDED

... to go fishing?

☐ YES, DEFINITELY
☐ PROBABLY
☐ MAYBE
☐ NO
☐ UNDECIDED

6. For you, how important is fishing compared with all other recreational activities you pursue?
(Please check only one answer.)

Importance of fishing compared with other recreation

☐ MY MOST IMPORTANT RECREATION ACTIVITY
☐ MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
☐ IMPORTANT, BUT MANY OTHER ACTIVITIES ARE MORE IMPORTANT
☐ SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES ARE MORE IMPORTANT
☐ ONLY SLIGHTLY IMPORTANT TO ME
☐ IT IS NOT IMPORTANT TO ME

7. Are you interested in going fishing more often?

☐ YES, I WISH I COULD GO FISHING MORE OFTEN *[If yes, go on to next question.]*

☐ NO, I AM NOT INTERESTED IN FISHING MORE OFTEN *[If no, skip to Question 9.]*

ANSWER ONLY IF YOU WISH YOU COULD GO FISHING MORE OFTEN

8. How important are each of the following conditions in preventing you from going fishing more often? (Please circle one number for each condition below.)

	Not at all important	1	2	3	4	Extremely important
NOT ENOUGH TIME DUE TO WORK COMMITMENTS	1	2	3	4	5	
NO ACCESS TO CONVENIENT FISHING SITES	1	2	3	4	5	
COST OF FISHING EQUIPMENT IS TOO HIGH	1	2	3	4	5	
I'M PHYSICALLY UNABLE TO PARTICIPATE IN FISHING	1	2	3	4	5	
I DON'T HAVE OTHERS TO GO FISHING WITH	1	2	3	4	5	
FISHING REGULATIONS ARE TOO RESTRICTIVE	1	2	3	4	5	
BAD WEATHER OFTEN INTERFERES	1	2	3	4	5	
NOT ENOUGH TIME DUE TO FAMILY COMMITMENTS	1	2	3	4	5	
NO GOOD FISHING NEAR HOME	1	2	3	4	5	
COST OF LICENSES IS TOO HIGH	1	2	3	4	5	
I DON'T HAVE ENOUGH FISHING KNOWLEDGE OR SKILLS	1	2	3	4	5	
FAMILY OR FRIENDS WOULD DISAPPROVE IF I INCREASED MY FISHING ACTIVITY	1	2	3	4	5	
FISHING REGULATIONS ARE TOO COMPLEX AND CONFUSING	1	2	3	4	5	
CONCERN ABOUT FISH CONTAMINANTS, TOXICS OR POLLUTION	1	2	3	4	5	
NOT ENOUGH TIME DUE TO SCHOOL COMMITMENTS	1	2	3	4	5	
FISHING AREAS ARE TOO CROWDED	1	2	3	4	5	
COSTS OF TRANSPORTATION ARE TOO GREAT	1	2	3	4	5	
SOME FAMILY OR FRIENDS BELIEVE IT IS WRONG TO CATCH FISH FOR SPORT	1	2	3	4	5	
I DON'T THINK THERE'S ENOUGH FISH OF LEGAL SIZE	1	2	3	4	5	
NOT ENOUGH TIME DUE TO OTHER RECREATIONAL OR SOCIAL ACTIVITIES	1	2	3	4	5	
I LACK INFORMATION ABOUT WHERE TO GO FISHING	1	2	3	4	5	
I DON'T HAVE FISHING EQUIPMENT	1	2	3	4	5	
I RARELY CATCH THE SIZE AND/OR TYPE FISH I WANT TO	1	2	3	4	5	

[PLEASE SKIP TO QUESTION 10.]

ANSWER ONLY IF YOU ARE NOT INTERESTED IN GOING FISHING MORE OFTEN

9. How would you rate the importance of each of the following as a reason why you are not interested in going fishing more often? (Please circle one number for each reason below.)

Reason for not fishing . . .	Not a reason		Important reason		Extremely Important
I'M MORE INTERESTED IN OTHER FORMS OF RECREATION AND/OR SOCIAL ACTIVITIES	1	2	3	4	5
I DON'T ENJOY FISHING THAT MUCH	1	2	3	4	5
I'M ALREADY A DEDICATED ANGLER AND I FISH QUITE OFTEN	1	2	3	4	5
I'M TOO INVOLVED IN MY WORK RIGHT NOW	1	2	3	4	5
I LACK INFORMATION ABOUT WHERE TO GO FISHING	1	2	3	4	5
I'M PHYSICALLY UNABLE TO PARTICIPATE IN FISHING	1	2	3	4	5
I'M TOO INVOLVED IN FAMILY OBLIGATIONS NOW	1	2	3	4	5
VERY LITTLE ABOUT FISHING APPEALS TO ME	1	2	3	4	5
I DON'T HAVE ENOUGH FISHING KNOWLEDGE OR SKILLS	1	2	3	4	5
I'M TOO BUSY WITH SCHOOL RIGHT NOW	1	2	3	4	5
THERE ARE CERTAIN ASPECTS OF FISHING I JUST DON'T LIKE. (Please specify: _____)	1	2	3	4	5

10. To what extent do you agree or disagree that the following statements describe your involvement in fishing? *(Please circle one number for each statement below.)*

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I FREQUENTLY WATCH FISHING OR OUTDOOR SHOWS ON TELEVISION.	1	2	3	4	5
I FREQUENTLY VISIT STORES TO VIEW NEW EQUIPMENT RELATED TO MY INTEREST IN FISHING.	1	2	3	4	5
I FREQUENTLY READ ABOUT FISHING.	1	2	3	4	5
FISHING SAYS A LOT ABOUT WHO I AM.	1	2	3	4	5
I OFTEN TALK TO MY FRIENDS ABOUT FISHING.	1	2	3	4	5
I SPEND A GREAT DEAL OF MONEY ON FISHING.	1	2	3	4	5
I FIND THAT A LOT OF MY LIFE IS ORGANIZED AROUND FISHING.	1	2	3	4	5
MY ENJOYMENT OF FISHING HAS INFLUENCED MY SELECTION OF WHERE I LIVE.	1	2	3	4	5
I MAINTAIN A MEMBERSHIP IN AN ORGANIZATION WHICH IS DIRECTLY RELATED TO FISHERIES OR FISHERY MANAGEMENT (E.G., MUCC, TROUT UNLIMITED, BASS ETC.).	1	2	3	4	5
MY ENJOYMENT OF FISHING HAS INFLUENCED MY CHOICE OF VACATION DESTINATIONS.	1	2	3	4	5
I OWN A RECREATIONAL PROPERTY PRIMARILY SO THAT I CAN BE CLOSE TO FISHING.	1	2	3	4	5

11. During the last year you fished, how would you rate the importance of each of these as a reason why you went fishing? *(Please circle one number for each reason.)*

Reason for fishing. . .	Not at all important		Important		Extremely important
TO TRY TO CATCH A MEAL OF FISH	1	2	3	4	5
TO EXPERIENCE A CHANGE IN DAILY ROUTINE	1	2	3	4	5
TO HAVE FRIENDLY COMPETITION	1	2	3	4	5
TO GO ON A FAMILY OUTING	1	2	3	4	5
TO EXPERIENCE AND APPRECIATE A NATURAL SETTING	1	2	3	4	5
TO BE WITH FRIENDS	1	2	3	4	5
TO CATCH A "TROPHY-SIZED" FISH	1	2	3	4	5
IT IS A TRADITION WITH ME	1	2	3	4	5
TO HAVE FREEDOM TO DO AS I WANT	1	2	3	4	5
TO SHOW MY CATCH TO OTHERS	1	2	3	4	5
TO PLAY A STRONG FISH	1	2	3	4	5
TO BE RESPECTED AS A CAPABLE ANGLER	1	2	3	4	5
TO ESCAPE FROM STRESS, RELEASE TENSION OR RELAX	1	2	3	4	5
TO LEARN OR DISCOVER NEW THINGS	1	2	3	4	5
TO TEACH OR SHARE MY SKILLS WITH OTHERS	1	2	3	4	5
TO USE MY FISHING EQUIPMENT	1	2	3	4	5
TO CHALLENGE MY KNOWLEDGE AND SKILLS	1	2	3	4	5
TO GET AWAY OR HAVE A CHANGE OF SCENERY	1	2	3	4	5

SECTION II: YOU AND YOUR FAMILY'S FISHING BACKGROUND

This section asks you to recall some aspects of your fishing background during your youth (from birth through age 18). Please answer the questions in this section to the best of your memory.

12. Did anyone in your **immediate family** participate in fishing while you were growing up (prior to age 19)? Your immediate family includes your mother, father, brothers, sisters, or stepfamily members living in your household while growing up.

_____ No [Skip to Question 15 on next page.]
 _____ Yes [Please continue with next question.]

13. Please circle the answer representing your parents' level of fishing activity while you were growing up. (If that parent was not present in your household, please circle "NP".)

Family member	Not present in my household	Did not fish	Occasionally fished over the years	Fished regularly over the years	Don't know their fishing frequency
MOTHER	NP	0	1	2	DK
FATHER	NP	0	1	2	DK
STEPMOTHER	NP	0	1	2	DK
STEPFATHER	NP	0	1	2	DK

14. For your siblings (brothers, sisters, stepbrothers, stepsisters) present in your household while growing up, please fill in the table below showing how many siblings you had in each fishing activity level. (If you did not have siblings in a certain activity category, please fill in that block with a "0". Please place a number or a "0" in each block of the table below.)

In the example shown, there was 1 sister who did not fish and 1 who fished regularly.

Family member	Number of siblings who did not fish	Number of siblings who fished occasionally over the years	Number of siblings who fished regularly over the years	Number of siblings for whom fishing frequency is unknown
Example: SISTER(S)	1	0	1	0
SISTER(S) OR STEPSISTER(S)				
BROTHER(S) OR STEPBROTHER(S)				

15. Please check the **one** statement below which represents the level of your **extended family's** participation in fishing while you were growing up (prior to age 19). Your extended family includes your grandparents, stepgrandparents, aunts, uncles and cousins.

☐ NO ONE IN MY EXTENDED FAMILY FISHED WHILE I WAS GROWING UP.
☐ FEWER THAN HALF OF MY EXTENDED FAMILY MEMBERS FISHED.
☐ AT LEAST HALF OF MY EXTENDED FAMILY MEMBERS FISHED.
☐ MOST OF MY EXTENDED FAMILY MEMBERS FISHED.
☐ EVERYONE IN MY EXTENDED FAMILY FISHED AT SOME TIME OR ANOTHER.
☐ I DON'T KNOW HOW MANY OF MY EXTENDED FAMILY MEMBERS FISHED.

16. Did you have important people or groups of people while you were growing up who had a positive influence on your fishing interest or participation level today?

☐ DON'T REMEMBER
☐ NO SPECIFIC INDIVIDUAL OR GROUP REALLY INFLUENCED MY INTEREST IN FISHING
☐ YES, I HAD INDIVIDUALS OR GROUPS OF PEOPLE WHO INFLUENCED MY INTEREST IN FISHING
 If YES, please state the relationship of up to 3 individuals or groups of people who had the most positive influence on your fishing interest. (For example, "neighbor down the street who took me fishing" or "my grandfather".)

17. Please circle YES or NO to show which of the activities you did as a youth (prior to age 19).

YES	NO	Attend a fishing clinic, fishing derby, or other special fishing event
YES	NO	Go fishing at a trout farm or other fee fishing facility
YES	NO	Go fishing while on a school-related experience (e.g., 5th grade camp or field trip with your class)
YES	NO	Do other water-related recreation activities (boating, swimming)
YES	NO	Go fishing while you were at a summer youth camp
YES	NO	Go fishing with a local youth organization or club (Scouts, 4-H, etc.)
YES	NO	Go camping with your family
		If yes, did you go fishing while camping or on vacation with your family YES NO

18. In what type of an area did you spend most of your youth (prior to age 19)? (Please check only one answer.)

☐ RURAL - FARM
☐ RURAL - NONFARM, - AREA OF LESS THAN 2500 PEOPLE
☐ SMALL TOWN - AREA OF 2500 TO 50,000 PEOPLE
☐ URBANIZED AREA (CITY OR SUBURBAN AREA OF GREATER THAN 50,000 PEOPLE)

19. In what state did you spend most of your youth (prior to age 19): _____

SECTION III: YOUR FISHING PARTICIPATION HISTORY

The following set of questions asks about your very **earliest fishing experiences**. These experiences include the **time or set of times when you first went fishing**. Some people remember the very first fishing experience as a single event, while others remember their early fishing experiences as a general time in their lives. To the best of your ability, try to recall your earliest fishing experience or experiences and respond to the questions in this section.

20. About how old were you when you went fishing for the very first time?

APPROXIMATE AGE WHEN FIRST WENT FISHING = _____ YEARS OLD

21. How complete or accurate is your memory of your **very first fishing experience**? (Please check one answer below.)

_____ I DON'T REMEMBER MY FIRST FISHING EXPERIENCE(S) AT ALL.

[If you checked this answer, please skip to Question 23.]

_____ I HAVE A VAGUE MEMORY OF MY FIRST FISHING EXPERIENCE(S).

_____ I HAVE A FAIRLY COMPLETE AND ACCURATE MEMORY OF MY FIRST FISHING EXPERIENCE(S).

22. The following questions ask you to describe your **earliest fishing experiences**. Please complete any questions below that you are able to. If you cannot remember, please write "Don't remember" in the blank.

a. Who did you go fishing with? (List any fishing companion(s) by listing their relationship to you, not their names.) _____

b. What species of fish did you go fishing for? _____

c. On what type(s) of body of water did you fish? (Check all that apply.)

_____ DON'T REMEMBER

_____ RIVER

_____ GREAT LAKES

_____ INLAND LAKE

_____ STREAM

_____ POND

d. From where did you fish? (Check all that apply.)

_____ DON'T REMEMBER

_____ FROM A DOCK OR PIER

_____ FROM A CHARTER BOAT

_____ ON THE ICE

_____ FROM SHORE

_____ FROM A BOAT

_____ WHILE WADING

e. What method(s) did you use for fishing? (Check all that apply.)

☐ DON'T REMEMBER ☐ CASTING
☐ SPINCASTING ☐ BAIT FISHING
☐ TROLLING ☐ OTHER: _____

23. Was there a single event during your earliest fishing experiences which most influenced your fishing interest or participation level today?

☐ DON'T REMEMBER
☐ No
☐ YES If yes, please describe this event briefly:

24. Please rate the extent to which you agree or disagree with the following statements about your satisfaction with your earliest fishing experiences. (Please circle one response for each statement.)

	Don't Remember	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I THOROUGHLY ENJOYED MY EARLIEST FISHING EXPERIENCES	DR	1	2	3	4	5
MY EARLIEST FISHING TRIPS WERE NOT AS ENJOYABLE AS I HAD EXPECTED	DR	1	2	3	4	5

25. Please rate the influence of your earliest fishing experiences on how interested you are in fishing today. (Please check only one answer.)

My earliest experiences...

☐ DEFINITELY INFLUENCED MY LEVEL OF INTEREST IN FISHING TODAY.
☐ SOMEWHAT INFLUENCED MY LEVEL INTEREST IN FISHING TODAY.
☐ HAD LITTLE IMPACT ON MY LEVEL OF INTEREST IN FISHING TODAY.
☐ DON'T REMEMBER

26. Please indicate whether any of the following events happened during your earliest fishing experiences. For each event that happened, please indicate what – if any – effect that event had on your interest in fishing. (Circle the most appropriate response for each event below.)

	DID IT HAPPEN?			IF IT HAPPENED... HOW DID IT AFFECT YOUR FISHING INTEREST?		
	Don't remember	No	Yes	Decreased my interest in fishing	No effect	Increased my interest in fishing
BEING INVOLVED IN PLANNING FISHING TRIP	DR	N	Y →	1	2	3
BEING AFRAID OF FISH OR WATER	DR	N	Y →	1	2	3
ENJOYING THE OUTDOORS, WATER, WILDLIFE	DR	N	Y →	1	2	3
BEING BOTHERED BY INSECTS OR BAD WEATHER	DR	N	Y →	1	2	3
CASTING MY OWN LURES OR BAIT	DR	N	Y →	1	2	3
HAVING TO FOLLOW RULES (E.G., KEEP QUIET)	DR	N	Y →	1	2	3
CATCHING A BIG FISH	DR	N	Y →	1	2	3
HANDLING FISH	DR	N	Y →	1	2	3
CATCHING LOTS OF FISH	DR	N	Y →	1	2	3
HAVING PROBLEMS WITH EQUIPMENT	DR	N	Y →	1	2	3
EATING THE FISH I CAUGHT	DR	N	Y →	1	2	3
CATCHING NO FISH	DR	N	Y →	1	2	3
HANDLING LURES OR BAIT	DR	N	Y →	1	2	3
SEEING FISH DIE	DR	N	Y →	1	2	3
LANDING MY OWN FISH	DR	N	Y →	1	2	3
OBSERVING OR PARTICIPATING IN FISH CLEANING	DR	N	Y →	1	2	3

27. Please indicate the extent of your fishing activity as a youth. (Please circle one response for the following age spans: Birth to age 10 - prior to middle or junior high school
Age 11 - 18 - middle or junior high through high school years.)

Age span	Don't remember	Did not fish at all	Tried fishing once or twice	Fished occasionally	Fished often	Fished frequently	Fished very frequently
BIRTH TO AGE 10	DR	0	1	2	3	4	5
AGE 11-18	DR	0	1	2	3	4	5

The following two questions ask about your childhood years, from birth to about age 10 (before you entered middle school or junior high school).

28. By the time you reached age 10 (before you entered middle school or junior high school), how important was fishing compared with all other recreational activities you did? (Please check only one answer.)

By age 10, fishing was...

- ☐ MY MOST IMPORTANT RECREATION ACTIVITY
☐ MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
☐ IMPORTANT, BUT MANY OTHER ACTIVITIES WERE MORE IMPORTANT
☐ SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES WERE MORE IMPORTANT
☐ ONLY SLIGHTLY IMPORTANT TO ME
☐ NOT IMPORTANT TO ME

29. To what extent do you agree or disagree that the following statements described your involvement in fishing during your childhood prior to age 11 (before you entered middle school or high school)? (Please circle one number for each statement below.)

	Don't remember	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
AS A CHILD, I WOULD USUALLY WATCH FISHING OR OUTDOOR SHOWS ON TV.	DR	1	2	3	4	5
I WOULD OFTEN TALK WITH MY CHILDHOOD FRIENDS ABOUT FISHING.	DR	1	2	3	4	5
AS A CHILD, I WOULD FREQUENTLY READ ABOUT FISHING.	DR	1	2	3	4	5
AS A CHILD, I OFTEN VIEWED PICTURES OF FISHING CUTTINGS.	DR	1	2	3	4	5
AS A CHILD, I REQUESTED OR PURCHASED MY OWN FISHING EQUIPMENT.	DR	1	2	3	4	5

The following four questions ask about your teen years, from about age 11 through age 18 (from the time you entered middle or junior high school through your high school years).

30. By the time you reached age 18, how important was fishing compared with all other recreational activities you did? (Please check only one answer.)

By was age 18, fishing was...

- ☐ MY MOST IMPORTANT RECREATION ACTIVITY
☐ MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
☐ IMPORTANT, BUT MANY OTHER ACTIVITIES WERE MORE IMPORTANT
☐ SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES WERE MORE IMPORTANT
☐ ONLY SLIGHTLY IMPORTANT TO ME
☐ NOT IMPORTANT TO ME

31. To what extent do you agree or disagree that the following statements described your involvement in fishing during your teen years from age 11 through age 18? (Please circle one number for each statement below.)

	Don't remember	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
AS A TEEN, I WOULD USUALLY WATCH FISHING OR OUTDOOR SHOWS ON TV.	DR	1	2	3	4	5
I WOULD OFTEN TALK WITH MY TEENAGE FRIENDS ABOUT FISHING.	DR	1	2	3	4	5
AS A TEEN, I WOULD FREQUENTLY READ ABOUT FISHING.	DR	1	2	3	4	5
AS A TEEN, I OFTEN VIEWED PICTURES OF FISHING OUTINGS.	DR	1	2	3	4	5
AS A TEEN, I REQUESTED OR PURCHASED MY OWN FISHING EQUIPMENT.	DR	1	2	3	4	5

32. Was your fishing activity in your teen years (age 11 through age 18) higher, lower, or about the same as your activity in your childhood years (prior to age 11)? *(Please check only one answer.)*

☐ HIGHER

☐ LOWER

☐ ABOUT THE SAME *(If you checked this answer, please skip to Question 34.)*

33. How important were the following factors in causing your fishing activity level to be higher or lower during your teen years (age 11 through age 18)? *(Please circle one number for each factor.)*

	Don't remember	Very important in decreasing my fishing	Somewhat important in decreasing my fishing	Not a factor	Somewhat important in increasing my fishing	Very important in increasing my fishing
CHANGES IN THE FISHING ACTIVITY OF OTHER FAMILY MEMBERS	DR	1	2	3	4	5
CHANGES IN MY FRIENDS' FISHING ACTIVITY LEVEL	DR	1	2	3	4	5
CHANGES IN MY INTERESTS AND PREFERENCES	DR	1	2	3	4	5
CHANGES IN THE AMOUNT OR TYPE OF FISHING OPPORTUNITIES NEARBY	DR	1	2	3	4	5
CHANGES IN TIME AVAILABLE DUE TO MY WORK OBLIGATIONS	DR	1	2	3	4	5
CHANGES IN TIME AVAILABLE DUE TO MY SCHOOL OBLIGATIONS	DR	1	2	3	4	5
CHANGES IN TIME AVAILABLE DUE TO FAMILY COMMITMENTS	DR	1	2	3	4	5
CHANGES IN TIME AVAILABLE DUE TO OTHER RECREATIONAL OR SOCIAL ACTIVITIES	DR	1	2	3	4	5
I GAINED ACCESS TO TRANSPORTATION (CAR)	DR	1	2	3	4	5
I GAINED MORE FREEDOM TO DO WHAT I WANTED	DR	1	2	3	4	5

- PLEASE CONTINUE ON BACK OF THIS PAGE.**



40. Please indicate if you or someone in your household makes a real effort to do any of the following activities on a regular basis, from time to time when convenient, or doesn't really bother about it. (Please circle one number for each activity.)

	Do on a regular basis	Do from time to time	Don't really bother about	Don't know
CONTACT A MANAGING AGENCY OR THE LEGISLATURE ABOUT AN ENVIRONMENTAL TOPIC	1	2	3	DK
SORT TRASH TO SEPARATE GARBAGE FROM RECYCLABLE MATERIAL	1	2	3	DK
AVOID BUYING PRODUCTS FROM COMPANIES WHICH YOU DO NOT FEEL ARE ENVIRONMENTALLY RESPONSIBLE	1	2	3	DK
CUT DOWN ON THE USE OF AUTOMOBILE BY USING PUBLIC TRANSPORTATION, CARPOOLING, ETC.	1	2	3	DK
CONTRIBUTE MONEY TO ENVIRONMENTAL ORGANIZATIONS	1	2	3	DK
WRITE LETTERS TO POLITICIANS EXPRESSING OPINIONS ON ENVIRONMENTAL ISSUES	1	2	3	DK
VOLUNTEER FOR A LITTER OR BEACH "CLEAN-UP" PROJECT, OR OTHER SUCH ACTIVITY	1	2	3	DK
INITIATE OR TAKE PART IN A LEGAL EFFORT TO PROTECT THE ENVIRONMENT	1	2	3	DK
VOLUNTEER ON A HABITAT IMPROVEMENT PROJECT (SUCH AS A STREAM IMPROVEMENT PROJECT)	1	2	3	DK
MAINTAIN MEMBERSHIP IN A GENERAL ENVIRONMENTAL ORGANIZATION	1	2	3	DK

THANK YOU VERY MUCH FOR COMPLETING THIS SURVEY. We appreciate your willingness to provide this information. Results of this survey will be provided to the Michigan Department of Natural Resources Fisheries Division to assist in managing for the future demand for fishing. Do you have any other comments about your early fishing experiences you would like to share? We welcome any further comments below:

PLEASE RETURN THIS SURVEY (IN THE STAMPED ENVELOPE PROVIDED) TO:

Shari L. Dann, Specialist
 Department of Fisheries & Wildlife
 Michigan State University
 Natural Resources Building
 East Lansing, Michigan 48824

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FISHERIES AND WILDLIFE
NATURAL RESOURCES BUILDING
(517) 353-4477
FAX: 517-336-1699

EAST LANSING • MICHIGAN • 48824-1222

October 30, 1992

Dear Sir or Madam:

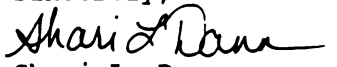
Enclosed is a survey we are sending to a small number of persons who have purchased a Michigan fishing license in the past. We need your help -- whether or not you consider yourself to be an active angler, since we are trying to learn why people do or do not go fishing. The results of our study will be used by the Michigan Department of Natural Resources to predict the demand for fishing and to manage our fisheries resources.

As a token of our appreciation, any person who completes and returns this survey will be entered in a drawing for one of several prizes (see enclosed flyer for more details). To be eligible, please return your survey and the tear-off sheet from the prize flyer in the enclosed envelope. Your name and entry into the drawing will be separated from the survey return. In this way, your name will be kept confidential and will not be associated with the survey results. If you have any questions about this survey, please do not hesitate to contact either of us.

Of course, your participation in this survey is voluntary. Your completion of the questionnaire constitutes your willingness to participate in the study. However, because we have only contacted a small sample of anglers in Michigan your response is very important.

Your prompt return of the completed questionnaire is important to the success of this study and will ensure that your name goes into the drawing for the prizes. Thank you for your assistance.

Sincerely,


Shari L. Dann
Specialist
Fisheries & Wildlife
(517) 353-0675



R. Ben Peyton
Professor
Fisheries & Wildlife
(517) 353-3236

November 17, 1992

Dear Sir or Madam:

You should be receiving soon a mail survey regarding your fishing participation. If you have already received and completed this survey, thank you for your assistance. If not, when you do receive this survey, please complete and return it as soon as possible.

When you return the completed survey and the prize entry form, we'll include you in a drawing for a Lake Michigan salmon charter trip, a Lake Michigan perch fishing trip, or \$100!

Thanks for your help!

Sincerely,

Shari L. Dann
Shari L. Dann
Specialist

R. Ben Peyton
R. Ben Peyton
Professor

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FISHERIES AND WILDLIFE
NATURAL RESOURCES BUILDING
(517) 353-4477
FAX: 517-336-1699

EAST LANSING • MICHIGAN • 48824-1222

December 1, 1992

Dear Sir or Madam:

Recently you received a questionnaire regarding your views about fishing in Michigan. We have not yet received your completed survey, so we are enclosing another copy.

This study is designed to learn why people do or do not go fishing. Fishing plays an important role in Michigan's tourism industry, and the results of this study will assist the Michigan Department of Natural Resources better understand future demands on fisheries resources. These types of surveys are an important way for Michigan citizens such as yourself to have some input into how our valuable natural resources are managed.

Your help is essential to this study - whether or not you consider yourself to be an active angler. Please take a few minutes NOW to complete and return the enclosed questionnaire!

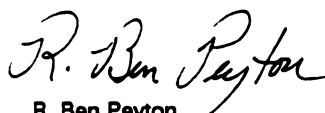
Remember, as a token of our appreciation, if you complete and return this survey you will be entered in a drawing for one of three prizes described on the enclosed flyer. To enter, please return your survey and the tear-off sheet from the flyer in the enclosed envelope. Your name will be kept separate from the questionnaire so that your responses will remain confidential. *However, unless you respond soon, your questionnaire will not reach us in time for you to be entered into the drawing.* Since we have only contacted a small number of Michigan anglers, you have a good chance of being one of the winners!

If you have any questions about this survey, please do not hesitate to contact either of us. Thank you for your assistance.

Sincerely,



Shari L. Dann
Specialist
Fisheries & Wildlife
(517) 353-0675



R. Ben Peyton
Professor
Fisheries & Wildlife
(517) 353-3236

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF FISHERIES AND WILDLIFE
NATURAL RESOURCES BUILDING
(517) 353-4477
FAX: 517-336-1699

EAST LANSING • MICHIGAN • 48824-1222

12/23/92

Dear Sir or Madam:

Recently you have received questionnaires regarding your views about fishing in Michigan. If you have already completed and returned this survey, thank you for your assistance. If not, please take about 20 minutes now to complete it.

We appreciate how busy you must be at this time of year, so, in recognition of the time required, we are increasing the prize offerings to persons completing and returning the survey. In addition to the Lake Michigan salmon charter trip and the Lake Michigan perch fishing trip, the cash prize has been increased from \$100 to \$200! In order to enter this drawing, however, your returned survey must be postmarked on or before January 8, 1993. Since we have only sampled a tiny fraction of anglers in Michigan, your chance of being drawn for one of the prizes is about 1 in 500 (a much better chance than in state lottery drawings).

But even more important than your chances of winning a prize, is your opportunity to have input into how our natural resources are managed in Michigan. The Department of Natural Resources has the responsibility to manage our environment in our best interests. Yet, even these professionals cannot manage effectively without information about the public they serve. Our role as researchers is to give them the necessary information—but we cannot without *your* help.

You may not understand why such information is needed and be reluctant to spend the time and effort to complete this survey. All we can say is, we are professionals who respect your privacy and the value of your time. We would not ask for this help if we did not have evidence that it was worthwhile.

Please return your survey and the tear-off sheet from the flyer which you received recently. Your name will be kept separate from the questionnaire so that your responses will remain confidential. If you have misplaced your copy of the survey or if you have any questions, please do not hesitate to call either of us. Please leave a message, and we will forward a copy of the survey as soon as possible. Thank you for your assistance.

Sincerely,



Shari L. Dann, Principal Investigator, (517) 353-0675



R. Ben Peyton, Professor, (517) 353-3236

PRIZES!

ANYONE COMPLETING AND RETURNING A SURVEY WILL BE ENTERED
IN A DRAWING FOR:

- **A Great Lakes Salmon Charter Fishing Trip**
With: Captain Denny Grinold on "Old Grin"
From: Grand Haven MI (Lake Michigan)
For: 1 to 4 people for 6 hours
Time (during the 1993 fishing season) and specific location to be arranged
between Captain and prize recipient
Donated by: Mr. Dennis Grinold, Fish 'N Grin Charters, (517) 321-2255

- **A GREAT LAKES PERCH CHARTER FISHING TRIP**
With: The Captain Nichols Fleet
From: South Haven MI (Lake Michigan)
For: 2 people
Time (during the 1993 fishing season) to be arranged between Captain and
prize recipient
Donated by: Mr. Don Nichols, Capt. Nichols Fleet, (616) 637-2507

- **ONE CASH PRIZE OF \$100**

TO BE ENTERED IN THE DRAWING:

1. Complete the enclosed survey.
2. Fill out the tear-off sheet below.
3. Return both the survey and the tear-off sheet as soon as possible in
the enclosed, stamped envelope to:

Shari L. Dann
Department of Fisheries & Wildlife
Natural Resources Building
Michigan State University
East Lansing MI 48824

**WINNERS WILL BE NOTIFIED IN EARLY 1993 --
BUT RETURN YOUR SURVEY TODAY!**

(Tear-off this portion and return in enclosed stamped envelope)

YOUR NAME: _____

YOUR MAILING ADDRESS: _____

YOUR PHONE NUMBER: _____

APPENDIX V

Non-respondent telephone survey.



MICHIGAN ANGLER RECRUITMENT STUDY
NON-RESPONDENT TELEPHONE FOLLOW-UP SURVEY

HELLO. My name is _____. I'm calling from Michigan State University, the Department of Fisheries and Wildlife. May I speak with _____?
[Repeat introduction when respondent comes to phone.]

[If not available] At what time could I call back to reach _____?

Last fall we sent you 2 copies of a long fisheries survey. Even though you didn't respond, it is very important that we ask you just a few of the questions on the survey. Your name will be kept confidential and separate from the answers you provide. Could you take about 5 minutes to answer some of those questions about fishing?

[If person is hesitant to respond, tell them the following: For this study, we are just as interested in talking with people who fish little or not at all, as we are with those who fish a lot. The information you provide in this study will help us better predict the future demand for fishing in the state and better manage our fisheries resources.]

1. Of the past 5 years, how many years have you gone fishing at least once? [Interviewer doesn't read categories; just check off answer.]

_____ 0 YEARS _____ 1 OR 2 YEARS _____ 3 OR 4 YEARS _____ 5 YEARS

2. During the past year in 1992, about how many days did you spend fishing? (*Count any part of a day as a whole day.*) [Interviewer just asks question and doesn't read categories, checks off category based on what respondent says.]

_____ days _____ 0 days
 _____ 1 to 8 days
 _____ 9 to 24 days
 _____ 25 to 49 days
 _____ 50 or more days

3. Now I will read some choices, and I would like you to tell me which best describes your plans to go fishing this year (from April 1993 through March 1994).

_____ YES, I WILL DEFINITELY GO FISHING SOMETIME IN THAT TIME PERIOD
 _____ I WILL PROBABLY GO FISHING...
 _____ MAYBE I WILL GO FISHING...
 _____ NO, I DEFINITELY WILL NOT GO FISHING...
 _____ I DON'T REALLY KNOW WHAT MY CHANCES ARE THAT I WILL GO FISHING...

4. Now I'm going to read a series of statements. Which statement describes how important fishing is to you compared with all other recreational activities you pursue? (*Please check only one answer.*)

Fishing is...
 _____ YOUR MOST IMPORTANT RECREATION ACTIVITY
 _____ MORE IMPORTANT THAN MOST OTHER RECREATION ACTIVITIES
 _____ IMPORTANT, BUT MANY OTHER ACTIVITIES ARE MORE IMPORTANT
 _____ SOMEWHAT IMPORTANT, BUT MOST OTHER ACTIVITIES ARE MORE IMPORTANT
 _____ ONLY SLIGHTLY IMPORTANT TO YOU
 _____ NOT IMPORTANT TO YOU

5. Are you interested in going fishing more often in the future than you have in the past? YES OR NO...? [Do not read responses.]

 YES
a. [If yes], Since you are interested, what prevents you from going fishing more often?

 NO
a. [If no] Why are you uninterested in going fishing more often?

6. Now I have a few questions about your immediate family and their fishing activity while you were growing up. Your immediate family includes your mother, father, brothers, sisters, or stepfamily members living in your household. Did anyone in your immediate family participate in fishing while you were growing up (prior to age 19)? YES or NO?

 No [Skip to Question 8.]
 Yes [Please continue with next question.]

7. These next questions are about your parents' level of fishing activity while you were growing up.

- a. Which parents were present in your household while you were growing up?

 Mother Father Stepmother Stepfather

- b. What was your 's fishing activity level while you were growing up? For each person, I will read several phrases, and you tell me which phrase best describes that person. [Repeat question for each parent present in respondent's household.]

<u>Mother</u>	<u>Father</u>	<u>Stepmother</u>	<u>Stepfather</u>
<u> </u> Did not fish	<u> </u> Did not fish	<u> </u> Did not fish	<u> </u> Did not fish
<u> </u> Fished occasionally	<u> </u> Fished occasionally	<u> </u> Fished occasionally	<u> </u> Fished occasionally
<u> </u> Fished regularly	<u> </u> Fished regularly	<u> </u> Fished regularly	<u> </u> Fished regularly
<u> </u> Don't know	<u> </u> Don't know	<u> </u> Don't know	<u> </u> Don't know

8. How would you describe the area where you spent most of your youth while growing up (prior to age 19)? (Please check only one answer.)

Was it...

 A RURAL, FARM AREA?
 A RURAL, NONFARM AREA OF LESS THAN 2500 PEOPLE?
 A SMALL TOWN AREA OF 2500 TO 50,000 PEOPLE?
 AN URBANIZED AREA, SUCH AS A CITY OR SUBURBAN AREA OF GREATER THAN 50,000 PEOPLE?

9. Did you spend most of your youth (prior to age 19) in Michigan or in another state?

 Michigan
 Another state ... Which state was that?

NEXT I HAVE A SERIES OF QUESTIONS ABOUT YOUR OWN EARLY FISHING BACKGROUND.

10. About how old were you when you went fishing for the very first time?

 years old Don't remember



11. Which of the following describes how much you fished in your **early childhood** from birth to age 10 (the time prior to middle or junior high school)?
Did you....
- ☐ Not fish at all
 - ☐ Try fishing once or twice
 - ☐ Fish occasionally
 - ☐ Fish often
 - ☐ Fish frequently
 - ☐ Fish very frequently
 - ☐ Don't remember
12. Was your fishing activity in your teen years (age 11 through 18) higher, lower, or about the same as your fishing activity in your childhood? (Check one answer.)
- ☐ Higher
 - ☐ About the same
 - ☐ Lower
13. I'm going to read a statement about your level of satisfaction with your **earliest** fishing experiences. Then I'll ask whether you agree or disagree with the statement. (*Please check one response.*)
- Statement: I THOROUGHLY ENJOYED MY EARLIEST FISHING EXPERIENCES.
- Do you....
- ☐ Strongly agree with this statement?
 - ☐ Agree with this statement?
 - ☐ Are you neutral?
 - ☐ Do you disagree with this statement, or
 - ☐ Do you strongly disagree with this statement?
 - ☐ Don't remember
14. How much did your earliest fishing experiences influence how interested you are in fishing today? (*Please check only one answer.*)
- Did your earliest experiences...
- ☐ DEFINITELY INFLUENCE YOUR LEVEL OF INTEREST IN FISHING TODAY?
 - ☐ SOMEWHAT INFLUENCE YOUR LEVEL OF INTEREST IN FISHING TODAY?
 - ☐ HAVE LITTLE IMPACT ON YOUR LEVEL OF INTEREST IN FISHING TODAY?
 - ☐ DON'T REMEMBER

I HAVE JUST A FEW SHORT QUESTIONS LEFT TO ASK YOU ...

15. [May skip this question if obvious.] What is your gender (sex)? ☐ MALE ☐ FEMALE
16. In what year were you born? 19 _____

17. What is the highest grade you have completed in school or at college? *[Don't read categories; just circle one grade.]*

ELEMENTARY SCHOOL	1	2	3	4	5	6	7	8
HIGH/VOCATIONAL SCHOOL	9	10	11	12				
COLLEGE/TECHNICAL SCHOOL	13	14	15	16				
GRADUATE/PROFESSIONAL SCHOOL	17	18	19	20	21	22		

18. How would you describe the area where you currently reside? *(Check one.)*
Is it....

☐ A RURAL, FARM AREA?
☐ A RURAL, NONFARM AREA OF LESS THAN 2500 PEOPLE?
☐ A SMALL TOWN AREA OF 2500 TO 50,000 PEOPLE?
☐ AN URBANIZED AREA, SUCH AS A CITY OR SUBURBAN AREA OF GREATER THAN 50,000 PEOPLE?

19. At any time during your youth (prior to age 19), did you live with only one parent?

☐ YES ☐ NO *[Skip to question 20.]*

- a. *[IF YES]* About how many years did you spend in a single-parent household?

OF YEARS = _____

- b. *[IF YES]* Who was the head-of-household in your single-parent family?

☐ MALE ☐ FEMALE

20. Finally, to help us with future studies, could you tell me why you didn't respond to the mail survey? *[Don't read categories; fill in answer, check one or more categories later.]*

☐ Not enough time; too busy
☐ Don't remember receiving it
☐ I don't fish very much/not interested in fishing
☐ I don't believe in filling out surveys
☐ Anti-DNR sentiment
☐ Other: _____
☐ Other: _____

21. *[Any other comments made by individual]:*

THANK YOU FOR YOUR HELP IN ANSWERING MY QUESTIONS. We appreciate the time you took.
Good night – or good bye.

APPENDIX VI

Non-respondent telephone survey results.

Table VI-1. Comparison of all respondents and all non-respondents in antecedents to fishing.

Fishing Antecedent Variable	Total Non- Respondents %	Total Respondents %	χ^2	d.f.	P
Residence As Youth					
Rural-Farm	30.9	23.3			
Rural-non-farm	10.3	13.2			
Small Town	35.1	29.3			
Suburb/City	23.7	34.2	6.77	3	.080
Lived in Michigan as Youth	86.6	83.7	0.57	1	.450
Sex					316
Male	81.4	83.1			
Female	18.6	16.9	0.18	1	.672
Single Parent Household As Child					
Yes	15.5	20.7			
No	84.5	79.3	1.52	1	.217
Age of First Fishing Experience ^c					
Years:					
Mean=	15.09 ^a	7.59 ^b			
Median=	7.0	6.0			
Standard Error=	2.31	.13	---	---	---

^a 95% C.I. = 10.50 - 19.68 years; ^b 95% C.I. = 7.34 - 7.84 years; ^c Mann-Whitney U test: z statistic = -2.77, p = .006 (**)

Table VI-2. Comparison of young respondents and young non-respondents (ages ≤ 23) in antecedents to fishing.

Fishing Antecedent Variable	Young Non- Respondents %	Young Respondents %	z	P
Residence as Youth				
Rural-Farm	10.3	25.5		
Rural-Non-farm	17.2	16.8		
Small Town	51.7	31.0	-0.91	.364
Suburb/City	20.7	26.6		
Lived in Michigan as Youth	100.0	95.7	-1.13	.258
Sex				
Male	96.6	85.5		
Female	3.4	14.5	-1.64	.100
Single Parent Household as Child				
Yes	17.2	29.0		
No	82.8	71.0	-1.32	.187
Age of First Fishing Experience Years:				
Mean=	14.66 ^a	6.01 ^b	-2.11	* .035
Median=	6	5		
Standard Error=	4.72	0.22		

^a 95% C.I. = 4.98 - 24.33 Years; ^b 95% C.I. = 5.57 - 6.45 Years



Table VI-3. Comparison of midage respondents and midage non-respondents (ages > 23) in antecedents to fishing.

Fishing Antecedent Variable	Midage Non- Respondents %	Midage Respondents %	z	P
Residence as Youth				
Rural-Farm	48.7	21.3		
Rural-Non-farm	7.7	13.4		
Small Town	25.6	29.8	- 3.35	*** <.001
Suburb/City	17.9	35.5		
Lived in Michigan as Youth	84.6	82.6	- 0.33	.742
Sex				
Male	82.1	80.0	- 0.31	.754
Female	17.9	20.0		
Single Parent Household as Child				
Yes	10.3	19.4		
No	89.7	80.6	- 1.42	.156
Age of First Fishing Experience Years:	Mean= Median= Standard Error=	14.90 ^a 8 3.58	- 1.61	.107

^a 95% C.I. = 7.65 - 22.15 Years; ^b 95% C.I. = 7.47 - 8.10 Years

Table VI-4. Comparison of daily license respondents and daily license non-respondents in antecedents to fishing.

Fishing Antecedent Variable	Daily Non- Respondents %	Daily Respondents %	z	P
Residence as Youth				
Rural-Farm	27.6	17.9		
Rural-Non-farm	6.9	10.4		
Small Town	31.0	23.6		
Suburb/City	34.5	48.1	- 1.28	.201
Lived in Michigan as Youth	75.9	86.0	- 1.31	.191
Sex				
Male	65.5	79.2		
Female	34.5	20.8	- 1.53	.125
Single Parent Household as Child				
Yes	20.7	16.0		
No	79.3	84.0		
Age of First Fishing Experience Years:				
Mean=	15.79 ^a	7.55 ^b	- 2.67	** .008
Median=	10	6		
Standard Error=	3.95	0.45		

^a 95% C.I. = 7.71 - 23.88 Years; ^b 95% C.I. = 6.65 - 8.43 Years

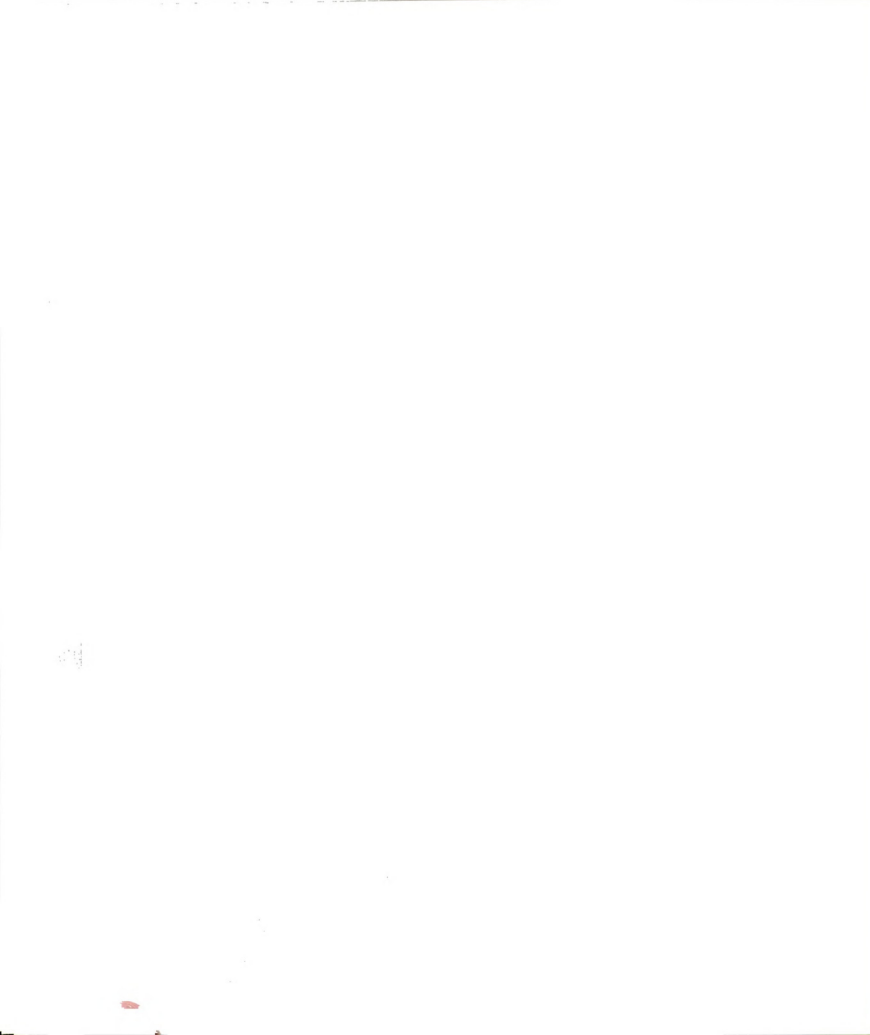


Table VI-5. Comparison of all respondents and all non-respondents in fishing socialization variables.

Fishing Socialization Variable	Total Non- Respondents %	Total Respondents %	χ^2	d.f.	P
Immediate Family Participation					
Yes	80.4	81.1			
No	19.6	18.9	.03	1	.873
Mother Fished	44.8	43.8	8.39	5	.136
Father Fished	75.0	73.0	14.99	5	** .010
Early Fishing Satisfaction					
Satisfied	79.4	82.8			
Neutral	12.4	8.1			
Dissatisfied	6.2	2.8			
Don't Remember	2.1	6.3	28.75	5	*** < .001
Influence of Early Experience					
Definitely	46.4	48.8			
Somewhat	26.8	29.6			
Little	26.8	17.3			
Don't Remember	0	4.3	9.00	3	* .029

Table VI-6. Comparison of young respondents and young non-respondents (ages ≤ 23) in fishing socialization variables.

Fishing Socialization Variable	Young Non- Respondents %	Young Respondents %	z	P
Immediate Family Participation				
Yes	86.2	90.7		
No	13.8	19.3	-.74	.458
Mother Fished	48.2	52.7	-.34	.736
Father Fished	86.2	83.1	-1.31	.191
Early Fishing Satisfaction				
Satisfied	86.2	78.4		
Neutral	3.4	12.2		
Dissatisfied	10.3	1.7		
Don't Remember	0	7.7	-1.24	.217
				321
Influence of Early Experience				
Definitely	48.3	43.3		
Somewhat	31.0	34.4		
Little	20.7	17.2		
Don't Remember	0	5.0	-.53	.595

Table VI-7. Comparison of midage respondents and midage non-respondents (ages > 23) in fishing socialization variables.

Fishing Socialization Variable	Midage Non- Respondents %	Midage Respondents %	z	P
Immediate Family Participation				
Yes	84.6	80.0		
No	15.4	20.0	-.71	.480
Mother Fished	48.7	42.8	-.34	.732
Father Fished	79.0	71.5	-.81	.420
Early Fishing Satisfaction				
Satisfied	84.6	83.2		
Neutral	10.3	7.7		
Dissatisfied	2.6	2.6		
Don't Remember	2.6	6.5	-1.36	.173
Influence of Early Experience				
Definitely	48.7	47.5		
Somewhat	35.9	30.3		
Little	15.4	18.3		
Don't Remember	0	3.9	-.58	.561

322

Table VI-8. Comparison of daily license respondents and daily license non-respondents in fishing socialization variables.

Fishing Socialization Variable		Daily Non- Respondents %	Daily Respondents %	z	P
Immediate Family Participation	Yes	69.0	75.2		
	No	31.0	24.8	-.68	.498
Mother Fished		35.7	40.5	-.56	.576
Father Fished		58.6	70.2	-1.11	.264
Early Fishing Satisfaction	Satisfied	65.5	81.7		
	Neutral	24.1	6.7		323
	Dissatisfied	6.9	6.7		
	Don't Remember	3.4	4.8	-1.27	.204
Influence of Early Experience	Definitely	41.4	47.5		
	Somewhat	10.3	27.7		
	Little	48.3	20.8		
	Don't Remember	0	4.0	-1.32	.186

Table VI-9. Comparison of all respondents and all non-respondents in youth fishing activity.

Youth Fishing Activity Variables	Total Non- Respondents %	Total Respondents %	χ^2	d.f.	P
Childhood Fishing Activity					
None	18.6	8.8			
Tried	4.1	6.1			
Occasional	38.1	38.5			
Often	22.7	21.0			
Frequent	7.2	12.2			
Very Frequent	8.2	7.1			
Don't Remember	1.0	6.3	16.10	6	* .013
Change in Fishing Activity in Teens					
Increase	45.4	47.5			
Same	28.9	31.9			
Decrease	25.8	20.6	1.50	2	.472

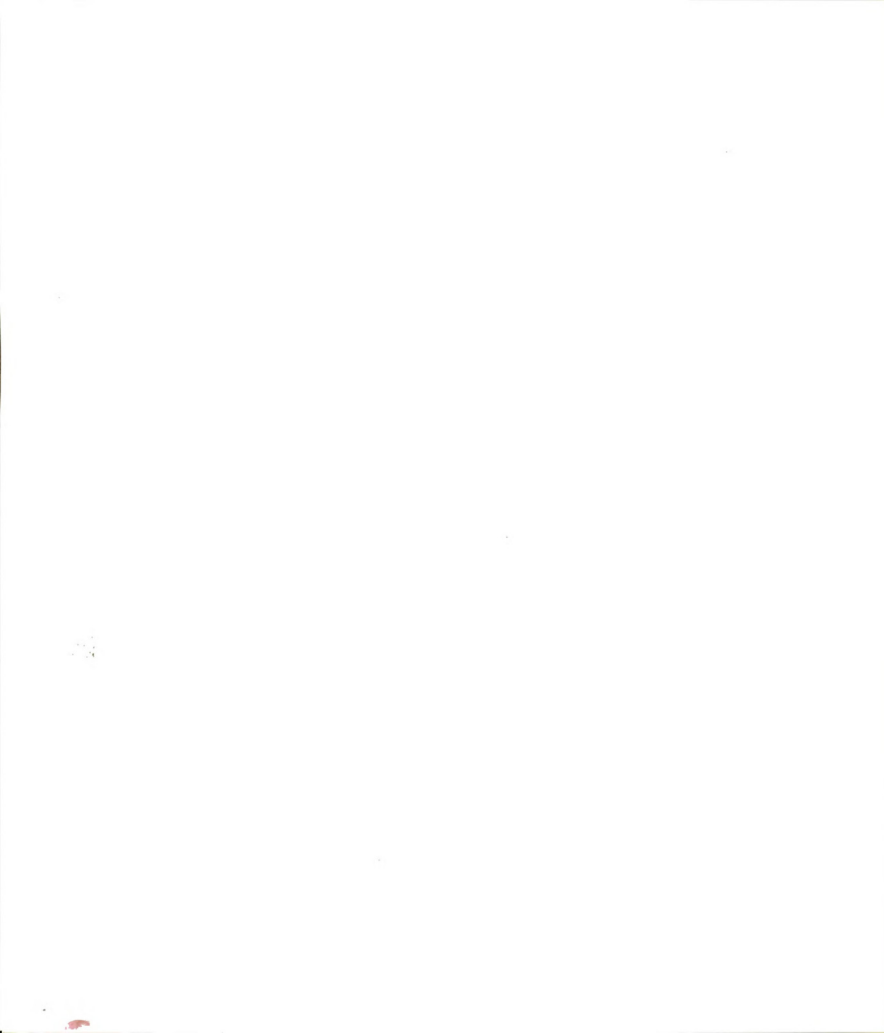


Table VI-10. Comparison of young respondents and young non-respondents (ages ≤ 23) in youth fishing activity.

Youth Fishing Activity Variables	Young Non- Respondents %	Young Respondents %	z	P
Childhood Fishing Activity				
None	0	5.5		
Tried	3.4	4.9		
Occasional	37.9	35.5		
Often	34.5	22.4		
Frequent	17.2	16.9		
Very Frequent	6.9	10.4		
Don't Remember	0	4.4	-.02	.984
Change in Fishing Activity in Teens				
Increase	51.7	57.1		
Same	27.6	16.3		
Decrease	20.7	26.6	-.42	.675

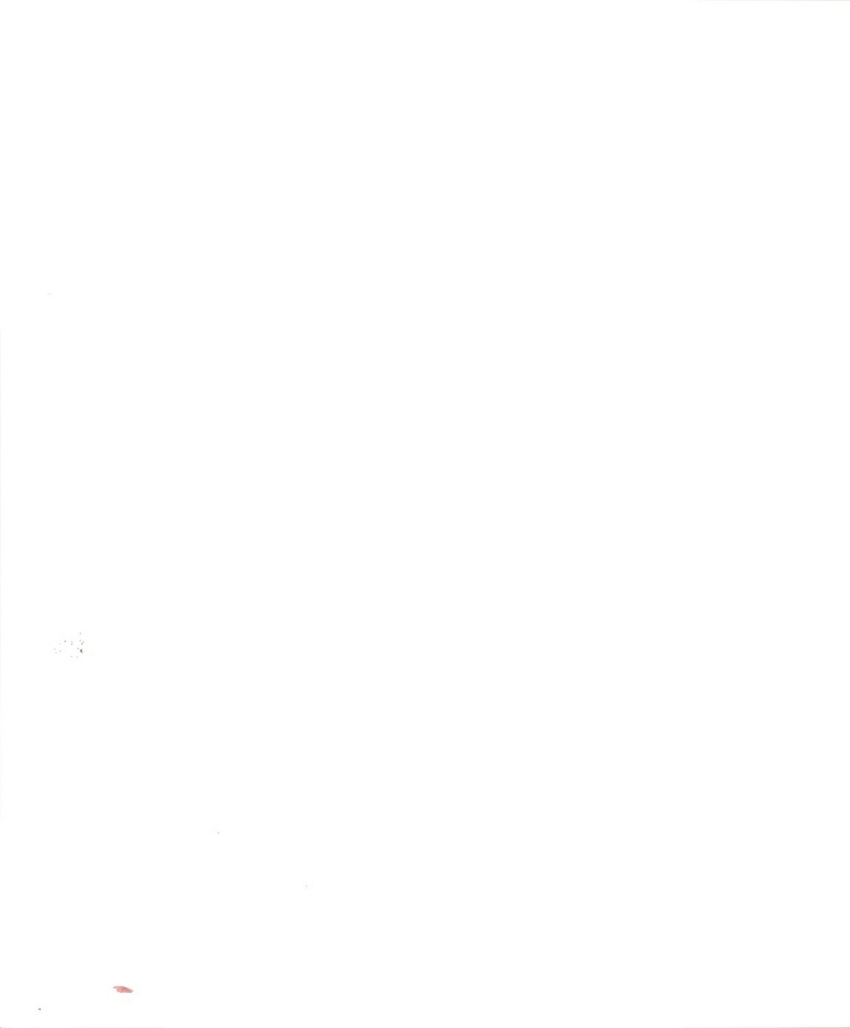


Table VI-11. Comparison of midage respondents and midage non-respondents (ages > 23) in youth fishing activity.

Youth Fishing Activity Variables	Midage Non- Respondents %	Midage Respondents %	z	P
Childhood Fishing Activity				
None	15.4	8.6		
Tried	2.6	7.3		
Occasional	51.3	39.3		
Often	17.9	20.5		
Frequent	5.1	10.9		
Very Frequent	7.7	6.7	- 1.74	.082
Don't Remember	0	6.6		
Change in Fishing Activity in Teens				
Increase	38.5	46.6		
Same	28.2	21.1		
Decrease	33.3	32.3	- .38	.705

Table VI-12. Comparison of daily license respondents and daily license non-respondents in youth fishing activity.

Youth Fishing Activity Variables	Daily Non- Respondents %	Daily Respondents %	z	P
Childhood Fishing Activity				
None	41.4	13.9		
Tried	6.9	3.0		
Occasional	20.7	46.5		
Often	17.2	15.8		
Frequent	0	9.9		
Very Frequent	10.3	6.9		
Don't Remember	3.4	4.0	- 2.14	* .032
Change in Fishing Activity in Teens				
Increase	48.3	38.1		
Same	31.0	28.6		
Decrease	20.7	33.3	- .72	.471

Table VI-13. Comparison of all respondents and all non-respondents in current fishing involvement.

Fishing Involvement Variable	Total Non- Respondents %	Total Respondents %	χ^2	d.f.	P
Consistency of Fishing Participation					
0 Years	6.2	0.9			
1-2 Years	17.5	12.4			
3-4 Years	11.3	19.2			
5 Years	64.9	67.4	24.40	3	*** < .001
Annual Total Days Fishing					
0 Days	18.6	5.7			
1-8 Days	45.4	19.7			
9-24 Days	19.6	25.3			
25-49 Days	9.3	23.7			
50 + Days	7.2	25.6	72.01	4	*** < .001
Fishing Intentions '93-'94					328
Yes, Definitely	54.6	82.0			
Probably	18.6	9.9			
Maybe	13.4	3.0			
No	8.2	1.2			
Don't Know	5.2	3.8	68.37	4	*** < .001
Fishing Importance					
Most Important	10.3	14.5			
More Important Than Most	11.3	29.8			
Important	27.8	31.6			
Somewhat Important	20.6	12.0			
Slightly Important	13.4	9.4			
Not Important	16.5	2.7	67.11	5	*** < .001
Fishing Interest					
Yes	71.3	90.8			
No	28.7	9.2	35.56	1	*** < .001

Table VI-14. Comparison of young respondents and young non-respondents (ages ≤ 23) in current fishing involvement.

Fishing Involvement Variable	Young Non- Respondents %	Young Respondents %	z	P
Consistency of Fishing Participation				
0 Years	3.4	0		
1-2 Years	3.4	11.8		
3-4 Years	6.9	18.2		
5 Years	86.2	70.1	-3.79	*** < .001
Annual Total Days Fishing:				
0 Days	3.4	6.8		
1-8 Days	37.9	13.6		
9-24 Days	24.1	22.7		
25-49 Days	17.2	20.5		
50 + Days	17.2	36.4	-2.44	* .015
Fishing Intentions '93-'94				329
Yes, Definitely	69.0	82.4		
Probably	24.1	10.4		
Maybe	3.4	2.2		
No	3.4	1.1		
Don't Know	0	3.8	-1.53	.126
Fishing Importance:				
Most Important	3.4	12.0		
More Important Than Most Important	24.1	28.3		
Somewhat Important	34.5	37.5		
Slightly Important	31.0	12.0		
Not Important	0	8.7		
	6.9	1.6	-1.74	.082
Fishing Interest:				
Yes	80.8	93.5		
No	19.2	6.5	-2.22	* .027

Table VI-15. Comparison of midage respondents and midage non-respondents (ages > 23) in current fishing involvement.

Fishing Involvement Variable	Midage Non- Respondents %	Midage Respondents %	Z	P
Consistency of Fishing Participation				
0 Years	0	0.7		
1-2 Years	10.3	7.3		
3-4 Years	17.9	17.8		
5 Years	71.8	74.2	-27	.790
Annual Total Days Fishing:				
0 Days	12.8	5.9		
1-8 Days	46.2	20.3		
9-24 Days	25.6	27.0		
25-49 Days	10.3	22.7		
50 + Days	5.1	24.1	-4.53	*** < .001
Fishing Intentions '93-'94				330
Yes, Definitely	66.7	83.9		
Probably	15.4	9.1		
Maybe	12.8	2.7		
No	0	1.1		
Don't Know	5.1	3.3	-2.82	** .005
Fishing Importance:				
Most Important	20.5	14.7		
More Important Than Most Important	10.3	31.0		
	35.9	31.4		
Somewhat Important	12.8	11.7		
Slightly Important	17.9	8.3		
Not Important	2.6	2.9	-1.43	.154
Fishing Interest:				
Yes	84.6	92.1		
No	15.4	7.9	-1.66	.098

Table VI-16. Comparison of daily license respondents and daily license non-respondents in current fishing involvement.

Fishing Involvement Variable	Daily License Non-Respondents %	Daily License Respondents %	z	P
Consistency of Fishing Participation				
0 Years	17.2	1.9		
1-2 Years	41.4	22.9		
3-4 Years	6.9	21.9		
5 Years	34.5	53.3	-2.22	* .027
Annual Total Days Fishing:				
0 Days	41.4	5.4		
1-8 Days	51.7	41.3		
9-24 Days	6.9	18.5		
25-49 Days	0	19.6		
50 + Days	0	15.2	-5.37	*** < .001
Fishing Intentions '93-'94				331
Yes, Definitely	24.1	62.6		
Probably	17.2	17.2		
Maybe	24.1	7.1		
No	24.1	2.0		
Don't Know	10.3	11.1	-3.74	*** < .001
Fishing Importance:				
Most Important	3.4	13.2		
More Important Than Most Important	0	15.1		
Somewhat Important	10.3	23.6		
Slightly Important	20.7	18.9		
Not Important	20.7	23.6		
	44.8	5.7	-4.64	*** < .001
Fishing Interest:				
Yes	44.8	84.0		
No	55.2	16.0	-4.33	*** < .001



Table VI-17. Comparison of all respondents and all non-respondents in sociodemographic characteristics.

Sociodemographic Variables	Total Non- Respondents %	Total Respondents %	χ^2	d.f. P
Highest Education Level				
Elementary School	2.1	2.8		
Some High School	5.2	7.8		
High School	35.1	34.4		
Some College/Tech	32.0	31.9		
4 Yrs. College	16.5	13.4		
Over 4 Yrs. College	9.3	9.7	1.71	5 .887
Residence				
Rural-Farm	20.6	18.6		
Rural-Nonfarm	8.2	14.8		
Small Town	32.0	32.2		
Suburb/City	39.2	34.4	3.52	3 .318
Age ^c Years:				
Mean=	36.68 ^a	42.08 ^b		
Median=	35	41		
Standard Error=	1.34	0.39	---	---

^a 95% C.I. = 34.02 - 39.34 years; ^b 95% C.I. = 41.33 - 42.84 years; ^c Mann-Whitney U test: z statistic = - 3.37, p < .001 (***)

Table VI-18. Comparison of young respondents and young non-respondents (ages ≤ 23) in sociodemographic characteristics.

Sociodemographic Variables		Young Non- Respondents %	Young Respondents %	z	P
Highest Education Level	Elementary School	3.4	1.6		
	Some High School	0	7.5		
	High School	31.0	31.6		
	Some College/Tech	55.2	43.9		
	4 Yrs. College	10.3	12.3		
	Over 4 Yrs. College	0	3.2	- 0.04	.966
Residence	Rural-Farm	10.3	18.9		
	Rural-Nonfarm	13.8	15.7		
	Small Town	37.9	33.5		
	Suburb/City	37.9	31.9	- 1.09	.276
333					
Age Years:	Mean=	23.07 ^a	24.44 ^b	- 1.21	.227
	Median=	22	22		
	Standard Error=	1.36	0.66		

^a 95% C.I. = 20.29 - 25.85 years; ^b 95% C.I. = 23.13 - 25.75 years

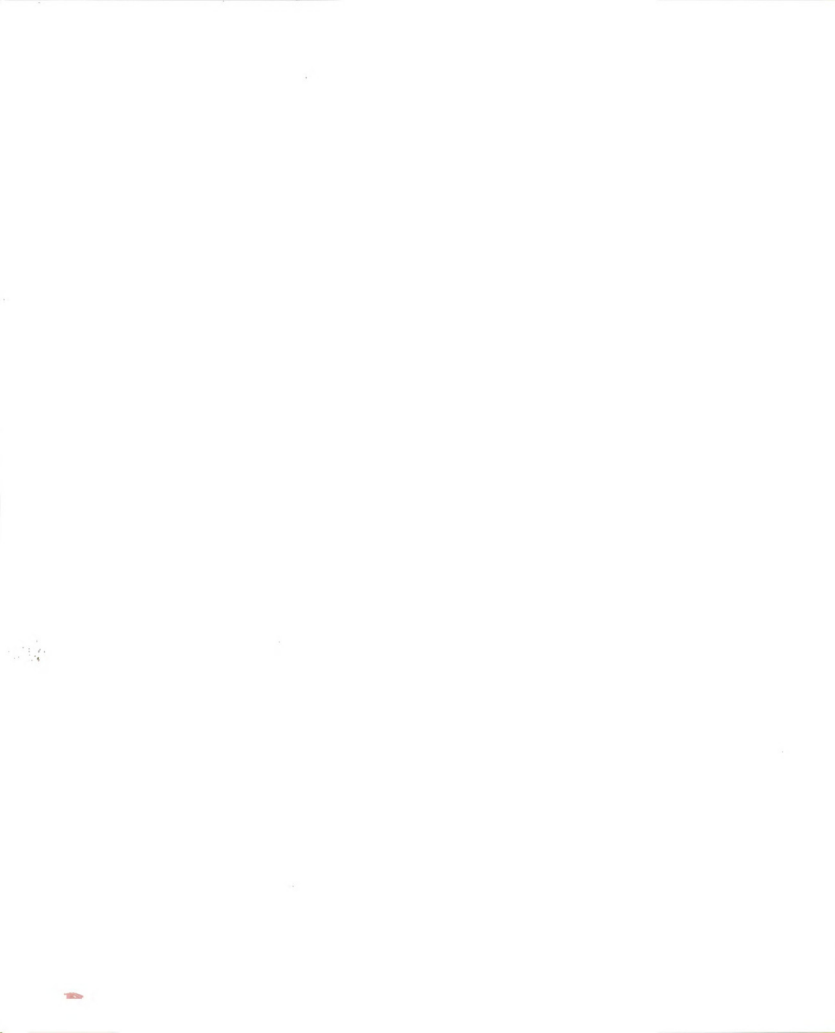


Table VI-19. Comparison of midage respondents and midage non-respondents (ages > 23) in sociodemographic characteristics.

Sociodemographic Variables		Midage Non- Respondents %	Midage Respondents %	z	P
Highest Education Level					
	Elementary School	0	1.9		
	Some High School	12.8	7.7		
	High School	43.6	35.4		
	Some College/Tech	25.6	30.6		
	4 Yrs. College	10.3	13.9		
	Over 4 Yrs. College	7.7	10.4	- 1.55	.120
Residence					
	Rural-Farm	38.5	18.0		
	Rural-Nonfarm	7.7	14.9		
	Small Town	25.6	32.5		
	Suburb/City	28.2	34.7	- 1.92	.055
Age					
Years:	Mean=	42.92 ^a	43.03 ^b	- 0.01	.989
	Median=	42	42		
	Standard Error=	1.62	0.36		

^a 95% C.I. = 39.64 - 46.21 years; ^b 95% C.I. = 42.31 - 43.74 years

Table VI-20. Comparison of daily license respondents and daily license non-respondents in sociodemographic characteristics.

Sociodemographic Variables	Daily License Non-Respondents %	Daily License Respondents %	Z	P
Highest Education Level				
Elementary School	3.4	0		
Some High School	0	6.5		
High School	27.6	33.6		
Some College/Tech	17.2	36.4		
4 Yrs. College	31.0	13.1		
Over 4 Yrs. College	20.7	10.3	- 2.23	* .026
Residence				
Rural-Farm	6.9	12.4		
Rural-Nonfarm	3.4	11.4		
Small Town	34.5	31.4		
Suburb/City	55.2	44.8	- 1.33	.183
Age Years:	Mean= Median= Standard Error=	41.90 ^a 43 2.13	- 0.81	.417

^a 95% C.I. = 37.53 - 46.26 years; ^b 95% C.I. = 37.57 - 42.40 years

APPENDIX VII

Additional results from full mail survey.

Table A-1. Satisfaction with earliest fishing experiences by sex of respondent.

Nature of Exposure Variable	Sex		χ^2	d.f.	p
	Male (%)	Female (%)			
Satisfaction rating for "I thoroughly enjoyed my earliest experiences"					
Agree	82.5	84.2			
Neutral	8.0	8.8			
Disagree	2.9	2.2			
Don't remember	6.5	4.8	1.64	5	.897
Satisfaction rating for "My earliest experiences were not as enjoyable as expected"					
Agree	7.6	5.7			
Neutral	10.5	12.5			
Disagree	74.3	75.5			
Don't remember	7.7	6.3	1.92	5	.861

Table A-2. Satisfaction with earliest fishing experiences by residence area during youth of respondents.

Nature of Exposure Variable	Residence Area As Youth					χ^2	d.f.	p
	Rural - farm (%)	Rural - nonfarm (%)	Small town (%)	Urban (%)				
Satisfaction rating for "I thoroughly enjoyed my earliest experiences"								
Agree	80.6	84.4	82.4	83.8				
Neutral	9.0	8.1	7.4	7.7				
Disagree	2.7	3.5	3.7	2.3				
Don't remember	7.7	4.0	6.6	6.3		7.24	15	.951
Satisfaction rating for "My earliest experiences were not as enjoyable as expected"								
Agree	9.6	5.8	6.1	6.5				
Neutral	12.1	9.0	9.7	11.8				
Disagree	68.7	77.4	76.6	75.2				
Don't remember	9.6	7.7	7.5	6.5		13.41	15	.570



Table A-3. Satisfaction with earliest fishing experiences by respondent family status/type while growing up.

Family status/type																	
Single-parent																	
"Traditional " two- parent (%)								Male- headed (%)	Female- headed (%)	χ^2	d.f.	p					
Nature of Exposure Variable																	
Satisfaction rating for "I thoroughly enjoyed my earliest experiences"																	
Agree												83.4	83.6	80.2			
Neutral												8.0	4.9	10.4			
Disagree												2.8	1.6	3.0			
Don't remember												5.8	9.8	6.4	6.92	10	.733
Satisfaction rating for "My earliest experiences were not as enjoyable as expected"																	
Agree												7.1	5.0	9.1			
Neutral												10.9	11.7	11.2			
Disagree												75.2	71.6	71.7			
Don't remember												6.8	11.7	8.0	10.24	10	.420

Table A-5. Influence of earliest fishing experiences on current fishing interest, by respondent family status/type during youth.

	Family status/type						
	Single-parent						
Exposure Agent Variable	"Traditional " two- parent (%)	Male- headed (%)	Female- headed (%)	χ^2	d.f.	p	
Did any single event during earliest experiences influence your fishing interest or participation today?							
Don't remember	29.2	31.1	31.4	.19	4	.922	
No	39.3	41.0	36.8				
Yes	31.5	27.9	31.9				
Degree to which earliest experiences influenced level of fishing interest today	48.5	47.5	49.3	7.07	6	.314	
Definitely	30.9	27.9	25.4				
Somewhat	17.0	21.3	18.5				
Little	3.6	3.3	6.8				
Don't remember							

Table B-1. Relationships between exposure agent variables and mean current importance of fishing.

Exposure Agent Variables	N	Mean current importance of fishing (c)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npar statistic	p
Did anyone in immediate family fish?									
No	254	4.14	.08	3.98 - 4.30					
Yes	1079	4.21	.04	4.14 - 4.29	.687	.407	.502	(a) -0.91	.362
Proportion of extended family who fished									
No one	139	4.14	.12	3.91 - 4.37					
Fewer than half	380	4.02	.07	3.89 - 4.15					
At least half	251	4.31	.07	4.17 - 4.46					
Most	244	4.26	.07	4.12 - 4.41					
Everyone	170	4.44	.10	4.25 - 4.62	4.32	** .002	* .027	(b) 15.93	** .003
Level of Mother's Fishing Activity									
Did not fish	653	4.14	.05	4.04 - 4.24					
Occasionally fished	356	4.21	.06	4.08 - 4.33					
Regularly fished	172	4.15	.10	3.95 - 4.34	.309	.735	.459	.42	.809
Level of Father's Fishing Activity									
Did not fish	300	4.12	.07	3.97 - 4.26					
Occasionally fished	331	4.06	.07	3.92 - 4.21					
Regularly fished	612	4.27	.05	4.18 - 4.37	3.48	* .031	.112	5.79	* .055

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test)

(c) Mean importance where 1=not at all important, 6=most important activity.

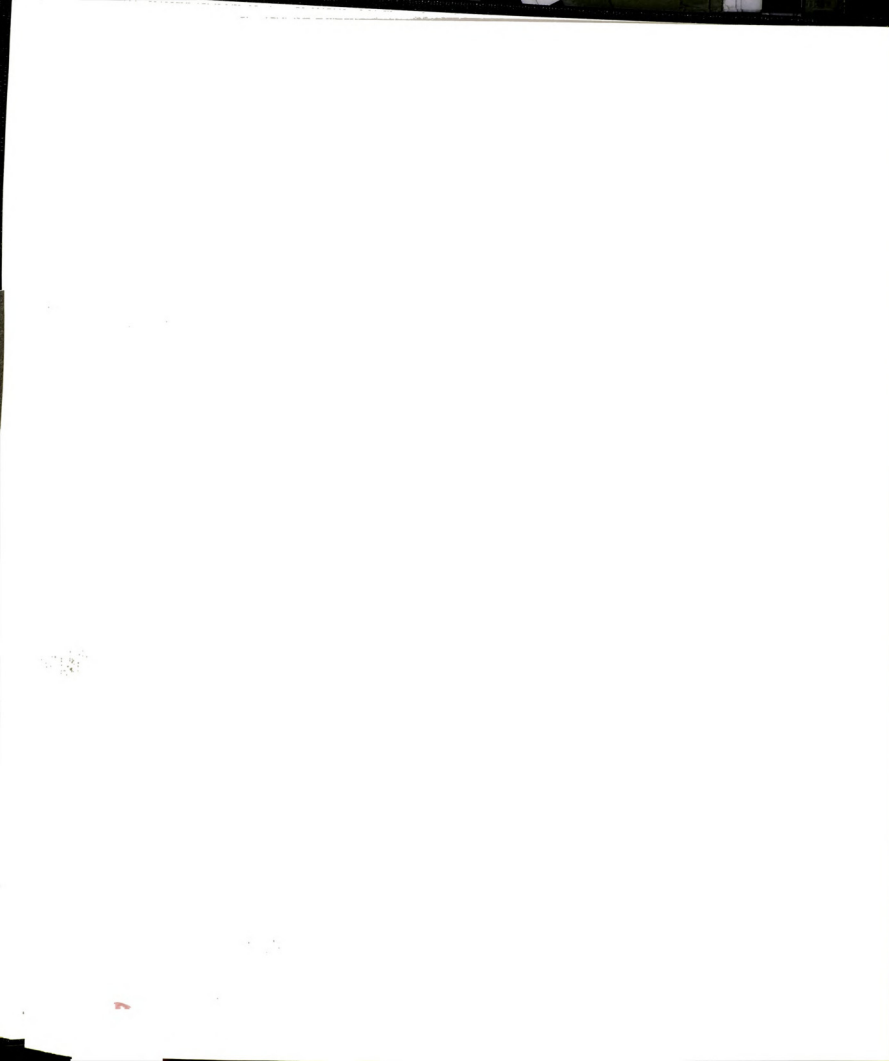


Table B-2. Relationships between exposure agent variables and mean total days fishing per year.

Exposure Agent Variables	N	Mean total days fishing per year	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	npair statistic	p
Did anyone in immediate family fish?									
No	229	29.05	2.16	24.79 - 33.31					
Yes	1011	37.61	1.25	35.15 - 40.07	9.14	** .003	*** <.001	(a) -2.96	** .003
Proportion of extended family who fished									
No one	124	29.28	2.87	23.61 - 34.95					
Fewer than half	351	28.64	1.68	25.33 - 31.96					
At least half	240	37.80	2.54	32.79 - 42.80					
Most	231	40.05	2.71	34.71 - 45.39					
Everyone	160	51.78	3.90	44.07 - 59.48	11.67	*** <.001	*** <.001	(b) 41.08	*** <.001
Level of Mother's Fishing Activity									
Did not fish	605	31.41	1.39	28.68 - 34.13					
Occasionally fished	332	37.36	2.09	33.25 - 41.48					
Regularly fished	160	40.59	3.71	33.26 - 47.91	5.15	** .006	*** <.001	(b) 6.89	* .032
Level of Father's Fishing Activity									
Did not fish	271	30.06	2.05	26.02 - 34.10					
Occasionally fished	311	33.50	2.18	29.20 - 37.79					
Regularly fished	578	39.01	1.69	35.70 - 42.32	5.52	** .004	** .014	(b) 12.99	** .002

(a) z statistic (Mann-Whitney U test)

(b) χ^2 (Kruskal-Wallis test)

Table B-3. Significant relationships between events during earliest fishing experiences and mean current importance of fishing.

Events That Happened During Earliest Fishing Experience(s)	N	Mean current importance of fishing (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Planned fishing trip: No	637	4.06	.05	3.96 - 4.16	14.75	*** <.001	* .015	-3.50	***<.001
Yes	459	4.35	.05	4.24 - 4.46					
Caught lots of fish: No	289	3.87	1.36	3.71 - 4.03	23.62	*** <.001	** .003	-4.35	***<.001
Yes	901	4.28	1.20	4.20 - 4.35					
Caught big fish: No	355	3.93	1.32	3.78 - 4.06	21.15	*** <.001	* .014	-4.20	***<.001
Yes	850	4.28	1.19	4.20 - 4.37					
Cleaned fish: No	148	3.97	.11	3.74 - 4.19	4.28	* .039	** .007	-1.97	* .048
Yes	1063	4.19	.04	4.11 - 4.27					
Handled fish: No	192	3.93	.10	3.74 - 4.13	9.35	** .002	** .006	-2.85	** .004
Yes	1004	4.23	.04	4.16 - 4.31					
Cast own lures, bait: No	170	3.74	.10	3.54 - 3.95	25.60	*** <.001	** .005	-4.74	***<.001
Yes	1027	4.26	.04	4.19 - 4.34					
Handled lures, bait: No	186	3.97	.10	3.78 - 4.17	5.82	** .016	.063	-2.41	* .016
Yes	1013	4.21	.04	4.14 - 4.29					
Ate fish caught: No	179	3.88	.10	3.68 - 4.08	11.93	*** <.001	** .013	-3.17	** .002
Yes	1044	4.22	.04	4.15 - 4.30					
Was afraid of fish or water: No	1096	4.22	.04	4.14 - 4.29	6.40	** .012	.479	-2.55	** .011
Yes	155	3.95	.10	3.75 - 4.15					
Had to follow rules (e.g., keep quiet): No	413	4.08	.06	3.96 - 4.21	4.15	* .042	.226	-2.05	* .040
Yes	742	4.23	.04	4.15 - 4.33					

(a) z statistic (Mann-Whitney U test)

(b) Mean importance where 1=not at all important, 6=most important activity.

Table B-4. Non-significant relationships between events during earliest fishing experiences and mean current importance of fishing.

Events That Happened During Earliest Fishing Experience(s)	N	Mean current importance of fishing (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Caught no fish: No	344	4.18	.07	4.04 - 4.31					
Yes	836	4.17	.04	4.08 - 4.25	.02	.878	.381	-.24	.814
Landed own fish: No	85	3.93	.16	3.62 - 4.24					
Yes	1126	4.20	.04	4.13 - 4.27	3.69	.055	***<.001	-1.65	.099
Had problems with equipment No	495	4.14	.06	4.02 - 4.25					
Yes	649	4.24	.05	4.15 - 4.33	1.96	.162	.129	-1.37	.170
Bothered by insects, bad weather. No	588	4.19	.05	4.09 - 4.30					
Yes	582	4.20	.05	4.10 - 4.30	.00	.959	.254	-.20	.839
Saw fish die: No	268	4.10	.08	3.95 - 4.26					
Yes	908	4.19	.04	4.11 - 4.27	.89	.345	.112	-.83	.408
Enjoyed outdoors, water, wildlife: No	33	4.12	.26	3.59 - 4.64					
Yes	1210	4.19	.04	4.12 - 4.26	.11	.745	***<.001	-.04	.968

(a) z statistic (Mann-Whitney U test)

(b) Mean importance where 1=not at all important, 6=most important activity.

Table B-5. Significant relationships between events during earliest fishing experiences and mean total days fishing per year.

Events That Happened During Earliest Fishing Experience(s)	N	Mean current total days fishing per year	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Planned fishing trip: No	588	31.80	1.47	28.91 - 34.70	16.10	*** <.001	*** <.001	-4.71	*** <.001
Yes	431	41.54	1.99	37.61 - 45.47					
Caught lots of fish: No	267	26.03	1.99	22.11 - 29.95	27.71	*** <.001	*** <.001	-5.84	*** <.001
Yes	843	38.48	1.37	35.80 - 41.16					
Caught big fish: No	331	27.08	1.82	23.50 - 30.65	23.38	*** <.001	*** <.001	-5.64	*** <.001
Yes	795	39.17	1.42	36.37 - 41.97					
Handled fish: No	172	29.84	2.60	24.71 - 34.97	4.36	* .037	** .002	-2.07	* .038
Yes	943	36.46	1.27	33.97 - 38.95					
Cast own lures, bait: No	152	29.25	3.03	23.25 - 35.25	5.06	* .025	.421	-3.24	*** <.001
Yes	967	36.81	1.24	34.37 - 39.25					
Ate fish caught: No	161	30.06	3.12	23.89 - 36.22	3.95	* .047	.422	-2.75	** .006
Yes	981	36.56	1.22	34.16 - 38.96					
Was afraid of fish or water: No	1022	36.13	1.19	33.79 - 38.46	2.17	.141	.856	-2.44	** .015
Yes	143	31.10	3.21	24.76 - 37.45					
Had to follow rules (e.g., keep quiet): No	387	32.25	1.83	28.65 - 35.84	4.32	* .038	* .020	-2.28	* .022
Yes	693	37.32	1.51	34.35 - 40.28					

(a) z statistic (Mann-Whitney U test)

Table B-6. Non-significant relationships between events during earliest fishing experiences and mean current total days fishing per year.

Events That Happened During Earliest Fishing Experience(s)	N	Mean current total days fishing per year	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Caught no fish: No	328	34.41	2.12	30.24 - 38.57					
Yes	778	35.97	1.38	33.26 - 38.67	.38	.537	.966	-.71	.479
Cleaned fish: No	131	32.81	3.59	25.72 - 39.90					
Yes	997	35.72	1.20	33.36 - 38.09	.67	.414	.071	-1.62	.106
Landed own fish: No	71	30.92	4.15	22.63 - 39.20					
Yes	1060	35.86	1.19	33.52 - 38.19	1.09	.296	* .015	-.94	.348
Handled lures, bait: No	167	37.47	2.90	25.62 - 37.07					
Yes	955	38.52	1.25	33.72 - 38.61	2.25	.134	.512	-1.75	.081
Had problems with equipment: No	460	35.27	1.80	31.73 - 38.81					
Yes	606	36.67	1.59	33.55 - 39.79	.39	.560	.773	-1.05	.295
Bothered by insects, bad weather: No	550	36.45	1.66	33.19 - 39.71					
Yes	542	35.26	1.67	31.99 - 38.53	.26	.612	.949	-.74	.461
Saw fish die: No	242	37.55	2.79	32.06 - 43.04					
Yes	859	34.50	1.25	32.04 - 36.96	1.20	.274	*** <.001	-.38	.707
Enjoyed outdoors, water, wildlife: No	28	29.61	5.87	17.57 - 41.65					
Yes	1133	35.60	1.14	33.36 - 37.84	.67	.414	*** <.001	-.75	.451

(a) z statistic (Mann-Whitney U test)

Table B-7. Relationships between activities done as a youth and mean current importance of fishing.

Activities Done as a Youth	N	Mean current importance of fishing (b)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event: Yes	183	4.28	.09	4.11 - 4.45	1.51	.219	* .040	-.95	.340
No	1104	4.16	.04	4.08 - 4.23					
Fished at trout farm or other fee fishing facility: Yes	238	4.12	.08	3.96 - 4.29	.45	.502	.551	-.71	.478
No	1053	4.18	.04	4.11 - 4.26					
Fished while on school-related experience: Yes	147	4.34	.09	4.15 - 4.52	2.81	.094	** .008	-1.51	.130
No	1148	4.16	.04	4.08 - 4.23					
Did water-related activities (boating, swimming): Yes	1154	4.16	.04	4.09 - 4.23	3.45	.063	.805	-1.96	* .050
No	160	4.35	.10	4.16 - 4.55					
Fished at summer youth camp: Yes	253	4.26	.08	4.11 - 4.41	1.21	.272	.140	-1.00	.315
No	1041	4.16	.04	4.08 - 4.24					
Fished with local youth organization (scouts, etc.): Yes	220	4.36	.08	4.21 - 4.51	5.52	* .019	* .017	-2.22	* .026
No	1072	4.14	.04	4.06 - 4.22					
Camped with family: Yes	878	4.23	.04	4.15 - 4.31	3.43	.064	* .037	-1.67	.096
No	443	4.09	.06	3.97 - 4.21					
Fished while camping with family: Yes	777	4.26	.04	4.18 - 4.35	7.49	** .006	*** <.001	-2.49	* .013
No	62	3.82	.18	3.46 - 4.18					

(a) z statistic (Mann-Whitney U test)

(b) Mean importance where 1=not at all important, 6=most important activity.

Table B-8. Relationships between activities done as a youth and mean current total days fishing per year.

Activities Done as a Youth	N	Mean current total days of fishing per year	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	(a) z	p
Attended fishing clinic, derby or other event: Yes	168	47.12	3.31	40.58 - 53.66	17.63	*** <.001	*** <.001	-4.47	*** <.001
No	1036	33.83	1.16	31.56 - 36.09					
Fished at trout farm or other fee fishing facility: Yes	222	39.84	2.64	34.64 - 45.04	3.39	.066	.410	-2.05	* .040
No	985	34.61	1.21	32.23 - 36.99					
Fished while on school- related experience: Yes	141	42.81	3.79	35.32 - 50.30	5.61	* .018	*** <.001	-1.93	* .053
No	1070	34.70	1.14	32.47 - 36.94					
Did water-related activities (boating, swimming): Yes	1085	35.87	1.16	33.59 - 38.15	.39	.534	.492	-.90	.366
No	142	33.75	3.13	27.57 - 39.93					
Fished at summer youth camp: Yes	234	41.89	2.78	36.41 - 47.37	7.83	** .005	*** <.001	-2.64	** .008
No	976	34.10	1.19	31.77 - 36.43					
Fished with local youth organization (scouts, etc.): Yes	205	40.03	2.58	34.94 - 45.11	3.27	.071	.309	-2.99	** .002
No	1001	34.73	1.22	32.34 - 37.12					
Camped with family: Yes	827	38.55	1.41	35.78 - 41.33	14.73	*** <.001	*** <.001	-3.29	*** <.001
No	403	29.69	1.59	26.57 - 32.81					
Fished while camping with family: Yes	731	39.70	1.54	36.67 - 42.72	8.80	** .003	*** <.001	-3.16	** .002
No	57	23.09	3.29	16.49 - 29.69					

(a) z statistic (Mann-Whitney U test)

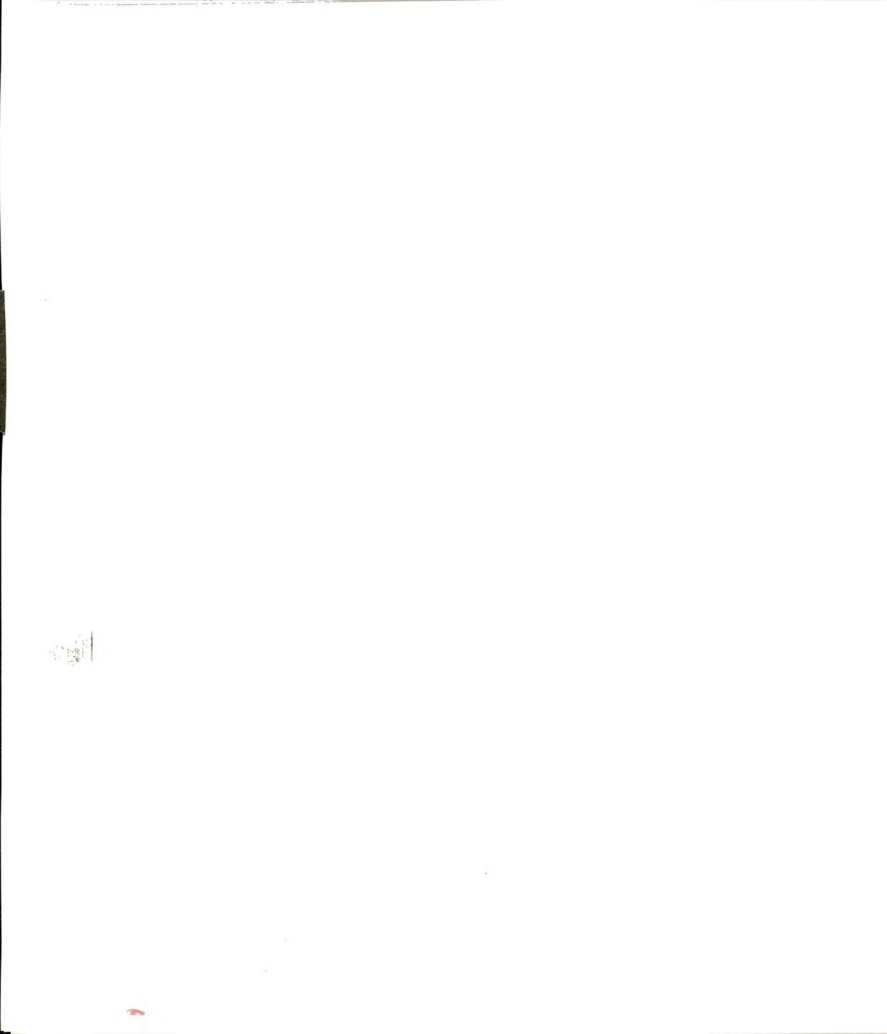


Table C-1. Relationships between childhood fishing involvement and mean current importance of fishing.

Childhood Fishing Involvement Variables	N	Mean current importance of fishing (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2 (b)	p
Level of fishing activity in childhood									
Did not fish	117	3.84	.13	3.58 - 4.09					
Tried fishing	80	4.01	.15	3.71 - 4.31					
Fished occasionally	508	4.04	.06	3.92 - 4.15					
Fished often	276	4.33	.07	4.19 - 4.48					
Fished frequently	158	4.42	.08	4.26 - 4.59					
Fished very frequently	94	4.66	.10	4.45 - 4.87	8.49	*** < .001	** .008	36.68	*** < .001
Importance of fishing in childhood									
Not at all important	236	3.74	.09	3.56 - 3.92					
Slightly important	219	3.88	.10	3.69 - 4.07					
Somewhat important	222	3.90	.07	3.75 - 4.04					
Important	321	4.37	.06	4.26 - 4.49					
More important than most activities	240	4.67	.06	4.55 - 4.79					
Most important activity	86	5.17	.11	4.96 - 5.39	34.30	*** < .001	*** < .001	155.86	*** < .001

(a) Mean importance where 1=not at all important, 6=most important activity.

(b) χ^2 (Kruskal-Wallis test)

Table C-2. Relationships between teen fishing involvement and mean current importance of fishing.

Teen Fishing Involvement Variables	N	Mean current importance of fishing (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2 (b)	p
Level of fishing activity in teens									
Did not fish	54	3.48	.17	3.13 - 3.83					
Tried fishing	48	3.60	.23	3.13 - 4.07					
Fished occasionally	395	3.71	.06	3.58 - 3.83					
Fished often	308	4.33	.07	4.20 - 4.46					
Fished frequently	290	4.50	.06	4.38 - 4.61					
Fished very frequently	223	4.76	.07	4.62 - 4.90	34.48	*** < .001	*** < .001	148.05	*** < .001
Importance of fishing in teens									
Not at all important	167	3.28	.12	3.05 - 3.51					
Slightly important	213	3.58	.09	3.40 - 3.75					
Somewhat important	250	3.98	.07	3.84 - 4.11					
Important	389	4.32	.05	4.22 - 4.42					
More important than most activities	254	5.00	.05	4.90 - 5.10					
Most important activity	62	5.58	.08	5.41 - 5.75	87.92	*** < .001	*** < .001	341.15	*** < .001

(a) Mean importance where 1=not at all important, 6=most important activity.

(b) χ^2 (Kruskal-Wallis test)



Table C-3. Relationships between childhood fishing involvement and mean current total days fishing per year.

Childhood Fishing Involvement Variables	N	Mean total days per year fishing	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	χ^2 (b)	p
Level of fishing activity in childhood									
Did not fish	100	22.69	2.24	18.25 - 27.13					
Tried fishing	73	28.23	4.06	20.14 - 36.32					
Fished occasionally	478	31.85	1.51	28.87 - 34.82					
Fished often	260	39.18	2.43	34.39 - 43.97					
Fished frequently	148	46.41	4.15	38.21 - 54.60					
Fished very frequently	91	51.18	5.01	41.21 - 61.14	9.78	*** <.001	*** <.001	39.68	*** <.001
Importance of fishing in childhood									
Not at all important	211	25.33	2.12	21.15 - 29.50					
Slightly important	203	32.34	2.50	27.40 - 37.27					
Somewhat important	205	30.46	2.37	25.79 - 35.14					
Important	306	35.83	2.03	31.84 - 39.81					
More important than most activities	226	44.89	2.92	39.13 - 50.64					
Most important activity	80	64.59	5.69	53.27 - 75.90	16.64	*** <.001	*** <.001	83.83	*** <.001

(b) χ^2 (Kruskal-Wallis test)

Table C-4. Relationships between teen fishing involvement and mean current total days fishing per year.

Teen Fishing Involvement Variables	N	Mean total days per year fishing	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Level of fishing activity in teens									
Did not fish	46	17.63	3.47	10.65 - 24.61					
Tried fishing	46	18.17	3.97	10.18 - 26.16					
Fished occasionally	364	22.08	1.34	19.44 - 24.72					
Fished often	291	33.15	1.90	29.42 - 36.89					
Fished frequently	272	43.00	2.26	38.55 - 47.45					
Fished very frequently	209	62.06	3.59	54.98 - 69.13	41.11	*** <.001	*** <.001	187.18	*** <.001
Importance of fishing in teens									
Not at all important	155	21.43	2.46	16.58 - 26.28					
Slightly important	190	21.08	1.83	17.47 - 24.70					
Somewhat important	238	27.55	1.90	23.80 - 31.30					
Important	365	38.36	1.94	34.56 - 42.17					
More important than most activities	238	50.74	2.74	45.33 - 56.14					
Most important activity	57	81.75	7.54	66.66 - 96.85	41.71	*** <.001	*** <.001	195.17	*** <.001

(b) X² (Kruskal-Wallis test)

Table D-1. Relationships between current fishing involvement and mean stewardship score in contacting management agencies.

Current Fishing Involvement Variables	N	Mean steward ship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	63	1.19	.06	1.07 - 1.31					
1-8 days	227	1.24	.03	1.18 - 1.31					
9-24 days	287	1.31	.03	1.25 - 1.36					
25-49 days	266	1.32	.03	1.26 - 1.38					
50+ days	392	1.33	.03	1.28 - 1.39	1.93	.103	.190	9.59	* .048
Current importance of fishing:									
My most important activity	175	1.33	.04	1.25 - 1.41					
More important than most activities	370	1.33	.03	1.28 - 1.38					
Important	389	1.32	.03	1.27 - 1.37					
Somewhat important	136	1.19	.04	1.12 - 1.27					
Slightly important	117	1.19	.04	1.12 - 1.28					
Not at all important	35	1.37	.11	1.15 - 1.59	2.80	* .016	*** < .001	15.28	** .009

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-2. Relationships between current fishing involvement and mean stewardship score for sorting trash to separate recyclables.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	73	2.47	.09	2.28 - 2.65					
1-8 days	240	2.35	.05	2.24 - 2.45					
9-24 days	307	2.32	.05	2.23 - 2.40					
25-49 days	292	2.17	.05	2.07 - 2.26					
50+ days	423	2.19	.04	2.11 - 2.27	3.87	** .004	1.000	16.44	** .003
Current importance of fishing:									
My most important activity	190	2.23	.06	2.11 - 2.35					
More important than most activities	391	2.24	.04	2.16 - 2.32					
Important	421	2.24	.04	2.16 - 2.13					
Somewhat important	160	2.26	.06	2.14 - 2.39					
Slightly important	121	2.41	.07	2.27 - 2.55					
Not at all important	37	2.43	.13	2.17 - 2.70	1.40	.222	.886	7.65	.177

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-3. Relationships between current fishing involvement and mean stewardship score in boycotting environmentally irresponsible companies.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	69	1.72	.08	1.56 - 1.89					
1-8 days	224	1.82	.05	1.73 - 1.92					
9-24 days	301	1.87	.04	1.79 - 1.95					
25-49 days	276	1.91	.04	1.82 - 1.99					
50+ days	400	2.01	.04	1.93 - 2.09	4.03	** .003	* .040	14.86	** .005
Current importance of fishing:									
My most important activity	182	1.99	.06	1.88 - 2.11					
More important than most activities	370	1.98	.04	1.91 - 2.06					
Important	399	1.87	.04	1.79 - 1.94					
Somewhat important	151	1.83	.06	1.72 - 1.95					
Slightly important	119	1.82	.07	1.69 - 1.96					
Not at all important	34	1.68	.13	1.41 - 1.94	2.77	* .017	1.000	13.84	** .017

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-4. Relationships between current fishing involvement and mean stewardship score in decreasing use of automobile.

Current Fishing Involvement Variables	N	Mean steward ship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	72	1.18	.05	1.07 - 1.29					
1-8 days	241	1.33	.04	1.25 - 1.40					
9-24 days	309	1.35	.03	1.29 - 1.41					
25-49 days	290	1.29	.03	1.23 - 1.35					
50+ days	423	1.36	.03	1.30 - 1.41	1.94	.102	.077	8.54	.074
Current importance of fishing:									
My most important activity	189	1.39	.05	1.30 - 1.49					
More important than most activities	396	1.30	.03	1.24 - 1.35					
Important	415	1.30	.03	1.25 - 1.35					
Somewhat important	157	1.36	.04	1.28 - 1.45					
Slightly important	127	1.32	.05	1.21 - 1.42					
Not at all important	36	1.42	.12	1.17 - 1.66	1.19	.314	*** <.001	3.80	.579

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-5. Relationships between current fishing involvement and mean stewardship score in contributing money to environmental organizations.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	69	1.61	.07	1.46 - 1.75					
1-8 days	236	1.59	.04	1.50 - 1.67					
9-24 days	297	1.71	.04	1.63 - 1.78					
25-49 days	286	1.70	.04	1.63 - 1.78					
50+ days	415	1.73	.03	1.66 - 1.79	2.04	.086	.671	9.10	.059
Current importance of fishing:									
My most important activity	188	1.75	.05	1.65 - 1.85					
More important than most activities	386	1.73	.03	1.66 - 1.79					
Important	405	1.67	.03	1.61 - 1.73					
Somewhat important	157	1.68	.05	1.57 - 1.78					
Slightly important	118	1.51	.06	1.39 - 1.62					
Not at all important	34	1.65	.13	1.39 - 1.90	2.45	*.032	.061	12.97	*.024

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-6. Relationships between current fishing involvement and mean stewardship score in writing letters to politicians.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	69	1.19	.05	1.09 - 1.29					
1-8 days	236	1.19	.03	1.13 - 1.25					
9-24 days	296	1.24	.03	1.19 - 1.30					
25-49 days	286	1.23	.03	1.18 - 1.29					
50+ days	410	1.27	.03	1.22 - 1.33	1.28	.277	** .002	4.74	.315
Current importance of fishing:									
My most important activity	185	1.26	.04	1.19 - 1.34					
More important than most activities	385	1.25	.03	1.20 - 1.30					
Important	405	1.26	.02	1.21 - 1.31					
Somewhat important	153	1.16	.03	1.10 - 1.22					
Slightly important	119	1.18	.04	1.10 - 1.25					
Not at all important	35	1.29	.10	1.09 - 1.48	1.63	.149	*** <.001	7.25	.202

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-7. Relationships between current fishing involvement and mean stewardship score in participating in environmental clean-up projects.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	69	1.33	.07	1.20 - 1.47					
1-8 days	240	1.27	.03	1.21 - 1.34					
9-24 days	304	1.38	.03	1.31 - 1.44					
25-49 days	281	1.31	.03	1.25 - 1.37					
50+ days	408	1.46	.03	1.40 - 1.52	5.67	*** <.001	* .024	22.10	*** <.001
Current importance of fishing:									
My most important activity	181	1.40	.04	1.31 - 1.49					
More important than most activities	385	1.39	.03	1.34 - 1.45					
Important	411	1.37	.03	1.32 - 1.43					
Somewhat important	154	1.29	.04	1.21 - 1.36					
Slightly important	123	1.33	.05	1.22 - 1.43					
Not at all important	34	1.41	.11	1.18 - 1.64	1.14	.339	** .004	5.70	.336

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-8. Relationships between current fishing involvement and mean stewardship score in taking legal action in environmental issues.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	68	1.25	.06	1.13 - 1.37					
1-8 days	235	1.19	.03	1.13 - 1.25					
9-24 days	297	1.31	.03	1.25 - 1.37					
25-49 days	277	1.32	.03	1.26 - 1.39					
50+ days	406	1.40	.03	1.34 - 1.46	5.42	*** < .001	*** < .001	19.45	*** < .001
Current importance of fishing:									
My most important activity	179	1.40	.05	1.31 - 1.50					
More important than most activities	377	1.36	.03	1.30 - 1.41					
Important	401	1.31	.03	1.26 - 1.37					
Somewhat important	153	1.24	.04	1.15 - 1.32					
Slightly important	123	1.20	.04	1.11 - 1.27					
Not at all important	35	1.23	.10	1.02 - 1.43	3.12	** .008	** .009	16.65	** .005

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-9. Relationships between current fishing involvement and mean stewardship score in taking part in habitat improvement projects.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	69	1.10	.04	1.03 - 1.17					
1-8 days	232	1.13	.02	1.08 - 1.17					
9-24 days	295	1.21	.03	1.16 - 1.26					
25-49 days	279	1.23	.03	1.17 - 1.28					
50+ days	400	1.31	.03	1.25 - 1.36	6.88	*** < .001	*** < .001	25.65	*** < .001
Current importance of fishing:									
My most important activity	179	1.28	.04	1.20 - 1.37					
More important than most activities	371	1.26	.03	1.21 - 1.31					
Important	403	1.22	.02	1.17 - 1.26					
Somewhat important	153	1.14	.03	1.08 - 1.20					
Slightly important	121	1.16	.04	1.09 - 1.23					
Not at all important	34	1.12	.07	0.97 - 1.26	2.93	.012	*** < .001	14.19	.015

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

Table D-10. Relationships between current fishing involvement and mean stewardship score in maintaining membership in environmental organizations.

Current Fishing Involvement Variables	N	Mean stewardship score (a)	S.E.	95% C.I.	F ratio	p	Homogeneity of variances (p)	X ² (b)	p
Days fishing per year:									
0 days	70	1.27	.07	1.13 - 1.41					
1-8 days	233	1.34	.05	1.25 - 1.43					
9-24 days	297	1.41	.04	1.33 - 1.50					
25-49 days	279	1.30	.04	1.23 - 1.38					
50+ days	399	1.39	.04	1.32 - 1.46	1.31	.264	* .038	4.58	.333
Current importance of fishing:									
My most important activity	178	1.34	.05	1.24 - 1.44					
More important than most activities	379	1.39	.04	1.32 - 1.46					
Important	399	1.40	.04	1.33 - 1.47					
Somewhat important	151	1.30	.05	1.20 - 1.41					
Slightly important	121	1.25	.06	1.14 - 1.36					
Not at all important	36	1.47	.14	1.20 - 1.75	1.39	.226	*** <.001	6.80	.236

(a) Where 1=Don't really bother about, 2=Do from time to time, 3=Do on a regular basis.

(b) X² (Kruskal-Wallis test)

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