



NOAA Technical Memorandum NMFS-NE-165

A Baseline Socioeconomic Study of Massachusetts' Marine Recreational Fisheries

**U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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Northeast Region
Northeast Fisheries Science Center
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A Baseline Socioeconomic Study of Massachusetts' Marine Recreational Fisheries

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^aRobins, C.R. (chair); Bailey, R.M.; Bond, C.E.; Brooker, J.R.; Lachner, E.A.; Lea, R.N.; Scott, W.B. 1991. Common and scientific names of fishes from the United States and Canada. 5th ed. *Amer. Fish. Soc. Spec. Publ.* 20; 183 p.

^bTurgeon, D.D. (chair); Quinn, J.F., Jr.; Bogan, A.E.; Coan, E.V.; Hochberg, F.G.; Lyons, W.G.; Mikkelsen, P.M.; Neves, R.J.; Roper, C.F.E.; Rosenberg, G.; Roth, B.; Scheltema, A.; Thompson, F.G.; Vecchione, M.; Williams, J.D. 1998. Common and scientific names of aquatic invertebrates from the United States and Canada: mollusks. 2nd ed. *Amer. Fish. Soc. Spec. Publ.* 26; 526 p.

^cWilliams, A.B. (chair); Abele, L.G.; Felder, D.L.; Hobbs, H.H., Jr.; Manning, R.B.; McLaughlin, P.A.; Pérez Farfante, I. 1989. Common and scientific names of aquatic invertebrates from the United States and Canada: decapod crustaceans. *Amer. Fish. Soc. Spec. Publ.* 17; 77 p.

^dRice, D.W. 1998. Marine mammals of the world: systematics and distribution. *Soc. Mar. Mammal. Spec. Publ.* 4; 231 p.

^eCooper, J.A.; Chapleau, F. 1998. Monophyly and interrelationships of the family Pleuronectidae (Pleuronectiformes), with a revised classification. *Fish. Bull. (U.S.)* 96:686-726.

^fMcEachran, J.D.; Dunn, K.A. 1998. Phylogenetic analysis of skates, a morphologically conservative clade of elasmobranchs (Chondrichthyes: Rajidae). *Copeia* 1998(2):271-290.

^gISO [International Organization for Standardization]. 1981. ISO standards handbook 3: statistical methods. 2nd ed. Geneva, Switzerland: ISO; 449 p.

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Acronyms

IMPLAN	=	impact analysis for planning
IOA	=	input-output analysis
MRFSS	=	(NMFS's) Marine Recreational Fisheries Statistics Survey
NMFS	=	(NOAA's) National Marine Fisheries Service

EXECUTIVE SUMMARY

This study investigated various socioeconomic attributes of Massachusetts' marine recreational anglers. Separate analyses were conducted for each of three saltwater angler modes of fishing: partyboat, private boat, and shore. Socioeconomic attributes of Massachusetts saltwater anglers were also compared across levels of recreation specialization. Recreation specialization describes the variation among participants of a particular activity through segmenting the population into meaningful and identifiable subgroups. For this study, anglers were segmented in recreation specialization levels by using an index based on four variables: commitment to saltwater fishing, relationships with other anglers, orientation to saltwater fishing, and types of experiences during fishing. Overall, private boat anglers were the most specialized group, and partyboat anglers were the least specialized. In general, partyboat anglers appeared less connected to partyboat fishing than were either private boat anglers to private boat fishing or shore anglers to shore fishing.

Anglers, initially contacted in the field following a fishing trip, were asked to participate in a followup mail survey. A total of 511 partyboat, 470 private boat, and 269 shore anglers returned completed survey questionnaires. Overall response rates were 50.5%, 65.5%, and 61.4% for partyboat, private boat, and shore modes, respectively. Over one-half (51%) of those surveyed in the partyboat mode were out-of-state (*i.e.*, non-Massachusetts) residents, while a smaller percentage of those surveyed in the shore (41%) and private boat modes (28%) were out-of-state residents. The overwhelming majority of anglers surveyed in all three modes were white males.

Massachusetts' saltwater anglers had a variety of reasons for going saltwater fishing—both catch-related and noncatch-related. On average, anglers in all three modes rated “fun of catching fish” and “for the experience of the catch” as very important reasons for fishing. Private boat and shore anglers also rated “relaxation” and “to be outdoors” as being between very and extremely important reasons to go fishing. Other highly rated noncatch-related reasons by anglers in all three modes included “to be close to the water” and “to share experiences with friends, family, and others.” Catching fish to eat was only rated between slightly and moderately important, on average, by anglers in all three modes.

Anglers were asked what their top three reasons were for going saltwater fishing in that particular mode. Private boat and shore anglers favored noncatch-related aspects of the fishing experience (*i.e.*, “for relaxation” and “to be outdoors”) over catch-related aspects as their number one reason for going fishing. Partyboat anglers also selected noncatch-related aspects of fishing more often than catch-related aspects as their top reason to go fishing. However, partyboat anglers placed more emphasis on social aspects of fishing such as “family recreation” and “sharing experiences with others” than did shore or private boat anglers. For all modes, the relative importance that anglers placed on every reason for going saltwater fishing increased with increasing specialization level. This was not surprising since highly specialized anglers, who fish more often, are expected to have stronger motivations to go fishing.

Anglers were asked to respond to a series of statements related to catch aspects of saltwater fishing. Results suggest that actually catching fish is not the only determinant of a satisfying fishing experience. In fact, a large percentage of anglers in each mode agreed or strongly agreed that a fishing trip could be a success even if no fish were caught (*i.e.*, partyboat 50%, private boat 76%, and shore 80%). Partyboat anglers, in general, placed more emphasis on catching fish as a condition for a successful trip than did anglers in the other two modes. The majority of anglers in all three modes either agreed or strongly agreed that the saltwater fishing opportunities in Massachusetts met their needs for a satisfying experience (*i.e.*, partyboat 69%, private boat 82%, and shore 72%).

Constraints, or reasons why anglers did not participate in fishing more often, were also investigated. For all three modes, the biggest apparent constraints were “too many other demands on my time” and “other leisure activities take up my time.” In general, the importance of these time-related constraints decreased with increasing specialization level for anglers in all three modes. For anglers in all three modes, lack of fish or low catch rates were not frequently cited as being important reasons for fishing less often. The proportion of anglers who agreed with the statement that “I believe an increase in my fishing activity would be bad for the resource” was also low for all three modes (*i.e.*, 10% partyboat, 4.5% private boat, and 5.1% shore). This belief suggests that either anglers think the resource is fairly healthy, or they simply do not think that one angler can have a negative impact. Cost of fishing was seen as a more important constraint among partyboat anglers and private boat anglers as compared to shore anglers.

For this study, anglers were categorized by mode group, based on the particular mode in which they were fishing when they were intercepted in the field. One objective of this research was to determine the extent to which anglers switch among different modes of saltwater fishing, and also switch between saltwater and freshwater fishing. Our results suggest that Massachusetts anglers tend to fish in multiple modes, water types (*i.e.*, freshwater and saltwater), and states during the course of a single year. Shore anglers (59%) were more likely to have purchased a freshwater fishing license in their state of residence compared to private boat anglers (52%) and partyboat anglers (35%). The proportion of anglers purchasing a freshwater license increased with specialization level for shore and partyboat anglers.

Another objective of this study was to investigate the decline in Massachusetts partyboat fishing in recent years. Results suggest that some private boat and shore anglers had shifted their fishing activity — less partyboat fishing and more

private boat and shore fishing — in recent years. For example, of those private boat anglers who reported a decrease in their partyboat fishing avidity from 1994 to 1998, 85% reported an increase in their saltwater private boat fishing avidity, and 59% also reported an increase in their saltwater shore avidity. The decline in partyboat fishing clientele may also be related to increased popularity with wildlife watching as an alternative form of marine recreation. Our results found that 28% of surveyed partyboat anglers indicated that they had taken a whale-watching cruise during the previous year.

The mode-switching trend that we found among some anglers (*i.e.*, less partyboat trips and more private boat and shore trips) may be related to a shift in species availability. Our results show that striped bass are by far the most popular species targeted by saltwater shore and private boat anglers in Massachusetts. During the early to mid-1990s, striped bass abundance increased dramatically as did recreational catches of this species. At the same time, the abundance of Atlantic cod, historically one of the most preferred partyboat species, declined sharply. Our results suggest that some anglers opportunistically switch fishing modes depending on the population status of preferred target species.

Input-output analysis was used to estimate the economic importance of shore fishing, private boat fishing, and partyboat fishing to the Commonwealth of Massachusetts and to two coastal subregions within the state. In total, anglers' expenditures in Massachusetts in 1998 generated almost \$350 million in sales and over \$142 million in income, and funded approximately 5,600 jobs in the commonwealth. Partyboat fees paid to for-hire owners were the single most important expense category for generating sales, income, and jobs from partyboat angler expenditures in Massachusetts and in the two coastal subregions within the commonwealth. Expenditures for meals at restaurants and for lodging at hotels generated the highest impacts for anglers fishing from shore and private boats. Bait and tackle purchases by shore and private boat fishermen also contributed significant impacts, as did launch fees and boat fuel purchases by private fishermen.

This study also examined angler attitudes towards recreational fishing regulations and fishery management tools. Our results show that anglers in all three modes were not very supportive of a proposed saltwater fishing license in Massachusetts. The percentage of anglers opposing a license altogether was greater for private boat (72.7%) and shore (75.1%) anglers than for partyboat anglers (56.6%). The difference was primarily made up by a much larger percentage of "no opinions" (22.1%) among partyboat anglers as compared to private boat (3.2%) and shore (4.3%) anglers. Anglers from all modes were generally supportive of minimum size limits, daily bag limits, and seasonal restrictions as recreational fishery management tools. Less than 10% of anglers in all three modes felt that the reason they didn't fish more often was related to fishing regulations being too restrictive.

INTRODUCTION

Saltwater fishing is an extremely popular form of outdoor recreation in Massachusetts that provides valuable economic, social, educational, and health-related benefits. Saltwater anglers have varied motivations and expectations for participating in recreational fishing, and they collectively make considerable economic expenditures while engaged in this form of recreation. Saltwater anglers also target a variety of different fish species, utilize different fishing techniques, and pursue different angling modes (*i.e.*, partyboat, charter boat, private boat, and shore).

The partyboat industry, in particular, occupies a unique position in marine recreational fisheries. It is not only a commercial enterprise that directly creates jobs and revenues, but it also attracts people to seaside localities, thus supporting many tourist-driven economies. In addition, partyboats serve an important role of providing affordable access to publicly shared marine resources, of which anglers without private boats may otherwise be deprived. However, there is a lack of specific data on angler motives and expectations for participating in partyboat fishing in Massachusetts. In addition, data are lacking on whether or not Massachusetts partyboat anglers' expectations are being met and motivations are being satisfied, and on whether expectations, motivations, or participation patterns have changed with changes in resource availability.

This study was conducted to answer some of these questions and to develop a better socioeconomic understanding of Massachusetts partyboat anglers. While partyboat anglers were the focus of this study, saltwater private boat and shore anglers were also surveyed for comparative purposes, and for exploring possible mode switching among anglers. Specific objectives addressed in this study are: 1) identification and evaluation of Massachusetts saltwater angler motivations, expectations, and outcomes concerning their fishing experience, including both catch and noncatch aspects; 2) segmentation of Massachusetts saltwater partyboat, private boat, and shore anglers into meaningful subgroups for analysis purposes; 3) evaluation of demand (*i.e.*, frequency of participation) for Massachusetts saltwater fishing opportunities as it relates to fishery resource condition/availability by fishing mode; 4) evaluation of angler switching among Massachusetts partyboat, private boat, and shore modes of fishing; 5) evaluation of trends in angler demand for species-specific Massachusetts recreational saltwater fishing activity; 6) determination and evaluation of economic expenditures and economic impacts according to economic sector and fishing mode; and 7) evaluation of Massachusetts saltwater anglers' attitudes towards specific fishery management actions.

METHODS

This section is organized into seven subsections: 1) "Development of Mail Survey Sample Frame," 2) "Development of Socioeconomic Survey Instrument," 3) "Implementation of Mail Survey," 4) "Identification of Angler Subgroups for Analysis," 5) "Treatment of Potential Sampling Bias," 6) "Data Processing and Analysis," and 7) "Economic Expenditure Analysis."

DEVELOPMENT OF MAIL SURVEY SAMPLE FRAME

Prior to implementation of the socioeconomic mail survey of Massachusetts' saltwater anglers, it was first necessary to establish sample frames for each mode of interest: partyboat, private boat, and shore. This establishment of sample frames was accomplished through the onsite collection of angler names and addresses at Massachusetts saltwater fishing locations. The Marine Recreational Fisheries Statistics Survey (MRFSS) is a national survey coordinated by NOAA's National Marine Fisheries Service (NMFS), and conducted annually in all coastal continental U.S. states except Texas. An important component of the MRFSS is the Intercept Survey which consists of onsite personal interviews with anglers at randomly selected marine fishing locations. For cost savings, logistical considerations, and survey design simplicity, we decided to piggyback the task of collecting angler names onto the MRFSS Intercept Survey. This piggybacking was done for private boat and shore modes only. Development of the partyboat sample is further discussed later.

Private Boat and Shore Modes

Collection of names and addresses occurred from May 1 to September 5, 1998. This sampling period was chosen because it corresponds with MRFSS sampling Waves 3 and 4 (*i.e.*, May 1 - August 31), and because it includes the peak saltwater fishing months in Massachusetts. Ideally, anglers in the sample frame would represent all Massachusetts saltwater anglers who participated in a particular angling mode during 1998. However, since recreational saltwater fishing occurs in Massachusetts during all months of the year, this study was limited in temporal scope. While anglers we encountered from May through early September may actually fish during other months as well, we cannot assume that our sample represented the full 12-mo Massachusetts saltwater angler population. Instead, our sample represents the angler population during this limited period.

However, MRFSS data show that 82% of 1998 Massachusetts saltwater anglers fished at least once during July or August, and more than three-fourths of Massachusetts saltwater trips (76.5%) and total catch (77.5%) for 1998 occurred between May 1 and August 31 (NMFS 2000). These MRFSS data strongly suggest that most of the 1998 Massachusetts recreational saltwater fishing population was eligible for sampling during our sample period. Furthermore, these data also show that our sample period included the most important months for Massachusetts recreational saltwater fishing in terms of participation, catch, and expenditures.

The MRFSS Intercept Survey is designed to sample fishing trips proportional to fishing activity across all locations within a given state, wave (*i.e.*, 2-mo sampling period), and mode. Individual sites are weighted (by mode) according to the fishing pressure at that site, and sites are then selected randomly. High-use sites have a greater probability of being drawn than do low-use sites. However, the MRFSS site selection procedure does not follow a straightforward proportional probability sampling approach. Instead, sites are grouped according to pressure ranks (*e.g.*, 1-4 anglers, 5-8 anglers, etc.), and a formula is used to determine the probability of each pressure rank group being drawn¹. Therefore, the probability that a given site will be drawn is a function not only of its pressure rank, but also of the number of other sites with the same pressure rank. The fewer sites that there are within a pressure rank group, the higher the probability of selection of any individual site within that group. Additionally, low-pressure rank groups are intentionally downweighted in the MRFSS sample draw. This downweighting is done primarily to reduce the cost per intercept, since low-pressure sites are less productive (*i.e.*, less anglers to interview). Despite these caveats, the statistical validity and representativeness of the MRFSS site selection sample design were considered adequate for the purposes of this study. For more details regarding MRFSS sampling methods, see the MRFSS user's manual (Gray *et al.* 1994).

At the conclusion of every MRFSS interview of private boat and shore anglers in Massachusetts during Waves 3 and 4 of 1998, MRFSS interviewers were instructed to ask anglers if they would be willing to participate in a followup mail survey conducted by the University of Massachusetts. If they agreed, the angler's name and address were recorded on an index card. MRFSS interviewers were also instructed not to collect more than one index card per family. Although most of our survey questions treat the individual angler (*i.e.*, not the household) as the unit of analysis, this one-card-per-family limit had to be done to avoid duplication and confusion on the economic expenditure questions. In such cases, interviewers were told to select an adult family member randomly to avoid biasing the sample intentionally (*e.g.*, always selecting the more experienced angler).

Target sample sizes for returned, usable mail surveys by mode were based on statistical considerations, comparisons with previous similar survey research (Rossi *et al.* 1983), and the relative importance of each mode to the study. Assuming a 60% response rate, to achieve our targeted sample size of 885 partyboat, 390 private boat, and 330 shore angler-returned surveys would require initial mailing lists of 1,475 partyboat anglers, 650 private boat anglers, and 550 shore anglers.

An attempt was also made to stratify our sample by wave. Since our survey targets anglers and not individual fishing trips, ideally we would want to sample the two waves proportional to the number of anglers per wave by mode. However, since the MRFSS does not estimate angler effort by mode, we had to approximate effort in terms of trips. The assumption we make here is that the distribution of trips (by mode) roughly approximated the distribution of anglers across the two waves of interest. A 5-yr average of MRFSS trip estimates was used to determine the proportion of our sample drawn from each wave. In both the partyboat and private boat modes, 30% of the trips occur in Wave 3 (*i.e.*, May-June), and 70% in Wave 4 (*i.e.*, July-August). In the shore mode, 46% of the trips occur in Wave 3, and 54% in Wave 4.

MRFSS interviewers collected usable names and addresses of 733 private boat (13% over target) and 464 shore anglers (16% under target) who indicated a willingness to participate in our followup mail survey. The percentage of sample collected by wave closely approximated our target for both the private boat mode (35% in Wave 3, 65% in Wave 4) and the shore mode (45% in Wave 3, 55% in Wave 4).

Partyboat Mode

The MRFSS target sample sizes for shore and private boat interviewers for Waves 3 and 4 were sufficiently large to assure an adequate sample for our purposes using the method of collecting angler names described previously. However, for the partyboat mode, the MRFSS sample size in Massachusetts was too small to guarantee a sufficient number of returned surveys after accounting for onsite refusals and a 60% mail survey response rate. In addition, the MRFSS combines charter boats with partyboats into a single intercept sampling mode. Therefore, the MRFSS randomized site selection sampling of this combined "for-hire" mode is representative of the combined (*i.e.*, partyboat and charter boat) fishing activity, not just partyboat activity. For these reasons, a different sampling approach was used to collect partyboat angler names than was used to collect private boat and shore angler names.

However, the partyboat angler sample frame was still obtained within the framework of the MRFSS in order to take advantage of the existing MRFSS fishing site list and well-established representative sampling scheme. To ob-

tain the sample frame in this manner, we had the MRFSS contractor — Quantech, Inc. — run simulated MRFSS site assignment draws for the Massachusetts party/charter boat mode for Waves 3 and 4. However, we first had to account for the MRFSS site selection procedure combining the “for hire” modes (*i.e.*, partyboats and charter boats), while our study was only interested in partyboats. Therefore, we eliminated from the site register all MRFSS partyboat/charter boat sites that only had charter boat activity, and reduced the fishing pressure rank of sites with both modes to only reflect partyboat activity. Experienced MRFSS interviewers were helpful in determining the new (*i.e.*, partyboat only) pressure ranks for these sites. Adjusted pressure ranks were assigned to each site by month and day type (*i.e.*, weekday and weekend/holiday). A total of 17 active Massachusetts partyboat fishing sites were included in our site selection program.

Since we did not know how many names and addresses we could obtain per assignment, the initial simulated draw was fairly large to avoid a major shortfall. As long as assignments are conducted in the order that they are drawn, the design’s randomness will not be hindered if some assignments (*i.e.*, reserves) are not actually completed. The site assignment list indicated which sites to visit, how often to visit each site, and in what order sites were to be visited over each 2-mo wave. For logistical and budgetary reasons, it was not always possible to follow the exact site visitation order, and some flexibility was allowed. The actual sites to visit and the frequency of visits per wave (as determined by the draw) took precedence over the specific dates assigned to each site. For example, if two nearby sites were to be visited 1 wk apart, but the driving distance to these sites was great, cost considerations would dictate both sites being sampled on the same day. Since sites were generally visited within 1 wk of assignment date, a fairly even distribution of site visits was achieved across the wave. Only one site (*i.e.*, Nantucket Island) was not visited due to budgetary considerations. The MRFSS assignment draw is designed not only to spread sampling effort across the wave, but also to achieve a 60%-40% split between weekend/holiday and weekday visits. Every effort was made to approximate this split in the distribution and management of our sampling effort whenever logistically possible.

Although our sample design was intended to sample proportionally to the number of partyboat anglers present, in reality, other factors affected interviewer productivity. One important factor was the receptivity of partyboat captains (or site administrators) to our interviewers or our study. For example, at some sites, our interviewers were physically chased off the premises and asked not to return, while at other sites, captains actively assisted in collecting angler names. Angler cooperation rates also seemed to vary by fishing site and location. Other factors that may have affected individual site productivity included trip type, physical layout of the site (*e.g.*, distance from boat to parking lot, and number and location of partyboats), and interviewer’s

personal skills. However, despite these potential sampling biases, we believe that our sample of Massachusetts partyboat angler names was still representative of the true population, and therefore sufficient for the purposes of this study.

Field staff for the collection of partyboat angler names and addresses were trained University of Massachusetts students. To decrease travel costs and to increase productivity, partyboat captains and mates were also employed at some sites to collect names and addresses of their patrons on specified days. A total of 1,064 usable names and addresses of partyboat anglers were collected for the followup mail survey. This 27% shortfall from our targeted sample size was primarily due to lower productivity than expected at some sites, and the unexpected departure of several field interviewers during the sampling period. The percentage of sample collected by wave (27% in Wave 3, 73% in Wave 4) closely approximated our target (30% in Wave 3, 70% in Wave 4).

DEVELOPMENT OF SOCIOECONOMIC SURVEY INSTRUMENT

Mail survey instrument questions were designed to address the specific objectives of this study (see “Introduction” section). Questionnaires for the three modes of interest (*i.e.*, partyboat, private boat, and shore) were nearly identical with only minor differences in wording and mode-specific questions (Appendices A1, A2, and A3). Recreational-fishing-related socioeconomic questions which had already been tested and proven effective in previous studies (*e.g.*, conducted at Texas A&M University and the University of Massachusetts), were used whenever possible. In some instances, new questions had to be developed; these questions were thoroughly reviewed inhouse for meaning, clarity, comprehensibility, and language.

Questionnaires were 16 pages long (on 7 x 8.5-inch pages), including a front cover and a back page for angler comments. Areas covered by the questionnaire included basic demographics, avidity (current and trends), species preferences, specialization level, trip expenditures, motivations, expectations, constraints, and attitudes towards fishery management. NMFS fishery economists were consulted in development of the economic expenditure section. For analysis purposes, the economic section of the survey split Massachusetts’ coastal counties into the following two zones: Zone 1 (Barnstable, Dukes, Nantucket, Plymouth, Bristol, Suffolk, and Norfolk Counties) and Zone 2 (Essex and Middlesex Counties). Economic expenditure information was collected by zone, and a map (Appendix B) was provided to help anglers delineate zones. Massachusetts Division of Marine Fisheries staff were also consulted in overall questionnaire design, particularly on questions related to fishery management and the possible implementation of a saltwater fishing license.

IMPLEMENTATION OF MAIL SURVEY

In an attempt to maximize return rates, we followed the techniques for mail survey implementation described by Salant and Dillman (1994). All members of the sample were mailed a personalized (*i.e.*, hand-signed, stamped, and addressed) advance-notice letter, reminding them that they had agreed to participate in the survey, and that they would be receiving their questionnaire within the following week. One-week later, a set of survey materials was mailed to all members of the sample. These materials included the questionnaire, a cover letter describing the intent of the survey, and a self-addressed stamped envelope for returning completed surveys. Two weeks after mailing the advance-notice letter, a thank you/reminder postcard was mailed to all members of the sample. This followup served to thank those who had already completed and returned their questionnaire, and to request a response from those who had not.

Five weeks after mailing the advance-notice letter, a second set of survey materials was sent to those who had not yet responded. This second survey package was identical to the first, except that the cover letter was revised to further encourage anglers to return completed surveys.

IDENTIFICATION OF ANGLER SUBGROUPS FOR ANALYSIS

Outdoor recreation participants generally display wide variation in their experiences, avidity, expertise, commitment, economic expenditures, and social interactions related to a particular activity. Connected to this variation are important sociological and psychological differences affecting motivations, expectations, desired outcomes, satisfaction levels, perceptions, and social norms. Outdoor recreation managers must recognize and accommodate these differences in order to provide satisfactory experiences to a widely diverse clientele.

Recreation Specialization

Recreation specialization is a concept and an area of study that attempt to describe the variation among participants of a particular activity (*e.g.*, recreational fishing) through segmenting the population into meaningful and identifiable subgroups. Recreation specialization studies have segmented recreation participants into meaningful subgroups using a variety of variables including equipment, skill level, activity setting preferences, avidity, centrality to lifestyle, and expenditures. However, Ditton *et al.* (1992) pointed to the tautological reasoning behind defining specialization in terms of behaviors and preferences, and then using specialization to predict those same behaviors and preferences. They reconceptualized specialization into a testable theory by linking it with elements of “social worlds.” A social world is defined as an “internally recog-

nizable constellation of actors, organizations, events and practices which have coalesced into a perceived sphere of interest and involvement for participants” (Unruh 1979). Our theoretical foundation for segmenting anglers into specialization groups was taken from the Ditton *et al.* (1992) reconceptualization of recreation specialization.

Recreation specialization is important for fishery management because it recognizes that there is no such thing as an “average” angler. Anglers generally display wide variation in their experiences, avidity, expertise, commitment, economic expenditures, and social interactions related to fishing. Connected to this variation are important sociological and psychological differences affecting motivations, expectations, desired outcomes, satisfaction levels, social norms, and attitudes towards fishery management decisions. For example, specialization theory predicts that more-specialized anglers will have greater support for fishery management rules and regulatory procedures, place more importance on non activity-specific elements of the fishing experience (*e.g.*, enjoying nature, relaxing, being with friends or family, etc.), place less importance on activity-specific elements of the fishing experience (*i.e.*, catching fish), and have a greater financial and emotional investment in fishing as compared to less-specialized anglers.

Recreation Specialization Index Development

A specialization index developed by Salz and Loomis (2000), that segments anglers based on four main social world characteristics (*i.e.*, orientation, experiences, relationships, and commitment), was utilized for this study. Mail survey questions were designed to measure each of these characteristics (see Appendices A1, A2, and A3, Questions 9-12). Question response options, consisting of statements describing a participant’s connection to an activity relative to that particular characteristic, were ordered from least specialized (response = 1) to most specialized (response = 4) along a four-point scale. Anglers were segmented into four groups (ranging from least to most specialized) based on cumulative response scores to index items as follows:

- If cumulative score = 4-6, then index level = 1 (least specialized).
- If cumulative score = 7-10, then index level = 2 (moderately specialized).
- If cumulative score = 11-13, then index level = 3 (very specialized).
- If cumulative score = 14-16, then index level = 4 (most specialized).

TREATMENT OF POTENTIAL SAMPLING BIAS

Although our survey design was intended, to the extent possible, to sample a representative population of Massachusetts saltwater anglers (by mode), potential sam-

pling bias still had to be addressed for each stage of sampling. The first stage involved the onsite collection of angler names and addresses at saltwater fishing locations throughout Massachusetts. A primary concern when sampling a population of recreational participants while they are actively participating in the activity of interest is that of avidity bias. Avidity bias refers to the fact that more avid participants are more likely to be encountered onsite, and, therefore, have a higher probability of being sampled. For example, an angler who fished from partyboats 10 days during our sampling period was 10 times more likely to be intercepted than an angler who only fished from a partyboat 1 day during that period. Avidity bias can be problematic if more avid participants differ from less avid participants in a way that is significant to the study. To correct for this potential bias, we created a weighting variable that would downweight more avid anglers, and upweight less avid anglers. This variable was the inverse of angler avidity (*i.e.*, weighting factor = $1/\text{avidity}$). Avidity was measured as the number of days fished recreationally in saltwater in Massachusetts in a particular mode during the past 12 mo. All analyses (except those in the “Economic Expenditure Analysis” section) were weighted by this variable (*e.g.*, weighted means and weighted frequency distributions). Ideally, the weighting variable would have been the inverse of angler avidity only during our 4-mo sampling period. However, since these data were not available, 12-mo avidity was used instead. Weighting factors using 12-mo avidity should closely resemble the true weights (during our sampling period), since most Massachusetts saltwater fishing activity occurs from May through August.

The second type of potential sampling bias that we addressed was related to nonresponse. Nonresponse bias occurs when a significant percentage of the sample does not respond and nonrespondents differ from respondents in a way that is significant to the results. Nonresponse bias can be a problem at any stage of sampling. For our study, nonrespondents included both anglers who refused to give their names for the followup mail survey (*i.e.*, initial refusals) and anglers who agreed to participate but did not follow through by returning the survey. While no data are available on initial refusals, our mail survey nonresponse rates ranged from 34.5% (private boat) to 49.5% (partyboat).

To test for nonresponse bias, we compared our mail survey respondents with those anglers intercepted onsite by the MRFSS for the waves corresponding with our sample period (*i.e.*, Waves 3 and 4, 1998). The percentage of anglers refusing to cooperate on MRFSS intercepts for these two waves was small in all modes². Therefore, by comparing mail survey respondents with MRFSS-intercepted anglers, we are essentially conducting a nonresponse check for both types of nonrespondents (*i.e.*, initial refusals and survey not returned) simultaneously. For the private boat and shore modes, the MRFSS sample design was identical to ours, since MRFSS interviewers actually collected our sample. In addition, our partyboat sample design closely approximated the MRFSS design since we used the same

site register, same site selection procedure, and same monthly targets. Both the 12-mo avidity in mode and the residence status (*i.e.*, Massachusetts versus out-of-state) were used to compare mail survey respondents with MRFSS-intercepted anglers. Results of this comparison are summarized in Table 1. In general, differences between mail survey respondent and MRFSS-intercepted angler avidity and residence composition were relatively small. These results suggest that mail survey nonrespondents did not differ significantly from MRFSS-intercepted anglers for the variables investigated. While the possibility remains that nonrespondents differed from anglers on other variables of interest, our initial investigation suggests that nonresponse bias is not of great concern here.

DATA PROCESSING AND ANALYSIS

Returned usable surveys were entered into three datasets (one per mode) for error checking and data analyses purposes. Range checks, outlier analyses, and multi-variable logic checks were performed, and corrections were made as necessary. In most cases, errors were converted to missing values, as it was not possible to determine positively the correct or intended value. Determinations of economic expenditure variable outliers were made in consultation with NMFS fishery economists experienced in working with such economic data. Most statistical analyses consisted primarily of weighted means and weighted frequency distributions (see earlier discussion of weighting procedures).

ECONOMIC EXPENDITURE ANALYSIS

In 1998, over 630 thousand saltwater anglers fished 3.4 million days in Massachusetts (NMFS 2000). Fishing from shore, a private boat, or a for-hire fishing boat offers an important leisure outlet for many individuals in the commonwealth, and also generates economic activity in the form of sales, income, and employment. During the course of a fishing trip, anglers purchase a variety of goods and services, spending money on bait, tackle, groceries, boat fees, lodging, restaurants, travel costs, and other trip-related expenditures. These purchases directly affect the sales, income, and employment of businesses that supply goods and services to saltwater anglers in Massachusetts. Businesses providing these goods and services must also purchase goods and services and hire employees, which in turn, generate more sales, income, and employment in the commonwealth.

Three levels of economic impacts result from purchases by saltwater fishermen: 1) direct, 2) indirect, and 3) induced. Direct impacts are the sales, income, and employment generated from initial purchases by anglers (*e.g.*, bait and tackle stores or sporting goods stores selling bait to anglers). Indirect impacts are sales, income, and employment of sup-

port industries that supply the directly affected industries (e.g., bait and tackle stores must purchase bait from dealers or fishermen, tackle from wholesalers, and electricity from power supply companies, and must pay labor). Induced impacts represent the sales, income, and employment resulting from expenditures by employees of the direct and indirect sectors (e.g., bait and tackle store employees purchase groceries and incur utility bills). Total impacts equal the sum of direct, indirect, and induced impacts.

Input-output analysis (IOA) is the most common approach available for describing the structure and interactions of businesses in a regional economy. An IOA is capable of tracking the quantity and purchase location of expenditures by anglers, support businesses, and employees of the directly and indirectly affected industries. Also, IOA assessments can be used to reveal how anglers' expenditures affect the overall economic activity in a particular region, such as sales, income, and employment. For the analysis presented here, a regional IOA modeling system called IMPLAN (impact analysis for planning) was used to determine the economic importance of shore fishing, private boat fishing, and partyboat fishing to the Commonwealth of Massachusetts and to two coastal subregions within the state (see Appendix B for map of Massachusetts Saltwater Fishing Zones).

Average daily trip-related expenditures per fisherman were computed from the 1998 survey of Massachusetts saltwater shore fishing, private boat fishing, and partyboat fishing. Mean expenditures were estimated for each mode of fishing in three geographical regions: 1) Zone 1 — Norfolk, Bristol, Plymouth, Barnstable, Dukes, and Nantucket Counties, 2) Zone 2 — Essex and Middlesex Counties, and 3) the entire state of Massachusetts. The average daily trip-related expenditures per participant were multiplied by the MRFSS estimates of total fishing days by mode in each geographical region in 1998 to derive total expense estimates.

Economic impacts were estimated by applying the total expense estimates to the appropriate IMPLAN sector multipliers (*i.e.*, expressing relationships between sectoral economic activity) in each geographical region. Regional impacts were estimated for sales, income, and employment. Sales reflect total dollar sales generated from expenditures by anglers in the particular region. Income represents wages, salaries, benefits, and proprietary income generated from angler expenditures. Employment includes both full-time and part-time workers, and is expressed as total jobs.

The economic expenditure analysis differed from all other analyses in several important ways. First, expenditures were not analyzed by mode and specialization level (as with the other objectives) but instead by mode and geographic zone. Saltwater-fishing-trip-related expenditures were estimated by angler residence category (*i.e.*, Zone 1, Zone 2, noncoastal Massachusetts, or out-of-state) and location of fishing trip (*i.e.*, Zone 1 or Zone 2). The economic analysis also differed in its focus on the angler trip

(and not the angler) as the unit of analysis. For the other objectives of this study, it was important to obtain a representative sample of Massachusetts saltwater anglers, and therefore, weighting was necessary to correct for avidity bias. However, for the economic analysis, weighting was not necessary since it was only important to obtain a representative sample of saltwater fishing trips (not anglers).

The 1998 Massachusetts saltwater fishing trip estimates needed to run IMPLAN were estimated based on MRFSS data³. However, only MRFSS coastal county resident trips were available at the level of detail necessary (*i.e.*, by mode, angler county of residence, and county of trip). MRFSS noncoastal county Massachusetts resident and noncoastal county out-of-state resident trips were only available in aggregate form and not at the county level. Therefore, ratio estimators from the MRFSS intercept data were used to assign the noncoastal county resident trips to either Zone 1 or Zone 2. These ratio estimators were simply the proportion of noncoastal county resident MRFSS intercepts by residence (*i.e.*, Massachusetts versus out-of-state), wave, and mode for 1998.

RESULTS AND DISCUSSION

A total of 511 partyboat, 470 private boat, and 269 shore mode questionnaires were returned in usable form (Table 2). Overall response rates were 50.5% for partyboat anglers, 65.5% for private boat anglers, and 61.4% for shore anglers.

Data analysis was divided into subsections according to seven project objectives. In addition to these seven subsections, two subsections are included for basic demographics and angler avidity, and for angler partyboat selection criteria. Each subsection (except those dealing with economic expenditure analysis and partyboat selection criteria) is further divided into four parts: three parts respectively discussing results for the three fishing modes (*i.e.*, partyboat, private boat, and shore), and one part comparing results among fishing modes. Each subsection highlights the most significant findings related to that objective, and references a series of tables with summarized data. As discussed in the "Methods" section, to correct for potential avidity bias, all means and frequency distributions are weighted by the inverse of avidity (*i.e.*, 12-mo, Massachusetts, saltwater trips, in specific mode).

MASSACHUSETTS RECREATIONAL SALTWATER ANGLER SEGMENTATION

Frequency distributions of responses to the four questions used to segment anglers into specialization groups were calculated for each angling mode (Table 3). For each specialization question, a response of "1" corresponded with specialization level 1 or "least specialized," a response

of “2” corresponded with specialization level 2 or “moderately specialized,” a response of “3” corresponded with specialization level 3 or “very specialized,” and a response of “4” corresponded with specialization level 4 or “most specialized.” Thus, an angler could be “least specialized” for one characteristic of specialization (*e.g.*, relationships) and “highly specialized” for another characteristic (*e.g.*, commitment). The four characteristics were combined to produce an overall level of specialization for each angler using the specialization index described earlier in the “Recreation Specialization Index Development” section.

Partyboat Anglers

More than two-thirds of partyboat anglers indicated they felt like “observers or irregular participants” when partyboat fishing, and less than 3% felt like “insiders to the sport” (Table 3). One-half of partyboat anglers reported having no established relationships with other partyboat anglers, and only 15% reported having established either “familiar” or “close” relationships.

Frequency distributions of partyboat angler specialization level by mode are shown in Table 4. Only 20% of partyboat anglers were categorized as either “very specialized” or “most specialized.”

Private Boat Anglers

About one out of four (27.1%) private boat anglers felt like an “insider” to private boat fishing, and another 44.8% felt like “habitual of regular participants.” Most private boat anglers reported they had established some relationships with other private boat anglers, and for many (45%), these relationships were described as “familiar” or “close.”

Overall, 64% of private boat anglers were categorized as either “very specialized” or “most specialized” using our method for segmentation. The “least specialized” private boat angler group was extremely small (0.5%). This group was excluded from subsequent subgroup analyses according to specialization level due to its small sample size.

There are several possible explanations as to why the “least specialized” group made up such a small proportion of our sample. First, we should not rule out the possibility that this specialization group may, in fact, be much smaller in size than the other specialization groups for saltwater private boat anglers. This would be the case if the learning curve from “least specialized” to “moderately specialized” requires a relatively short time period. Second, nonresponse bias could also be a possible explanation if the probability of an angler returning our survey was positively correlated to the angler’s specialization level. However, our nonresponse error checks do not support this explanation. Third, the choice of words we used for the “least specialized” response options could explain the low percentage of anglers selecting those options. Private boat anglers may

have felt too embarrassed or ashamed to identify themselves with words such as “outsider,” “uncomfortable,” “unsure,” or “uncertain,” all of which may have strong negative connotations.

Our results suggest that “least specialized” private boat anglers are either more difficult to sample than more-specialized anglers, or that “least specialized” anglers are truly a small minority of the saltwater private boat angling population.

Shore Anglers

Nearly one-half (47.2%) of shore anglers felt like “an observer or irregular participant” when saltwater shore fishing, while only 16.1% felt like “insiders to the sport” of saltwater shore fishing (Table 3). The majority of surveyed shore anglers indicated that they had not established “familiar” or “close” relationships with other shore anglers.

Similar to private boat anglers, a very small proportion (4.5%) of shore anglers was grouped into the “least specialized” level (Table 4). This very small proportion resulted in sample sizes for the “least specialized” group of shore anglers being too small to include in subsequent subgroup analyses according to specialization level. Explanations as to why the “least specialized” group made up such a small proportion of shore anglers are similar to those discussed for private boat anglers.

Mode Comparison

In general, partyboat anglers appeared less connected to partyboat fishing than were either private boat anglers to private boat fishing or shore anglers to shore fishing. More than two-thirds of partyboat anglers indicated they felt like “observers or irregular participants” when partyboat fishing, and less than 3% felt like “insiders” to the sport. By contrast 27.1% of private boat anglers felt like “insiders” to private boat fishing and another 44.8% felt like “habitual or regular participants.” One-half of partyboat anglers reported having no established relationships with other partyboat anglers and only 15% reported having established either “familiar” or “close” relationships. Most private boat and shore anglers said they established some relationships with other anglers in their respective modes, and for many (45% private boat, 42% shore) these relationships were described as “familiar” or “close.” Partyboat anglers were also, in general, far less committed to partyboat fishing than were private boat or shore anglers to their respective modes of fishing.

In general, there were more highly specialized private boat anglers than highly specialized shore anglers, who were, in turn, more numerous than highly specialized partyboat anglers. Only 20% of partyboat anglers were categorized as either “very” or “most specialized,” compared to 44% of shore anglers and 64% of private boat anglers.

BASIC DEMOGRAPHICS AND ANGLER AVIDITY

Partyboat Anglers

Nearly 80% of surveyed partyboat anglers were male (Table 5), and less than 6% indicated something other than “white” as their ethnic background. About one-half of the surveyed partyboat anglers were not residents of Massachusetts.

The group of “most specialized” partyboat anglers preferred full-day trips to half-day trips (Table 6). The proportion of partyboat anglers who did either evening/night or overnight partyboat fishing (in the previous year) increased with specialization level. Overnight trips, in particular, were almost exclusively made by “most specialized” partyboat anglers. As expected, years partyboat fishing, 12-mo avidity, age, and percent male all increased with partyboat respondent specialization level (Table 7). Whereas “least specialized,” “moderately specialized,” and “very specialized” partyboat anglers are evenly split between Massachusetts and out-of-state residents, a large majority of the “most specialized” partyboat anglers were from out-of-state. Although the sample size for this group was small, these results suggest that a significant proportion of the most committed, experienced, and knowledgeable Massachusetts partyboat anglers reside in other states.

Private Boat Anglers

An overwhelming majority of surveyed private boat anglers were white males (Table 5). Most surveyed private boat anglers were also Massachusetts residents. Similar to the partyboat mode, years fished, avidity, and percent male all increased with increasing specialization level among private boat anglers (Table 8).

Shore Anglers

Similar to the private boat mode, an overwhelming majority of shore anglers were white males (Table 5). A fairly large percentage of surveyed shore anglers were not Massachusetts residents (40.7%). Years fished, avidity, and percent male all increased with increasing specialization level among shore anglers (Table 9).

Mode Comparison

The partyboat survey had a greater proportion of female anglers (20.3%) than the other two modes (private boat 3.2%, shore 2.6%). A relatively large proportion of anglers were not residents of Massachusetts. However, this out-of-state residency was most evident in the partyboat (49.3%) and shore (40.7%) modes, and less so in the private boat mode (28.0%). Another difference between modes was that

for partyboat anglers, specialization level increases with age, whereas age appeared unrelated to specialization level among private boat and shore anglers.

IDENTIFICATION AND EVALUATION OF MASSACHUSETTS ANGLER MOTIVATIONS, EXPECTATIONS, AND OUTCOMES

Partyboat Anglers

Anglers were asked to indicate how important 15 different reasons were for going saltwater fishing in Massachusetts in their respective modes. Responses were scored on a five-point Likert scale ranging from “1 = not at all important” to “5 = extremely important.” On average, partyboat anglers rated “fun of catching fish” and “to be outdoors” as the two most important reasons (Table 10). Other highly rated reasons included “relaxation,” “experience of the catch,” and “to share experiences with others.” The reason of “obtaining fish to eat” was rated as being only slightly to moderately important.

Partyboat anglers were asked to select their top three reasons (from the 15 given) for going saltwater partyboat fishing in Massachusetts. Responses to this question were different than what one would have predicted based on relative importance scores from Table 10. “For family recreation” was selected as the most important reason more frequently (18.7%) than any other reason, even though this response only ranked seventh in relative importance based on the five-point scale (Table 11). Similarly, “to share experiences with friends, family, others” was selected as the most important reason second-most frequently (17.9%), even though this reason tied for third in relative importance based on the five-point scale. In terms of relative importance, “share experiences with friends, family, others” scored the same (3.81) as “for experience of the catch” and “relaxation.” However, far more anglers selected “share experiences with friends, family, others” (45.6%) as one of their top three reasons than selected “for experience of the catch” (24.8%) or “relaxation” (31.3%). These results suggest that for many partyboat anglers, the social aspects of partyboat fishing (and the family-related aspects in particular) are an extremely important reason for selecting this form of recreation. “Fun of catching fish” also ranked high as nearly half the partyboat anglers (46.1%) selected this as one of their top three reasons for partyboat fishing.

Reasons for partyboat fishing were also investigated according to specialization level (Table 12). In general, the importance of a reason for going partyboat fishing increased with specialization level for all reasons. This trend indicates that the more-specialized partyboat anglers have multiple reasons or motivations for going fishing, as opposed to less-specialized anglers who have fewer reasons. For example, “most specialized” partyboat anglers rated 11 (out of 15) reasons as being between “very” and “extremely” important, on average. In contrast, “least specialized”

partyboat anglers did not rate any reason as being between “very” and “extremely” important, on average.

When anglers were asked to rank their top three reasons, “fun of catching fish” was ranked high by all specialization levels (Table 13). The importance of “relaxation” and to “get away from the demands of others” generally increased with specialization level, whereas the social aspects of partyboat fishing were more important for less-specialized anglers. However, one-fourth of the “most specialized” partyboat anglers ranked “to catch fish to share with others” in their top three, indicating a dimension to the social benefits of partyboat fishing that occurs after the trip is completed. For beginners, the novelty of partyboat fishing was an important reason, as nearly 35% of “least specialized” anglers ranked “to experience new and different things” as one of their top three reasons.

To investigate catch-related aspects of saltwater fishing, we asked anglers whether they agreed or disagreed with a series of statements related to catching fish. Almost two-thirds (65.9%) of partyboat anglers agreed or strongly agreed with the statement that “the more fish I catch the happier I am”; however, over 57% of partyboat anglers agreed or strongly agreed with the statement that “I would rather catch one or two big fish than ten smaller fish” (Table 14). About one-half (51.7%) of all surveyed partyboat anglers either agreed or strongly agreed that “a successful trip is one in which many fish are caught”; on the other hand, almost one-half (49.9%) of surveyed partyboat anglers agreed or strongly agreed with, and only 26.3% disagreed or strongly disagreed with, the statement that “a fishing trip can be a success even if no fish are caught.”

Catch-related aspects of saltwater partyboat fishing were also investigated according to specialization level. More-specialized partyboat anglers were more likely to agree with the statement “I usually eat the fish I catch” (Table 15). “Least specialized” partyboat anglers were less concerned with the type of fish they caught than were the more-specialized groups.

Private Boat Anglers

On average, private boat anglers rated “relaxation” as the most important reason for going saltwater private boat fishing, followed by “fun of catching fish,” “to be outdoors,” and “to be close to the water” (Table 16). Reasons for going saltwater private boat fishing rated as less important included catching fish for consumption (*i.e.*, either to eat or to share with other people) and testing equipment. Over 40% of private boat anglers selected “to share experiences with friends, family, others” as one of their top three reasons for going fishing (Table 17), trailing only the reasons of “relaxation” (49.3%) and “to be outdoors” (44.6%).

Table 18 shows mean responses by private boat anglers concerning the importance of various attributes of their fishing experience according to specialization level, and Table 19 shows the proportion selecting each reason

as one of their top three according to specialization level. The importance of nearly every attribute of the private boat fishing experience increased with specialization level. This is not surprising since more-specialized anglers fish more often and should therefore have more reasons for going fishing, and should rank those reasons higher in importance.

A large proportion (75.6%) of private boat anglers either agreed or strongly agreed with the statement that “a fishing trip can be a success even if no fish are caught” (Table 20). However, only 25.4% of private boat anglers either agreed or strongly agreed with the statement that “when I go fishing I’m just as happy if I don’t catch a fish.” The responses to these two questions seem to indicate that while private boat anglers are motivated to fish for reasons other than catching fish, catching fish is an important factor in terms of their overall satisfaction. Only 19.9% of private boat anglers either strongly disagreed or disagreed with the statement that “I’m just as happy if I don’t keep the fish I catch.” This response suggests a fairly strong catch-and-release ethic among Massachusetts private boat saltwater anglers.

The importance of catching a particular type of fish increased with specialization level among private boat anglers (Table 21). The “most specialized” private boat anglers were more concerned with the size of the fish, and less concerned with the quantity, as compared to either moderately or very specialized groups.

Shore Anglers

On average, shore anglers rated “relaxation” as the most important reason for going saltwater shore fishing, followed by “fun of catching fish,” “to be outdoors,” and “to be close to the water” (Table 22). Consumption-related reasons (*i.e.*, to eat or share fish with others), to test equipment, and to catch a “trophy” fish were among the least highly rated reasons to go saltwater shore fishing. Nearly one-half of shore anglers (49.2%) selected “relaxation” as one of their top three reasons for going saltwater shore fishing (Table 23).

Similar to the other two modes, the importance of most attributes of the shore fishing experience increased with increasing specialization level (Table 24), indicating that more-specialized anglers have more reasons to go fishing than do less-specialized anglers. When asked to rank their top three reasons for saltwater shore fishing, less-specialized anglers placed more emphasis on the “fun of catching fish” than did more-specialized anglers (Table 25). By contrast, the “most specialized” shore anglers placed more importance on the “challenge or sport” and “catching a trophy fish” than did less-specialized shore anglers.

Nearly 80% of shore anglers either agreed or strongly agreed with the statement that “a fishing trip can be a success even if no fish are caught” (Table 26). Similarly, a large proportion of shore anglers indicated they were just as happy

if they didn't keep the fish they caught. The importance of catching a particular type of fish increased with specialization level among shore anglers (Table 27). The "most specialized" group was more concerned with the size of the fish caught and less concerned with the quantity as compared to either the "moderately specialized" or "very specialized" groups.

Mode Comparison

Private boat anglers generally rated all attributes of the fishing experience as more important reasons for going private boat fishing than partyboat anglers or shore anglers for fishing in their respective modes. For example, private boat anglers on average rated 6 out of the 15 attributes as being between "very" and "extremely" important reasons to go private boat fishing. By comparison, on average, shore anglers rated only 3 out of 15 attributes as being between "very" and "extremely" important reasons to go shore fishing, and partyboat anglers rated no attributes as being between a "very" and "extremely" important reason to go partyboat fishing. Partyboat anglers rated "for family recreation" as a more important reason to fish than did either private boat or shore anglers. For all three modes, anglers rated "fun of catching fish," "to be outdoors," and "relaxation" among the top three reasons to go fishing in their particular mode. "To obtain fish to eat" was rated by anglers from all modes, on average, as between "slightly" and "moderately" important.

Anglers were also asked to rank their top three reasons for fishing. "For family recreation" (18.7%) and "to share experiences with friends, family and others" (17.9%) were selected as the most important reason to go partyboat fishing more often than any other reasons. By contrast, the top two reasons selected as most important by private boat and shore anglers were "relaxation" and "to be outdoors." Only 16.5% of private boat anglers and 18.8% of shore anglers selected "for family recreation" as being one of their top three reasons to go fishing in their respective modes. Nearly one out of three (32.2%) partyboat anglers selected "for family recreation" as being one of their top three reasons to go partyboat fishing. These results suggest that partyboat angler motivations to saltwater fish are more connected to family than are private boat or shore angler motivations to saltwater fish.

Motivations to fish were also compared across modes according to specialization level. Major differences were found comparing the consumptive aspects of fishing across modes for the "most specialized" anglers. "Most specialized" partyboat anglers rated both "to obtain fish to eat" and "to catch fish to share with others" as being between "very" and "extremely" important reasons to fish. By comparison, "most specialized" shore anglers rated these two consumptive attributes as being between "slightly" and "moderately" important. "Most specialized" private boat anglers rated "to obtain fish to eat" as being between

"slightly" and "moderately" important, and "to catch fish to share with others" as being a "moderately" important reason to fish. For all three modes, the importance of obtaining fish to eat seemed to increase generally with increasingly angler specialization level.

These results are counter to what is generally predicted by current recreation specialization theory (Ditton *et al.* 1992). Previous studies have shown that the relative importance placed on consumptive aspects of fishing (as compared to nonconsumptive aspects) declines as the angler becomes more specialized. However, much of this research was done on freshwater anglers who may have very different motivations to fish than do saltwater anglers. Our results suggest that saltwater anglers may be more consumption oriented than freshwater anglers. Furthermore, among highly specialized saltwater anglers, partyboat anglers tend to be more consumption oriented than either private boat or shore anglers.

Catch-related aspects of saltwater fishing were also compared across fishing modes. About one out of four partyboat anglers (26.3%) disagreed or strongly disagreed with the statement that "a fishing trip can be a success even if no fish are caught." By comparison only 9.2% of private boat anglers and 5.1% of shore anglers either disagreed or strongly disagreed with this statement. Partyboat anglers, on average, were more likely than either private boat or shore anglers to agree with the statement that "a successful trip is one in which many fish are caught." Thus, catch-related aspects may be more important to partyboat anglers, on average, than to either private boat or shore anglers. Partyboat anglers were also more likely than either private boat or shore anglers to agree (or strongly agree) with the statement that "I usually eat the fish I catch." "Most specialized" partyboat anglers were, on average, less concerned about the type of fish they caught as compared to "most specialized" private boat and shore anglers.

EVALUATION OF DEMAND FOR MASSACHUSETTS SALTWATER FISHING OPPORTUNITIES AS IT RELATES TO FISHERY RESOURCE CONDITION/AVAILABILITY, ACCORDING TO MODE

This objective explores various reasons why anglers do not go saltwater fishing in Massachusetts more often. Reasons explored included real physical constraints (*e.g.*, time, cost, and distance) and psychological constraints (*e.g.*, crowding, expectations, satisfaction attainment). For purposes of this analysis, reasons for not fishing were grouped into three categories: resource-related reasons, fishing-mode-specific reasons, and other reasons.

Partyboat Anglers

For partyboat anglers, resource-related reasons were generally not important factors limiting their partyboat fish-

ing avidity (Table 28). For example, only one out of five partyboat anglers agreed or strongly agreed with the statement that “I can’t catch enough fish to suit me.” The three reasons partyboat anglers ranked highest for not fishing from partyboats more often were related to other demands on time, other leisure activities, and partyboats being too crowded. The majority (~70%) of partyboat anglers were generally satisfied overall with their partyboat fishing experiences in Massachusetts (Table 29).

According to specialization level, the costs of partyboat fishing and travel distance to sites were more important reasons for not fishing for “least specialized” partyboat anglers as compared to more-specialized anglers (Table 30). Similarly, other demands on time, other leisure activities, and difficulty finding others to fish with were viewed as more constraining by less-specialized anglers. Overall satisfaction with partyboat fishing in Massachusetts generally increased with angler specialization level (Table 31).

Private Boat Anglers

The two reasons private boat anglers ranked highest for not fishing more often were “too many other demands on my time” and “other leisure activities take up my time” (Table 32). Reasons related to fishery resource condition were generally not seen as affecting private boat fishing avidity. Overall, private boat anglers were very satisfied with both their private boat fishing experiences and boat dockage and launch sites in Massachusetts (Table 33).

Other demands on time, other leisure activities, and difficulty finding others to fish with were viewed as more constraining by less-specialized private boat anglers than by more-specialized private boat anglers (Table 34). Similarly, less-specialized private boat anglers were more constrained by not always having access to a boat as compared to more-specialized anglers. “Most specialized” private boat anglers were slightly more satisfied overall with the fishing opportunities in Massachusetts as compared to “moderately specialized” or “very specialized” private boat anglers (Table 35). However, “most specialized” private boat anglers were less satisfied with the boat dockage and launch sites available in Massachusetts as compared to “moderately specialized” private boat anglers (Table 35).

Shore Anglers

Similar to the other modes, shore anglers indicated that too many other demands on their time and other leisure activities were the most constraining reasons for not fishing more often (Table 36). Shore anglers generally did not consider the inability to catch enough fish (or keepers) to suit their needs as important fishing constraints. Nearly 80% of shore anglers either disagreed or strongly disagreed with the statement that “I believe an increase in my fishing activity would be bad for the resource.” Nearly three out of

four shore anglers (72.3%) agreed or strongly agreed that the saltwater shore fishing opportunities in Massachusetts met their needs for a satisfying experience (Table 37). Travel distance to shore fishing sites was a more constraining reason for fishing less often for “most specialized” anglers than for either “very specialized” or “moderately specialized” anglers (Table 38). “Very specialized” and “most specialized” shore anglers expressed a high degree of overall satisfaction with their saltwater shore fishing experiences in Massachusetts (Table 39).

Mode Comparison

Constraints, or reasons why anglers did not participate in fishing more often, were compared across modes. The majority of anglers in all three modes indicated that not being able to catch (or keep) enough fish to suit them was not an important reason why they did not fish more often. In general, lack of fish or low catch rates were not generally considered as being important reasons for fishing less often. The proportion of anglers who agreed or strongly agreed with the statement that “I believe an increase in my fishing activity would be bad for the resource” was also low for all three modes (10% partyboat, 4.4% private boat, 5.1% shore). This response suggests that either anglers believe the resource is fairly healthy, or that they simply do not think that one angler can have a negative impact. Anglers often do not realize the cumulative impact that recreational fishing can have, and based on comments we received, are more likely to blame commercial fishing for stock declines. Cost of fishing was seen as a more important constraint among partyboat anglers and private boat anglers as compared to shore anglers. About one-third of partyboat anglers and 27% of private boat anglers agreed or strongly agreed that the cost of saltwater fishing was a reason they did not fish more. By comparison, only 7.6% of shore anglers agreed or strongly agreed that the cost of fishing was a reason for fishing less often.

For all three modes, the biggest apparent constraints were “too many other demands on my time” and “other leisure activities take up my time.” In general, the importance of these time-related constraints decreased with increasing specialization level for anglers in all three modes. Our results were consistent with Ritter *et al.* (1992) who found that the constraint dimension “time” was indicated by nearly 75% of anglers they surveyed. Within the “time” dimension, they found that “work commitments” and “lack of time (general)” were the top-ranking constraint categories overall.

EVALUATION OF ANGLER SWITCHING AMONG FISHING MODES

For this study, anglers were categorized into mode groups (*i.e.*, partyboat anglers, private boat anglers and

shore anglers) based on the particular mode in which they were fishing when they were intercepted in the field. However, these groupings do not imply that anglers only fished in one mode, or that the mode assigned was their primary mode of interest (*e.g.*, most avid, “most specialized”). Mode designations were assigned for descriptive and clarifying purposes only. In fact, our results show that Massachusetts anglers tend to fish in multiple modes, water types (*i.e.*, freshwater and saltwater), and states during the course of a year. For this objective, we explored the diversity in fishing trip types taken by Massachusetts anglers, and in particular, the prevalence of angler switching from partyboat trips to other trip types in recent years. We also explored reasons for the decline given by anglers whose partyboat fishing trips have decreased recently.

Partyboat Anglers

In general, partyboat anglers were very active in other fishing modes and water types compared to their partyboat activity (Table 40). For example, while partyboat anglers averaged only 1.6 days of partyboat fishing in Massachusetts in the previous year, they spent 2.5 days saltwater shore fishing in Massachusetts, and 17.2 days freshwater fishing (all modes), in the previous year. “Most specialized” partyboat anglers spent as much time partyboat fishing out-of-state (6.5 days in the previous year) as they did in Massachusetts (6.6 days in the previous year), and also averaged 23.5 days of freshwater (all modes) fishing in the previous year (Table 40).

Overall, 35% of surveyed partyboat anglers indicated they had purchased a freshwater fishing license in their state of residence in 1998 (Table 41). The percentage of partyboat anglers who had purchased a freshwater license in 1998 increased with specialization level.

The popularity of wildlife watching as an alternative form of marine recreation has increased in recent years. Whale-watching boats, in particular, have replaced partyboats at popular coastal tourist locations, and may provide competition for the partyboats still located at these sites. From our survey, 28% of partyboat anglers overall indicated they had taken a whale-watching cruise during the previous year (Table 42). One Massachusetts partyboat captain told us that he converted from fishing to a “nature cruise” once a week with the assistance of an Audubon Society naturalist. More research needs to be done on this growing, nonconsumptive form of marine recreation.

In order to study general trends in fishing avidity, anglers were asked if their avidity (by mode) had decreased, increased, or stayed the same during the periods from 1988 through 1993, and from 1994 to 1998. More partyboat anglers reported an increase (35.8%) than a decrease (13.2%) in Massachusetts partyboat trips between 1994 and 1998 (Table 43). However, this increase probably represents the fact that a large proportion of partyboat anglers took their first partyboat trip in 1998. More partyboat anglers reported

an increase rather than a decrease in saltwater shore trips for both time periods (*i.e.*, 1988-1993 and 1994-1998), although many reported no activity in this mode (Table 43). It is interesting to note that 7.8% of partyboat respondents indicated taking no partyboat trips between 1997 and 1998, despite the fact that they were supposedly contacted in 1998 after a partyboat fishing trip. This response suggests that some anglers misinterpreted this question by not counting the trip they were actually surveyed after.

To investigate mode switching in more detail we focused only on those anglers who reported a decrease in their partyboat fishing avidity from 1994 to 1998. Among partyboat anglers who reported a decrease in their partyboat fishing avidity from 1994 to 1998, most also reported declining charter boat, saltwater private boat, saltwater shore, and freshwater fishing avidity over the same time period (Table 44). For these anglers, in general, the decline in their partyboat activity seems to be a part of a general drop in their overall fishing activity.

Private Boat Anglers

Private boat anglers tended to focus their fishing activity in the private boat mode, switching between freshwater and saltwater throughout the course of a year (Table 45). Private boat anglers were also somewhat active in shore fishing in both freshwater (5.2 days in the previous year) and saltwater (5.9 days in the previous year) in Massachusetts. Overall, private boat anglers spent very little time partyboat fishing in Massachusetts (0.3 days in the previous year). Interestingly, the number of private boat freshwater days fished in Massachusetts decreased with increasing angler specialization level, while the number of private boat freshwater days fished by anglers from other states increased with specialization level (Table 45). Overall, 52% of private boat anglers indicated they had purchased a freshwater fishing license in their state of residence in 1998 (Table 41).

Significantly more private boat anglers reported a decrease (20.4%) than reported an increase (5.9%) in partyboat activity from 1994 to 1998 (Table 46). For this same time period, 62.7% of private boat anglers reported an increase in their saltwater private boat fishing avidity compared to only 8.4% reporting a decrease. Private boat anglers also seemed to increase their saltwater shore fishing activity during these years. These results suggest that some private boat anglers were changing their fishing activity away from partyboats and towards more saltwater private boat, and to some extent, shore fishing.

Among private boat anglers who reported a decrease in their partyboat fishing avidity from 1994 to 1998, many also reported declining charter boat and freshwater fishing avidity over the same time period (Table 47). However, an overwhelming majority (84.7%) reported an increase in their saltwater private boat fishing avidity, and most (59.2%) also reported an increase in their saltwater shore avidity. These

results provide further evidence for mode switching (among private boat anglers) away from partyboat, charter boat, and freshwater fishing and towards more saltwater private boat and shore fishing from 1994 to 1998.

Shore Anglers

Shore anglers averaged 8.3 days saltwater shore fishing, 0.8 days partyboat fishing, and 2.8 days saltwater private boat fishing in Massachusetts in the previous year (Table 48). Shore anglers were, in general, more avid in freshwater than in saltwater, and spent nearly as many days freshwater private boat fishing (10.8) as they did freshwater shore fishing (12.3) in the previous year. “Most specialized” saltwater shore anglers were far more avid in terms of partyboat fishing than were less-specialized saltwater shore anglers. However, most of their partyboat trips were on out-of-state partyboats (1.5 days in the previous year), not on Massachusetts partyboats (0.6 days in the previous year). Overall, 59% of shore anglers indicated that they had purchased a freshwater fishing license in their state of residence in 1998 (Table 41).

More shore anglers reported a decrease (16.1%) than an increase (7.1%) in partyboat activity from 1994 to 1998 (Table 49), while shore avidity seemed to increase during this period. Thus, some mode switching from partyboat to shore is evident among our shore survey anglers as well.

Among shore anglers who reported a decrease in their partyboat fishing avidity from 1994 to 1998, a plurality also reported declining charter boat, private boat, and freshwater fishing avidity, and increasing saltwater shore avidity, over the same time period (Table 50).

Mode Comparison

Surveyed private boat anglers averaged 10.3 saltwater private boat fishing days in the previous year in Massachusetts. By comparison, surveyed shore anglers averaged 8.6 saltwater shore fishing days in the previous year in Massachusetts, while surveyed partyboat anglers averaged only 1.6 saltwater partyboat fishing days in the previous year in Massachusetts. Thus, partyboat fishing is more of a rare-event recreational activity for many anglers compared to the other two modes of fishing. Whereas surveyed private boat and shore anglers did very little partyboat fishing in Massachusetts (an average of 0.3 and 0.8 days in the previous year, respectively), partyboat anglers were fairly active in the other two modes. For example, partyboat anglers spent, on average, 2.5 days saltwater shore fishing in Massachusetts, 11 days freshwater shore fishing, and 6.2 days freshwater private boat fishing in the previous year. “Most specialized” partyboat anglers averaged 6.6 days of Massachusetts partyboat fishing in the previous year, but spent nearly as many days (6.5) partyboat fishing from other states in the previous year.

Shore anglers (59%) were more likely to have purchased a freshwater fishing license in their state of residence compared to private boat anglers (52%) and partyboat anglers (35%). The proportion of anglers purchasing a freshwater license increased with specialization level for shore and partyboat anglers. Our results suggest that anglers highly specialized in a particular type of fishing (*e.g.*, saltwater partyboat) do not, in general, focus their entire fishing effort on that one type of fishing, but rather are more likely to participate actively in other types of fishing as well. Therefore, the specialization indicators used to segment anglers (*i.e.*, commitment, relationships, experience, and orientation) may carry over from one type of fishing to another. If an angler is highly specialized in one type of fishing (*e.g.*, partyboat), then there may be a higher probability that he/she will also be highly specialized in another type of fishing (*e.g.*, freshwater shore). More research is needed to clarify the relationship between specialization level for different types of fishing.

To further investigate the recent decline in Massachusetts partyboat fishing, we focused our analysis on anglers who indicated their Massachusetts partyboat fishing avidity had declined from 1994 to 1998. Of those partyboat anglers who indicated their Massachusetts partyboat fishing avidity had declined from 1994 to 1998, a greater percentage also reported a decrease (compared to those reporting an increase or no change) in both their saltwater private boat and shore fishing avidity in Massachusetts during the same time period. By contrast, of those private boat anglers who indicated their Massachusetts partyboat fishing avidity had declined from 1994 to 1998, the majority indicated an increase in their saltwater private boat and shore fishing avidity in Massachusetts during the same time period. Of those shore anglers who indicated their Massachusetts partyboat fishing avidity had declined from 1994 to 1998, the majority indicated an increase in their saltwater shore fishing avidity, but a decrease in private boat fishing avidity, in Massachusetts during the same time period.

EVALUATION OF TRENDS IN ANGLER DEMAND FOR SPECIES-SPECIFIC MASSACHUSETTS PARTYBOAT FISHING ACTIVITY

Partyboat Anglers

Anglers were asked to rank their top three preferred species to catch when saltwater fishing (by mode) in Massachusetts. Atlantic cod (27.2%) was the most preferred species among partyboat anglers, followed by striped bass (17.7%), bluefish (13.6%), and summer flounder (11.1%) (Table 51). A relatively large percentage (15.6%) of partyboat anglers indicated they did not have a preferred species to catch. Differences in species preferences were also explored according to specialization level (Table 52). Preference towards catching black sea bass, tautog, and scup seemed

generally to increase with increasing level of partyboat angler specialization. By contrast, “most specialized” partyboat anglers were less interested in striped bass, bluefish, and summer flounder as compared to less-specialized partyboat anglers. MRFSS intercept data (weighted by fishing effort in trips) were used to determine what species Massachusetts partyboat anglers actually said they were targeting. Table 53 shows the percentage of partyboat trips targeting each species. From 1996 to 1998 there was a sharp dropoff in the percentage of angler trips targeting Atlantic cod. However, in 1999 the percentage of partyboat trips targeting cod increased, although not to the level of 1996. The percentage of MRFSS-intercepted partyboat anglers targeting scup increased from 2.3% in 1996 to 9.6% in 1999.

The difference between what partyboat anglers reported as their preferred species on our survey (Table 51) and what they reported as targeting during MRFSS intercepts (Table 53) may reflect the level of control partyboat anglers have over species targeted. Typically, the partyboat captain decides what species the boat will target on a given day, and may switch species mid-trip, depending on a variety of factors (e.g., weather, tide, catch rates, etc.). Anglers do have some control over species targeted by means of their selecting a particular boat. However, the species they prefer to catch may not always be an option due to seasonal availability, driving distance to a partyboat targeting that species, or cost considerations.

Partyboat anglers were asked a series of questions regarding the importance of the species that partyboats target as it relates to their fishing activity. Table 54a shows that, in general, partyboat anglers did not agree with the following statement as a reason for fishing from partyboats less often: “partyboats don’t target the types of fish I prefer to catch.” When asked how important were the types of fish that partyboats target as a factor in deciding to go partyboat fishing versus some other kind of fishing, the modal response was “moderately important” (Table 54b). The importance of this factor generally increased with partyboat angler specialization. Nearly 40% of “most specialized” partyboat anglers indicated that the species that partyboats targeted was an “extremely important” factor in deciding on whether to go partyboat fishing as compared to some other type of fishing. The relative importance of partyboat target species in determining which particular Massachusetts partyboat to fish with increased greatly with increasing partyboat angler specialization level (Table 54c).

Private Boat Anglers

Striped bass is by far the most preferred species to catch among private boat saltwater anglers in Massachusetts (Table 55). This holds for all specialization levels (Table 56). Bluefish were identified as an important second option for preferred species among most surveyed private boat saltwater anglers. The percentage of private boat trips targeting striped bass in Massachusetts increased from 1996 to 1998, before dropping off slightly in 1999, whereas the per-

centage targeting bluefish and Atlantic cod decreased after 1996 (Table 57).

Shore Anglers

Similar to private boat anglers, an overwhelming majority (70.3%) of Massachusetts saltwater shore anglers preferred to catch striped bass over any other species (Table 58). Bluefish are important as a secondary species among Massachusetts saltwater shore anglers. More than one-third (36.2%) of shore anglers had no preferred third species after striped bass and bluefish. According to specialization level, the importance of striped bass and bluefish as a preferred target species seemed to increase with shore angler specialization level (Table 59). By contrast, winter flounder was a more important target species among “moderately specialized” anglers than it was among “most specialized” anglers. From 1996 through 1998, the proportion of saltwater shore trips in Massachusetts targeting striped bass generally increased, while the proportion targeting bluefish decreased (Table 60). This trend reversed somewhat in 1999, although striped bass were still by far the most-targeted species on Massachusetts saltwater shore fishing trips in 1999.

Mode Comparison

Private boat (75.9%) and shore (70.3%) anglers overwhelmingly selected striped bass as their most preferred species. No other species was selected by more than 8% of anglers from either mode. By contrast, the most-preferred-species selections by partyboat anglers were more evenly distributed, with five species (Atlantic cod 27.2%, striped bass 17.7%, bluefish 13.6%, summer flounder 11.1%, and haddock 8.2%) receiving more than 8% of the vote. Partyboat anglers do, however, have less control than either shore or private boat anglers over actual species targeted, since the partyboat captain generally makes this determination. A much larger percentage of partyboat anglers (15.6%) than of private boat (0.6%) and shore (7.6%) anglers indicated no primary species preference. This pattern probably reflects the fact that more partyboat anglers were “least specialized,” and that many of them were intercepted during their first lifetime partyboat fishing trip.

Also, when comparing species preferred across modes, it is important to consider species availability differences. Shore anglers do not have access to offshore species that can be targeted by private boat and partyboat anglers. Similarly, private boat anglers with small boats typically fish within bays and state territorial waters, and therefore do not have access to open-ocean, deepsea species often targeted by partyboats.

Differences in species preferences with increased specialization level were more pronounced for partyboat anglers than for the other two modes. In particular, “most specialized” partyboat anglers were far less interested in

targeting striped bass and summer flounder than were “least specialized,” “moderately specialized,” or “very specialized” partyboat anglers. Similarly, “most specialized” partyboat anglers were far more interested in targeting black sea bass, tautog, and scup than were “least specialized,” “moderately specialized,” or “very specialized” partyboat anglers. Striped bass and bluefish were both very popular preferred species choices for shore and private boat anglers across all specialization levels.

DETERMINATION AND EVALUATION OF ECONOMIC EXPENDITURES AND ECONOMIC IMPACTS ACCORDING TO ECONOMIC SECTOR AND FISHING MODE

Total economic impacts generated from saltwater fishing expenditures by mode and geographical area are summarized in Table 61. The \$4.5 million spent by partyboat anglers in Massachusetts in 1998 generated \$6.9 million in sales, \$2.7 million in personal income, and 142 jobs in the commonwealth. In contrast, the \$190.9 million spent by private boat anglers in Massachusetts generated \$197.0 million in sales, \$79.1 million in income, and approximately 3,000 jobs. Angler expenditures on shore fishing trips in Massachusetts (\$121.3 million) resulted in an additional \$146.0 million in sales, \$60.2 million in personal income, and 2,477 jobs. In total, partyboat, private boat, and shore angler expenditures in Massachusetts in 1998 generated \$350 million in sales, \$142 million in income, and approximately 5,600 jobs in the commonwealth.

Total partyboat, private boat, and shore angler expenditures in Zone 1 in 1998 (\$247 million) generated approximately \$267 million in sales, \$110 million in income, and 4,100 jobs (within Zone 1). Total partyboat, private boat, and shore angler expenditures in Zone 2 in 1998 (\$59 million) resulted in approximately \$60 million in sales, \$24 million in personal income, and 1,000 jobs (in Zone 2). Partyboat expenditures and impacts were similar across the two zones, while private boat and shore impacts were generally 4-6 times higher in Zone 1. The sum of the expenditures and impacts shown for Zone 1 and Zone 2 are not tantamount to the estimates shown for Massachusetts. The Massachusetts estimates capture expenditures and impacts that occur anywhere in the state, including noncoastal counties that are to the west of the Zone 1 and Zone 2 boundaries. Thus, the expenditures and impacts shown for Massachusetts are slightly higher than the sum of the expenditures and impacts that occurred in Zone 1 and Zone 2.

The estimates of each category of trip-related expenditures derived from the survey are presented in Tables 62-70. Expenditures and impacts generated in Massachusetts by mode are presented first (Tables 62-64), followed by expenditures and impacts accruing to Zone 1 by mode (Tables 65-67) and then to Zone 2 by mode (Tables 68-70).

Partyboat fees paid to for-hire owners were the single most important expense category for generating sales, income, and jobs from partyboat angler expenditures in all

three Massachusetts geographical regions. Meals at restaurants and lodging were also important expense categories for generating sales, income, and jobs from partyboat angler expenditures in all three regions. Parking was an important expense category for generating income in Zone 2.

Expenditures for meals at restaurants and for lodging generated the highest impacts for anglers fishing from private boats in all three geographical regions. Bait and tackle purchases, launch/docking fees, and boat fuel purchases by private boat fishermen further contributed significant impacts to all three geographical regions.

Expenditures for meals at restaurants and for lodging generated the highest impacts for anglers fishing from shore in Zone 1 and throughout the commonwealth. Expenditures for meals at restaurants and for bait and tackle purchases generated the highest impacts in Zone 2.

In some cases, many of the dollars spent by saltwater anglers in Massachusetts actually impact the economies of other states and countries. For example, of the \$399,000 spent in 1998 by partyboat anglers on automobiles (within Massachusetts), only \$118,000 had a direct impact on sales in the Massachusetts economy (Table 62). A similar situation existed for purchases of bait and tackle, groceries, and boat fuel in all three Massachusetts geographical regions. Of the 14 expenditure categories analyzed in this study, four (*i.e.*, automobiles, bait and tackle, groceries, and boat fuel) directly impacted sales in the economies of other regions, with the single exception of grocery sales to private boat owners in Zone 2. For the remaining 10 categories, 100% of the expenditures remained within the three geographical regions (*i.e.*, total expenditures equaled direct impacts on sales).

The results are conservative in the sense that they include only trip-related angler expenses. Auxiliary expenditures on fishing equipment (*i.e.*, rods and reels), clothing, and incidental purchases by nonfishing companions were not included, even though they may have occurred as a direct result of fishing. Taken as a whole, the economic impacts presented in this analysis provide an indication of the dependence of Massachusetts' economy on marine recreational fishing expenditures.

EVALUATION OF MASSACHUSETTS RECREATIONAL SALTWATER ANGLERS' ATTITUDES TOWARD SPECIFIC FISHERY MANAGEMENT ACTIONS

Anglers were asked a series of questions on their support or agreement with various fishery management actions. Tables 71-79 summarize the responses.

Partyboat Anglers

The majority of partyboat anglers opposed the idea of a mandatory saltwater fishing license (Table 71). Opposition to a saltwater license was consistent for both Massa-

Massachusetts residents and out-of-state anglers in all modes. Opposition to a saltwater license increased with specialization level among partyboat anglers (Table 72).

In general, surveyed partyboat anglers did not agree with the statement that “fishing regulations are too restrictive” as a reason for not saltwater fishing more often (Table 73). Partyboat anglers indicated tremendous support for the use of minimum size limits as a tool to manage Massachusetts’ recreational saltwater fisheries (Table 74). Nearly three-fourths of partyboat anglers also either “supported” or “strongly supported” both daily bag limits and seasonal restrictions as fishery management tools.

According to specialization level, differences in attitudes towards particular fishery management tools were found between “most specialized” partyboat anglers and the other three less-specialized groups (*i.e.*, “least,” “moderately,” and “very”). “Most specialized” partyboat anglers showed stronger support for minimum size limits and slot limits, but less support for bag limits and seasonal restrictions, as compared to less-specialized anglers (Tables 75). “Most specialized” partyboat anglers also indicated fairly strong opposition to prohibiting harvest of striped bass in federal waters and to simultaneously reducing both the minimum size limit and the daily bag limit of a hypothetical species.

Private Boat Anglers

The majority of private boat anglers opposed the idea of a mandatory saltwater fishing license (Table 71). The proportion opposing a license altogether was 70.0% for Massachusetts residents and 77.5% for out-of-state residents. No major differences in opinions about a saltwater license were found across private boat angler specialization levels.

Private boat saltwater anglers generally disagreed with the statement that “fishing regulations are too restrictive” as a reason for not saltwater fishing more often (Table 73). Private boat anglers generally supported the use of minimum size limits, bag limits, slot limits, and seasonal restrictions as tools to manage Massachusetts’ recreational saltwater fisheries (Table 76). Opinions among private boat anglers were split on “not allowing harvest of striped bass in federal waters.” As many private boat anglers either supported or strongly supported this regulation (36.5%) as did oppose or strongly oppose it (35.5%).

Private boat anglers’ attitudes towards the use of the fishery management tools explored here did not vary tremendously according to specialization level (Table 77).

Shore Anglers

The majority of surveyed shore anglers opposed the idea of a mandatory saltwater fishing license (Table 71). The percentage opposing a license was 75.1% for Massachusetts resident and out-of-state anglers combined. Shore

anglers from other states showed more support (19.2%) than Massachusetts residents (7.8%) for a license with a fee, while the reverse was true for a “no fee” license (2.3% out-of-state versus 11.3% Massachusetts). No major differences in opinions about a saltwater license were found across shore angler specialization levels.

In general, shore anglers disagreed with the statement that “fishing regulations are too restrictive” as a reason for not saltwater fishing more often (Table 73). Shore anglers generally supported the use of minimum size limits, bag limits, slot limits, and seasonal restrictions as tools to manage Massachusetts’ recreational saltwater fisheries (Table 78). Support for bag limits and seasonal restrictions increased with specialization level among shore anglers (Table 79). Interestingly, “very specialized” shore anglers were more opposed to the following fishery management tools than either “moderately” or “most specialized” shore anglers: 1) restricting striped bass harvest in federal waters, 2) simultaneously reducing both the minimum size and daily bag limit of a hypothetical species, and 3) simultaneously increasing both the minimum size and daily bag limit of a hypothetical species. More investigation is needed to determine why this intermediate specialization group might be more opposed to the fishery management tools examined than either less-specialized or more-specialized anglers.

Mode Comparison

The percentage opposing a license altogether was greater for private boat (72.7%) and shore (75.1%) anglers than for partyboat anglers (56.6%). The difference was primarily made up by a much larger percentage (22.1%) of “no opinions” among partyboat anglers as compared to private boat (3.2%) or shore (4.3%) anglers. The larger percentage of “no opinions” among partyboat anglers reflects the fact that more partyboat anglers are “least specialized” and may have no vested, long-term interest in the sport. Opposition to a saltwater fishing license increased with increasing specialization level among partyboat anglers. By comparison, there was no obvious relationship between saltwater fishing license opposition and specialization level among either private boat or shore anglers.

Comparisons were made among the three modes regarding angler attitudes towards the use of fishery management tools for Massachusetts’ recreational saltwater fisheries. Anglers from all modes showed support (or strong support) for minimum size limits, daily bag limits, and seasonal restrictions. Partyboat anglers, in general, were somewhat supportive of slot limits and prohibiting the sale of fish by recreational anglers, although they were less supportive than either private boat or shore anglers regarding these fishery management tools. For example, 56.6% of private boat anglers and 65.1% of shore anglers supported or strongly supported no sale of fish by recreational anglers. By contrast, only 45.6% of partyboat anglers supported this fishery management tool.

IMPORTANCE OF VARIOUS ITEMS IN THE SELECTION OF A PARTICULAR PARTYBOAT ON WHICH TO FISH

Partyboat anglers were asked to rate the importance of several items in their selection of a particular partyboat on which to fish. "Courteous and helpful crew" was the most important factor overall as two-thirds of anglers rated this "very important" or "extremely important" in their selection (Table 80). Other important factors included "previous personal experience" and "cost of boat fees." The importance of a "courteous and helpful crew" and "previous personal experience" both increased with respondent specialization level (Table 81). Similarly, the importance of the number, size, and species typically caught, of the captain's reputation, and of boat size also increased with increasing specialization level.

ENDNOTES

1. Personal communication: D.A. Van Voorhees, National Marine Fisheries Service, Fisheries Statistics & Economics Division, Silver Spring, MD.
2. Personal communication: K. Gillis, National Marine Fisheries Service, Fisheries Statistics & Economics Division, Silver Spring, MD; August 2000.
3. Personal communication: A. Lowther, National Marine Fisheries Service, Fisheries Statistics & Economics Division, Silver Spring, MD; May 25, 2000.

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REFERENCES CITED

- Ditton, R.B.; Loomis, D.K.; Choi, S. 1992. Recreation specialization: reconceptualization from a social worlds perspective. *J. Leisure Res.* 24(1):35-51.
- Gray, G.W.; Kline, L.L.; Osborn, M.F.; Salz, R.S.; Van Voorhees, D.A.; Witzig, J.F. 1994. MRFSS user's manual—a guide to the National Marine Fisheries Service recreational fisheries statistics survey database. *Atl. States Mar. Fish. Comm. Spec. Rep.* 37.
- NMFS [National Marine Fisheries Service, Fisheries Statistics & Economics Division]. 2000. Marine Recreational Fisheries Statistics Survey <<http://www.st.nmfs.gov/st1/recreational/index.html>>. Accessed July 11, 2000.
- Ritter, C.; Ditton, R.B.; Riechers, R.K. 1992. Constraints to sport fishing: implications to fisheries management. *Fisheries (Bethesda)* 17(4):16-19.
- Rossi, P.H.; Wright, J.; Anderson, A. 1983. Handbook of survey research. New York, NY: Academic Press.
- Salant, P.; Dillman, D.A. 1994. How to conduct your own survey. New York, NY: John Wiley & Sons.
- Salz, R.J.; Loomis, D.K. 2000. Development and verification of a specialization index for angler segmentation. In: Kyle, G., comp., ed. Proceedings of the 1999 Northeastern Recreation Research Symposium; 1999 April 11-14; Bolton Landing, NY. *U.S. For. Serv. Gen. Tech. Rep. NE-269*.
- Unruh, D.R. 1979. Characteristics and types of participation in social worlds. *Symbol. Interact.* 2:115-130.

Table 1. Comparison of mail survey respondents with MRFSS-intercepted anglers for nonresponse bias check

Mode	Variable	Population	
		Mail Survey Respondents	MRFSS-Intercepted Anglers
Partyboat	Days fished in past 12 mo	10.9	11.1
	Percentage who were Massachusetts residents	55.5	66.7
Private boat	Days fished in past 12 mo	36.5	29.8
	Percentage who were Massachusetts residents	81.3	80.6
Shore	Days fished in past 12 mo	32.2	29.6
	Percentage who were Massachusetts residents	69.1	76.3

Table 2. Level of response (number and percentage) to angler questionnaire for each mode

Type of Response	Mode					
	Partyboat		Private Boat		Shore	
	No.	%	No.	%	No.	%
Initial sample	1,064	—	733	—	464	—
Mortality	52	—	15	—	26	—
Nondeliverable	49		12		25	
Not-usable upon return	3		3		1	
Effective sample	1,012	100.0	718	100.0	438	100.0
Nonresponse	501	49.5	248	34.5	169	38.6
Usable returned surveys	511	50.5	470	65.5	269	61.4

Table 3. Responses (given as percentage of anglers) to specialization index questions by mode. (See Appendices A1, A2, and A3 for complete wording of Questions 9-12.)

Response	Mode		
	Partyboat	Private Boat	Shore
When I participate in the sport of saltwater (partyboat, private boat, shore) fishing, I feel like:			
1) an outsider	3.9	0.5	0.8
2) an observer or irregular participant	67.3	27.6	47.2
3) an habitual or regular participant	26.0	44.8	35.9
4) an insider to the sport	2.8	27.1	16.1
During a saltwater (partyboat, private boat, shore) fishing experience, I can best be described as:			
1) being somewhat uncertain	10.1	1.1	9.7
2) having some understanding of the sport	39.6	25.0	33.2
3) becoming comfortable with the sport	40.3	52.7	44.3
4) a knowledgeable expert in the sport	10.0	21.2	12.8
My relationships with other saltwater (partyboat, private boat, shore) anglers are:			
1) not established	50.0	13.3	18.3
2) very limited	34.9	41.8	39.9
3) one of familiarity	10.3	27.8	26.4
4) close	4.8	17.2	15.4
My commitment to saltwater (partyboat, private boat, shore) fishing is:			
1) almost nonexistent	20.6	0.4	5.3
2) moderate	61.7	33.1	41.9
3) fairly strong	13.4	47.1	35.5
4) very strong	4.2	19.4	17.4

Table 4. Frequency distribution (given as percentage of anglers) of specialization level for partyboat, private boat, and shore saltwater anglers

Specialization Level	Mode		
	Partyboat	Private Boat	Shore
Least	15.6	0.5	4.5
Moderate	64.5	35.4	51.4
Very	17.1	46.8	30.8
Most	2.7	17.3	13.3

Table 5. Basic demographics of anglers according to survey mode

Demographic	Mode		
	Partyboat	Private Boat	Shore
Gender (%)			
Male	79.7	96.8	97.4
Female	20.3	3.2	2.6
Ethnic background (%)			
White	94.2	98.6	94.5
Black	2.0	1.0	1.8
Hispanic	1.8	0.2	<0.1
Asian	1.0	0.2	0.2
Native American Indian	0.4	<0.1	0.0
Other	0.5	<0.1	3.5
Average age (yr)	40.8	46.3	46.2
Average formal education (yr; high school graduate = 12)	14.7	14.3	14.7
Modal annual household income range (\$000s)	60-85	60-85	45-60
Residence (%)			
Massachusetts	50.7	72.0	59.3
Out-of-state	49.3	28.0	40.7

Table 6. Percentage of partyboat anglers who said they took at least one of the following partyboat trip types in the previous 12 mo, according to specialization level

Partyboat Trip Type	Specialization Level			
	Least	Moderate	Very	Most
Half-day trip	64.9	63.6	56.4	21.0
Full-day trip	35.1	38.6	53.7	87.3
Evening/night trip	0.0	3.7	7.7	14.9
Overnight trip	0.0	1.2	2.7	22.7

Table 7. Average years of experience partyboat fishing, average number of days partyboat fishing during previous 12-mo period, and basic demographics of partyboat anglers (age, gender, and residence), according to specialization level

Attribute/Demographic	Specialization Level			
	Least	Moderate	Very	Most
Average number of years since started partyboat fishing	3.9	14.1	21.1	28.6
Average number of days partyboat fishing in Massachusetts during past 12 mo	1.1	1.3	2.4	6.6
Average number of days partyboat fishing in another state during past 12 mo	0.1	0.3	1.9	6.5
Average age (yr)	34.6	41.0	43.4	54.0
Gender (%)				
Male	64	82	88	95
Female	36	18	12	5
Residence (%)				
Massachusetts	51	52	49	28
Out-of-state	49	48	51	72
				51
				49

Table 8. Average years of experience saltwater private boat fishing, average number of days saltwater private boat fishing during previous 12-mo period, and basic demographics of private boat anglers (age, gender, and residence), according to specialization level

Attribute/Demographic	Specialization Level			
	Least	Moderate	Very	Most
Average number of years since started private boat fishing	N/A ^a	15.6	21.0	22.4
Average number of days private boat fishing in Massachusetts during past 12 mo	N/A	4.6	10.3	21.6
Average age (yr)	N/A	44.6	47.4	45.9
Gender (%)				
Male	N/A	96	97	99
Female	N/A	4	3	1
Residence (%)				
Massachusetts	N/A	80	66	67
Out-of-state	N/A	20	34	33
				72
				28

^aN/A = not available, due to sample size being too small for specialization group.

Table 9. Average years of experience saltwater shore fishing, average number of days saltwater shore fishing during previous 12-mo period, and basic demographics of shore anglers (age, gender, and residence), according to specialization level

Attribute/Demographic	Specialization Level			
	Least	Moderate	Very	Most
Average number of years since started saltwater shore fishing	N/A ^a	23.1	21.4	28.7
Average number of days saltwater shore fishing in Massachusetts during past 12 mo	N/A	4.7	12.2	15.1
Average age (yr)	N/A	46.9	45.9	45.7
Gender (%)				
Male	N/A	96	99	100
Female	N/A	4	1	0
Residence (%)				
Massachusetts	N/A	57	65	44
Out-of-state	N/A	43	35	56

^aN/A = not available, due to sample size being too small for specialization group.

Table 10. Relative importance placed on various reasons for going partyboat fishing in Massachusetts

Reason	Importance Level (% of anglers)				Relative Importance ^a
	Not At All	Slightly	Moderately	Very	
Fun of catching fish	3.9	3.0	20.8	39.0	33.4
To be outdoors	2.9	4.0	19.8	44.5	28.9
Relaxation	4.5	6.4	21.6	39.3	28.3
For experience of catch	5.1	7.7	21.0	33.8	32.4
Share experiences with friends, family, others	5.6	5.4	19.9	40.3	28.8
To be close to water	6.0	10.6	23.9	35.7	23.8
For family recreation	9.3	8.1	24.0	35.1	23.6
To experience new and different things	5.9	10.6	29.6	36.5	17.4
For challenge or sport	15.9	16.2	22.9	26.5	18.6
Get away from demands of others	22.1	18.3	25.8	16.3	17.6
To catch fish to share with other people	25.9	21.5	25.5	17.6	9.6
To obtain fish to eat	27.7	24.3	21.7	16.1	10.2
To develop skills	35.4	20.1	25.0	13.3	6.2
To test equipment	64.4	18.6	11.8	2.7	2.6
To win boat "pool"	68.5	16.6	9.5	3.2	2.2

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Table 11. Percentage of anglers ranking a reason as first-, second-, or third-most important for going partyboat fishing in Massachusetts

Reason	Relative Importance ^a	Rank			Total ^b
		1	2	3	
Fun of catching fish	3.95	11.0	17.6	17.5	46.1
To be outdoors	3.93	8.1	9.8	12.8	30.7
Relaxation	3.81	12.7	11.7	6.9	31.3
For experience of catch	3.81	5.9	9.9	9.0	24.8
Share experiences with friends, family, others	3.81	17.9	15.4	12.3	45.6
To be close to water	3.61	7.5	7.7	8.5	23.7
For family recreation	3.56	18.7	8.9	4.6	32.2
To experience new and different things	3.38	5.1	4.9	7.8	17.8
For challenge or sport	3.16	5.8	5.8	5.8	17.4
Get away from demands of others	2.89	1.9	3.4	3.7	9.0
To catch fish to share with other people	2.64	1.1	0.6	4.3	6.0
To obtain fish to eat	2.56	3.6	3.8	5.8	13.2
To develop skills	2.35	0.0	0.2	1.0	1.2
To test equipment	1.61	0.4	0.0	0.0	0.4
To win boat "pool"	1.54	0.4	0.5	0.2	1.1
		100.0	100.0	100.0	

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

^bPercentage of anglers for whom the reason was ranked in the top three.

Table 12. Relative importance^a placed on various reasons for going partyboat fishing in Massachusetts, according to specialization level

Reason	Specialization Level			
	Least	Moderately	Very	Most
Fun of catching fish	3.62	3.97	4.26	4.76
Relaxation	3.06	3.89	4.11	4.58
To be outdoors	3.51	3.96	4.10	4.37
For experience of catch	3.45	3.83	4.06	4.69
Share experiences with friends, family, others	3.40	3.86	3.94	4.41
To be close to water	3.06	3.60	3.99	4.57
For family recreation	3.12	3.64	3.50	3.60
For challenge or sport	2.62	3.13	3.74	4.39
To experience new and different things	3.66	3.46	3.33	4.03
Get away from demands of others	2.12	2.96	3.32	4.48
To catch fish to share with other people	2.13	2.58	3.13	4.25
To obtain fish to eat	2.13	2.54	2.92	4.25
To develop skills	1.82	2.30	2.95	3.64
To test equipment	1.24	1.56	1.91	3.44
To win boat "pool"	1.31	1.50	1.82	2.58

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Table 13. Percentage of anglers ranking a reason as one of their top three reasons for going saltwater partyboat fishing in Massachusetts, according to specialization level

Reason	Specialization Level			
	Least	Moderately	Very	Most
Fun of catching fish	44.2	46.0	52.5	44.4
Relaxation	19.8	34.4	28.7	53.0
To be outdoors	34.9	30.2	30.1	28.9
For experience of catch	24.4	23.9	29.8	15.1
Share experiences with friends, family, others	43.0	48.1	40.4	31.4
To be close to water	19.8	23.4	27.8	14.3
For family recreation	30.2	35.3	20.4	7.6
For challenge or sport	18.6	14.5	29.5	15.6
To experience new and different things	34.9	16.0	6.9	0.8
Get away from demands of others	4.7	9.6	8.8	31.3
To catch fish to share with other people	4.7	4.3	10.1	24.4
To obtain fish to eat	18.7	12.2	12.1	21.5
To develop skills	0.0	1.0	2.9	4.4
To test equipment	0.0	0.6	0.0	0.0
To win boat "pool"	2.3	0.7	0.3	6.8

Table 14. Extent to which partyboat anglers agreed or disagreed with various catch/retention statements

Statement	Agreement Level(% of anglers)				Relative Agreement ^a	
	Strongly Disagree	Disagree	Neutral	Agree		
The more fish I catch, the happier I am	5.5	9.2	19.6	49.8	16.1	3.62
A fishing trip can be a success even if no fish are caught	5.8	20.5	23.8	38.1	11.8	3.29
I usually eat the fish I catch	11.3	9.7	14.9	36.6	27.4	3.59
A successful trip is one in which many fish are caught	4.7	18.1	25.6	39.2	12.5	3.37
I would rather catch one or two big fish than ten smaller fish	4.0	16.2	22.4	40.8	16.5	3.50
When I go fishing, I'm just as happy if I don't catch a fish	16.2	42.0	20.8	15.5	5.6	2.52
It doesn't matter to me what type of fish I catch	2.6	21.3	26.3	39.5	10.5	3.34
The bigger the fish, the better the fishing trip	2.8	18.4	27.4	36.2	15.2	3.43
I'm just as happy if I don't keep the fish I catch	7.4	25.4	18.2	34.5	14.5	3.23

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 15. Relative agreement^a by partyboat anglers with various catch/retention statements, according to specialization level

Statement	Specialization Level			
	Least	Moderately	Very	Most
The more fish I catch, the happier I am	3.60	3.60	3.68	3.85
A fishing trip can be a success even if no fish are caught	3.03	3.28	3.53	3.42
I usually eat the fish I catch	2.98	3.68	3.75	4.40
A successful trip is one in which many fish are caught	3.35	3.44	3.16	3.75
I would rather catch one or two big fish than 10 smaller fish	3.25	3.46	3.81	3.71
When I go fishing, I'm just as happy if I don't catch a fish	2.37	2.50	2.65	2.98
It doesn't matter to me what type of fish I catch	3.80	3.29	3.08	3.33
The bigger the fish, the better the fishing trip	3.32	3.48	3.36	3.48
I'm just as happy if I don't keep the fish I catch	3.32	3.19	3.25	2.90

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 16. Relative importance placed on various reasons for going saltwater private boat fishing in Massachusetts

Reason	Not At All	Importance Level (% of anglers)			Extremely	Relative Importance ^a
		Slightly	Moderately	Very		
Relaxation	1.0	1.6	6.9	40.6	49.9	4.37
Fun of catching fish	0.7	2.4	13.5	39.9	43.5	4.23
To be outdoors	0.3	2.8	11.2	48.4	37.4	4.20
To be close to water	2.6	1.8	11.1	43.3	41.2	4.19
Share experiences with friends, family, others	1.4	3.7	16.5	45.4	33.1	4.05
For experience of catch	1.8	5.3	18.5	40.2	34.1	4.00
For challenge or sport	4.9	7.3	24.6	34.9	28.3	3.74
Get away from demands of others	13.1	9.4	19.4	32.7	25.6	3.48
For family recreation	9.3	8.2	30.1	37.6	14.9	3.41
To experience new and different things	8.2	11.6	32.7	31.8	15.7	3.35
To develop skills	12.0	15.5	30.7	27.4	14.4	3.17
To catch a “trophy” fish	26.0	15.6	25.6	18.2	14.5	2.80
To catch fish to share with other people	27.3	24.2	22.1	15.4	11.2	2.59
To obtain fish to eat	30.8	18.9	25.9	14.8	9.6	2.54
To test equipment	28.8	32.8	28.2	6.4	3.8	2.24

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Table 17. Percentage of anglers ranking a reason as first-, second-, or third-most important for going saltwater private boat fishing in Massachusetts

Reason	Relative Importance ^a	Rank			Total ^b
		1	2	3	
Relaxation	4.37	21.1	16.1	12.1	49.3
Fun of catching fish	4.23	10.2	11.1	14.4	35.7
To be outdoors	4.20	22.8	12.3	9.5	44.6
To be close to water	4.19	7.7	9.3	10.4	27.4
Share experiences with friends, family, others	4.05	12.1	14.1	14.0	40.2
For experience of catch	4.00	5.8	6.2	4.8	16.8
For challenge or sport	3.74	5.3	6.0	8.6	19.9
Get away from demands of others	3.48	1.1	5.2	7.2	13.5
For family recreation	3.41	8.4	5.5	2.6	16.5
To experience new and different things	3.35	1.1	1.9	3.5	6.5
To develop skills	3.17	0.2	1.0	1.5	2.7
To catch a “trophy” fish	2.80	1.9	5.0	6.5	13.4
To catch fish to share with other people	2.59	0.9	0.6	1.9	3.4
To obtain fish to eat	2.54	1.4	5.7	2.7	9.8
To test equipment	2.24	0.0	0.2	0.4	0.6
		100.0	100.0	100.0	

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

^bPercentage of anglers for whom the reason was ranked in the top three.

Table 18. Relative importance^a placed on various reasons for going saltwater private boat fishing in Massachusetts, according to specialization level

Reason	Specialization Level			
	Least	Moderately	Very	Most
Relaxation	N/A ^b	4.25	4.41	4.53
Fun of catching fish	N/A	4.19	4.22	4.36
To be outdoors	N/A	4.03	4.25	4.44
To be close to water	N/A	3.97	4.20	4.59
For experience of catch	N/A	3.83	4.06	4.25
Share experiences with friends, family, others	N/A	3.87	4.09	4.34
For challenge or sport	N/A	3.57	3.68	4.31
Get away from demands of others	N/A	3.16	3.66	3.84
To develop skills	N/A	2.94	3.20	3.59
To experience new and different things	N/A	3.34	3.29	3.52
For family recreation	N/A	3.38	3.35	3.52
To catch “trophy” fish	N/A	2.73	2.79	2.96
To catch fish to share with other people	N/A	2.29	2.63	3.10
To obtain fish to eat	N/A	2.16	2.77	2.75
To test equipment	N/A	2.02	2.30	2.58

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

^bN/A = not available, due to sample size being too small for specialization group.

Table 19. Percentage of anglers ranking a reason as one of their top three reasons for going saltwater private boat fishing in Massachusetts, according to specialization level

Reason	Specialization Level			
	Least	Moderately	Very	Most
Relaxation	N/A ^a	63.2	42.7	38.4
Fun of catching fish	N/A	43.7	31.2	34.2
To be outdoors	N/A	37.6	50.9	40.2
To be close to water	N/A	30.8	21.7	35.1
For experience of catch	N/A	12.0	19.6	20.8
Share experiences with friends, family, others	N/A	43.3	35.0	45.0
For challenge or sport	N/A	25.2	16.2	19.5
Get away from demands of others	N/A	9.8	16.5	14.6
To develop skills	N/A	1.9	2.8	4.4
To experience new and different things	N/A	4.4	8.1	6.4
For family recreation	N/A	12.8	19.7	14.3
To catch a “trophy” fish	N/A	8.5	18.4	11.2
To catch fish to share with other people	N/A	1.2	0.7	7.6
To obtain fish to eat	N/A	5.9	13.3	8.3
To test equipment	N/A	0.0	1.2	0.3

^aN/A = not available, due to sample size being too small for specialization group.

Table 20. Extent to which saltwater private boat anglers agreed or disagreed with various catch/retention statements

Statement	Agreement Level (% of anglers)				Relative Agreement ^a	
	Strongly Disagree	Disagree	Neutral	Agree		Strongly Agree
The more fish I catch, the happier I am	3.8	11.4	27.4	47.1	10.4	3.49
A fishing trip can be a success even if no fish are caught	0.6	8.6	15.3	57.7	17.9	3.84
I usually eat the fish I catch	17.0	21.9	13.5	28.8	18.8	3.11
A successful trip is one in which many fish are caught	6.6	29.1	29.1	30.2	5.0	2.98
I would rather catch one or two big fish than 10 smaller fish	2.4	22.1	26.7	31.7	17.2	3.39
When I go fishing, I'm just as happy if I don't catch a fish	6.0	37.6	31.0	19.8	5.6	2.81
It doesn't matter to me what type of fish I catch	4.4	38.4	21.3	33.1	2.9	2.92
The bigger the fish, the better the fishing trip	2.4	27.6	22.0	40.2	7.9	3.24
I'm just as happy if I don't keep the fish I catch	5.8	14.1	18.0	40.8	21.4	3.58

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 21. Relative agreement^a by saltwater private boat anglers with various catch/retention statements, according to specialization level

Statement	Specialization Level			
	Least	Moderately	Very	Most
The more fish I catch, the happier I am	N/A ^b	3.58	3.56	3.28
A fishing trip can be a success even if no fish are caught	N/A	3.81	3.79	3.92
I usually eat the fish I catch	N/A	2.88	3.22	3.22
A successful trip is one in which many fish are caught	N/A	2.93	3.08	2.92
I would rather catch one or two big fish than 10 smaller fish	N/A	3.44	3.26	3.71
When I go fishing, I'm just as happy if I don't catch a fish	N/A	3.01	2.72	2.63
It doesn't matter to me what type of fish I catch	N/A	3.12	2.83	2.64
The bigger the fish, the better the fishing trip	N/A	3.25	3.23	3.35
I'm just as happy if I don't keep the fish I catch	N/A	3.57	3.53	3.69

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 22. Relative importance placed on various reasons for going saltwater shore fishing in Massachusetts

Reason	Importance Level (% of anglers)					Relative Importance ^a
	Not At All	Slightly	Moderately	Very	Extremely	
Relaxation	0.7	2.7	17.1	33.5	46.1	4.22
Fun of catching fish	3.4	3.4	14.2	38.8	40.3	4.09
To be outdoors	1.0	2.4	16.7	46.4	33.6	4.09
To be close to water	3.7	1.5	27.5	32.5	34.8	3.93
For experience of catch	8.6	4.9	22.3	25.9	38.3	3.80
Share experiences with friends, family, others	7.5	5.5	21.4	34.0	31.6	3.77
For challenge or sport	8.0	7.0	25.0	27.5	32.4	3.69
Get away from demands of others	20.1	14.4	15.1	21.5	28.9	3.25
For family recreation	14.6	16.3	21.9	30.4	16.8	3.19
To develop skills	12.4	15.0	34.3	23.9	14.4	3.13
To experience new and different things	11.9	24.0	24.1	24.7	15.33	3.08
To catch a “trophy” fish	30.9	16.3	34.2	7.0	11.6	2.52
To catch fish to share with other people	37.1	21.0	18.7	13.9	9.4	2.38
To test equipment	32.5	34.1	23.2	6.8	3.4	2.15
To obtain fish to eat	43.3	23.8	17.1	6.5	9.3	2.14

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Table 23. Percentage of anglers ranking a reason as first-, second-, or third-most important for going saltwater shore fishing in Massachusetts

Reason	Relative Importance ^a	Rank			Total ^b
		1	2	3	
Relaxation	4.22	21.8	16.9	10.5	49.2
Fun of catching fish	4.09	6.3	20.7	18.6	45.6
To be outdoors	4.09	19.3	9.6	16.9	45.8
To be close to water	3.93	4.5	6.7	8.9	20.1
For experience of catch	3.80	6.2	13.4	4.4	24.0
Share experiences with friends, family, others	3.77	15.4	10.6	7.7	33.7
For challenge or sport	3.69	10.3	3.7	3.6	17.6
Get away from demands of others	3.25	3.5	3.1	5.6	12.2
For family recreation	3.19	6.0	8.6	4.2	18.8
To develop skills	3.13	0.2	0.9	1.8	2.9
To experience new and different things	3.08	2.4	0.2	4.3	6.9
To catch a “trophy” fish	2.52	1.0	2.5	5.3	8.8
To catch fish to share with other people	2.38	0.4	1.9	3.3	5.6
To test equipment	2.15	0.4	0.2	2.0	2.6
To obtain fish to eat	2.14	2.4	1.1	2.8	6.3
		100.0	100.0	100.0	

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

^bPercentage of anglers for whom the reason was ranked in the top three.

Table 24. Relative importance^a placed on various reasons for going saltwater shore fishing in Massachusetts, according to specialization level

Reason	Specialization Level			
	Least	Moderately	Very	Most
Relaxation	N/A ^b	4.01	4.45	4.67
Fun of catching fish	N/A	4.07	4.31	4.56
To be outdoors	N/A	4.00	4.37	4.23
For experience of catch	N/A	3.58	4.34	4.41
To be close to water	N/A	3.69	4.22	4.43
For challenge or sport	N/A	3.37	4.24	4.47
Share experiences with friends, family, others	N/A	3.59	3.88	4.24
Get away from demands of others	N/A	3.18	3.47	4.16
To develop skills	N/A	2.86	3.56	3.93
To experience new and different things	N/A	3.01	3.20	3.55
For family recreation	N/A	3.14	3.28	2.92
To catch “trophy” fish	N/A	2.30	2.83	3.32
To catch fish to share with other people	N/A	2.38	2.59	2.34
To test equipment	N/A	1.91	2.35	2.99
To obtain fish to eat	N/A	2.16	2.01	2.48

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

^bN/A = not available, due to sample size being too small for specialization group.

Table 25. Percentage of anglers ranking a reason as one of their top three reasons for going saltwater shore fishing in Massachusetts, according to specialization level

Reason	Specialization Level			
	Least	Moderately	Very	Most
Relaxation	N/A ^a	49.6	49.5	57.7
Fun of catching fish	N/A	51.9	42.9	27.3
To be outdoors	N/A	41.3	56.7	31.7
For experience of catch	N/A	22.9	28.7	16.1
To be close to water	N/A	24.2	8.5	38.1
For challenge or sport	N/A	15.9	15.6	28.9
Share experiences with friends, family, others	N/A	26.3	38.0	29.5
Get away from demands of others	N/A	12.4	13.9	12.6
To develop skills	N/A	1.1	7.6	0.0
To experience new and different things	N/A	10.5	4.9	2.8
For family recreation	N/A	19.9	10.3	17.3
To catch a “trophy” fish	N/A	6.0	8.6	27.0
To catch fish to share with other people	N/A	9.1	2.9	4.1
To test equipment	N/A	1.4	5.1	1.5
To obtain fish to eat	N/A	7.6	7.0	5.6

^aN/A = not available, due to sample size being too small for specialization group.

Table 26. Extent to which saltwater shore anglers agreed or disagreed with various catch/retention statements

Statement	Agreement Level(% of anglers)				Relative Agreement ^a	
	Strongly Disagree	Disagree	Neutral	Agree		
The more fish I catch, the happier I am	2.1	9.7	23.2	53.1	12.1	3.63
A fishing trip can be a success even if no fish are caught	0.1	5.0	15.1	55.9	23.9	3.99
I usually eat the fish I catch	22.6	16.3	16.7	27.2	17.3	3.00
A successful trip is one in which many fish are caught	5.8	31.5	28.7	30.3	3.7	2.95
I would rather catch one or two big fish than 10 smaller fish	4.5	14.3	27.7	30.8	22.7	3.52
When I go fishing, I'm just as happy if I don't catch a fish	2.5	33.3	24.9	30.4	9.0	3.10
It doesn't matter to me what type of fish I catch	5.6	23.5	25.4	39.2	6.4	3.17
The bigger the fish, the better the fishing trip	4.0	19.7	32.5	30.7	13.0	3.41
I'm just as happy if I don't keep the fish I catch	3.5	5.5	14.0	43.2	33.7	3.98

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 27. Relative agreement^a by saltwater shore anglers with various catch/retention statements, according to specialization level

Statement	Specialization Level			
	Least	Moderately	Very	Most
The more fish I catch, the happier I am	N/A ^b	3.61	3.72	3.53
A fishing trip can be a success even if no fish are caught	N/A	3.92	3.95	4.23
I usually eat the fish I catch	N/A	3.22	2.92	2.91
A successful trip is one in which many fish are caught	N/A	2.90	3.13	3.17
I would rather catch one or two big fish than 10 smaller fish	N/A	3.40	3.59	3.99
When I go fishing, I'm just as happy if I don't catch a fish	N/A	3.00	3.19	3.36
It doesn't matter to me what type of fish I catch	N/A	3.19	3.09	2.75
The bigger the fish, the better the fishing trip	N/A	3.30	3.32	3.41
I'm just as happy if I don't keep the fish I catch	N/A	3.91	4.11	3.59

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 28. Extent to which partyboat anglers agreed or disagreed with various statements on the reasons for not fishing from partyboats in Massachusetts more often

Statement	Agreement Level (% of anglers)				Relative Agreement ^a	
	Strongly Disagree	Disagree	Neutral	Agree		
Resource-Related Reasons						
I can't catch enough keepers to take home	11.9	39.6	28.1	15.5	4.9	2.62
I can't catch enough fish to suit me	11.5	40.3	27.7	16.2	4.3	2.61
I believe an increase in my fishing activity would be bad for the resource	16.9	41.6	31.4	8.3	1.7	2.36
Fishing regulations are too restrictive	15.9	42.9	34.3	5.7	1.2	2.33
I am afraid to eat the fish I catch because of pollutants/contamination	18.5	50.1	22.0	7.9	1.6	2.24
Partyboat-Related Reasons						
Partyboats are too crowded	3.1	22.9	30.6	30.7	12.8	3.27
Partyboat costs are too high	2.8	22.7	41.2	27.9	5.5	3.11
Too far a drive to get to partyboat sites	8.9	35.5	23.3	23.1	9.2	2.88
Partyboats don't target the types of fish I prefer to catch	12.2	46.7	31.7	6.8	2.5	2.41
Other Reasons						
I have too many other demands on my time	5.5	19.5	22.1	39.5	13.4	3.36
Other leisure activities take up my time	5.3	17.8	26.7	42.5	7.8	3.30
It is difficult to find others to fish with me	11.5	46.7	24.2	16.1	1.5	2.49

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 29. Extent to which partyboat anglers agreed or disagreed with various statements on the general level of satisfaction with partyboat fishing in Massachusetts

Statement	Agreement Level(% of anglers)				Relative Agreement ^a
	Strongly Disagree	Disagree	Neutral	Agree	
The partyboat fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	2.6	6.9	21.1	61.3	3.66
I generally get my money's worth when partyboat fishing in Massachusetts	3.8	10.5	28.6	49.5	3.47

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 30. Relative agreement^a by partyboat anglers with various statements on the reasons for not fishing from partyboats in Massachusetts more often, according to specialization level

Statement	Specialization Level				Overall
	Least	Moderately	Very	Most	
Resource-Related Reasons					
I can't catch enough keepers to take home	2.90	2.60	2.48	2.84	2.62
I can't catch enough fish to suit me	2.83	2.58	2.65	2.45	2.61
I believe an increase in my fishing activity would be bad for the resource	2.45	2.36	2.26	2.07	2.36
Fishing regulations are too restrictive	2.65	2.28	2.34	2.55	2.33
I am afraid to eat the fish I catch because of pollutants and contamination	2.41	2.29	2.02	1.79	2.24
Partyboat-Related Reasons					
Partyboats are too crowded	3.31	3.32	3.13	3.28	3.27
Partyboat costs are too high	3.43	3.07	3.02	2.91	3.11
Too far a drive to get to partyboat sites	3.29	2.86	2.79	2.81	2.88
Partyboats don't target the types of fish I prefer to catch	2.70	2.40	2.23	2.04	2.41
Other Reasons					
I have too many other demands on my time	3.56	3.36	3.27	2.82	3.36
Other leisure activities take up my time	3.93	3.22	3.04	2.49	3.30
It is difficult to find others to fish with me	2.88	2.47	2.42	2.28	2.49

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 31. Relative agreement^a by partyboat anglers with various statements on the general level of satisfaction with partyboat fishing in Massachusetts, according to specialization level

Statement	Specialization Level				Overall
	Least	Moderately	Very	Most	
The partyboat fishing opportunities in Massachusetts generally meet my needs for a satisfying experience I generally get my money's worth when I go partyboat fishing in Massachusetts	3.39	3.68	3.68	4.18	3.66
	3.07	3.53	3.52	4.10	3.47
^a Mean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.					

Table 32. Extent to which saltwater private boat anglers agreed or disagreed with various statements on the reasons for not saltwater private boat fishing in Massachusetts more often

Statement	Agreement Level (% of anglers)				Strongly Agree	Relative Agreement ^a
	Strongly Disagree	Disagree	Neutral	Agree		
Resource-Related Reasons						
I can't catch enough keepers to take home	22.0	44.3	19.1	11.5	3.2	2.30
Fishing regulations are too restrictive	17.2	48.3	26.3	7.4	1.0	2.27
I can't catch enough fish to suit me	17.1	54.5	19.7	6.6	2.1	2.22
I am afraid to eat the fish I catch because of pollutants and contamination	23.4	49.3	22.8	3.8	0.7	2.09
I believe an increase in my fishing activity would be bad for the resource	21.8	54.5	19.3	2.9	1.5	2.08
Private-Boat-Related Reasons						
Costs associated with private boat fishing are too high	4.9	37.9	30.2	23.9	3.1	2.82
I don't always have access to a private boat	22.4	31.5	16.3	21.5	8.4	2.62
Too far a drive to get to a marina or launch site	13.0	48.2	19.3	13.2	6.4	2.52
Too much effort to keep boat in good working order	13.6	43.8	33.0	9.1	0.5	2.39
Other Reasons						
I have too many other demands on my time	5.1	18.6	16.6	49.4	10.2	3.41
Other leisure activities take up my time	6.5	27.3	29.3	32.1	4.7	3.01
It is difficult to find others to fish with me	10.3	51.4	17.3	17.5	3.5	2.53

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 33. Extent to which saltwater private boat anglers agreed or disagreed with various statements on the general level of satisfaction with saltwater private boat fishing in Massachusetts

Statement	Agreement Level (% of anglers)					Relative Agreement ^a
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
The saltwater private boat fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	0.6	4.8	12.8	61.5	20.3	3.96
The private boat dockage and launch sites in Massachusetts meet my needs for saltwater fishing	4.4	14.1	21.1	48.9	11.5	3.49

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 34. Relative agreement^a by saltwater private boat anglers with various statements on the reasons for not participating in saltwater private boat fishing in Massachusetts more often, according to specialization level

Statement	Specialization Level				Overall
	Least	Moderately	Very	Most	
Resource-Related Reasons					
I can't catch enough keepers to take home	N/A ^b	2.16	2.43	2.32	2.30
Fishing regulations are too restrictive	N/A	2.34	2.28	2.11	2.27
I can't catch enough fish to suit me	N/A	2.35	2.16	2.19	2.22
I am afraid to eat the fish I catch because of pollutants and contamination	N/A	2.07	2.12	2.05	2.09
I believe an increase in my fishing activity would be bad for the resource	N/A	1.93	2.26	1.92	2.08
Private-Boat-Related Reasons					
Costs associated with private boat fishing are too high	N/A	2.87	2.84	2.75	2.82
I don't always have access to a private boat	N/A	2.97	2.63	1.90	2.62
Too far a drive to get to marina/launch site	N/A	2.52	2.57	2.47	2.52
Too much effort to keep boat in good working order	N/A	2.65	2.32	2.11	2.39
Other Reasons					
I have too many other demands on my time	N/A	3.55	3.42	3.15	3.41
Other leisure activities take up my time	N/A	3.35	2.90	2.55	3.01
It is difficult to find others to fish with me	N/A	2.60	2.57	2.33	2.53

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.
^bN/A = not available, due to sample size being too small for specialization group.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 35. Relative agreement^a by saltwater private boat anglers with various statements on the general level of satisfaction with saltwater private boat fishing in Massachusetts, according to specialization level

Statement	Specialization Level				Overall
	Least	Moderately	Very	Most	
The saltwater private boat fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	N/A ^b	3.89	3.96	4.06	3.96
The private boat dockage and launch sites in Massachusetts meet my needs for saltwater fishing	N/A	3.62	3.42	3.36	3.49

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 36. Extent to which saltwater shore anglers agreed or disagreed with various statements on the reasons for not participating in saltwater shore fishing in Massachusetts more often

Statement	Agreement Level (% of anglers)				Relative Agreement ^a	
	Strongly Disagree	Disagree	Neutral	Agree		
Resource-Related Reasons						
I can't catch enough keepers to take home	25.8	34.1	19.9	16.1	4.1	2.39
I am afraid to eat the fish I catch because of pollutants and contamination	26.6	34.6	26.0	11.3	1.5	2.27
I can't catch enough fish to suit me	23.7	44.7	18.3	11.1	2.2	2.24
Fishing regulations are too restrictive	21.4	50.2	24.0	3.5	0.9	2.12
I believe an increase in my fishing activity would be bad for the resource	28.1	51.4	15.4	3.3	1.8	1.99
Shore-Fishing-Related Reasons						
Shore fishing sites too crowded	7.2	39.7	31.3	18.1	3.7	2.71
Too far a drive to get to shore fishing sites	17.6	40.1	18.0	20.9	3.5	2.52
When fishing from shore, I can't catch the types of fish I prefer to catch	13.9	44.2	28.5	10.9	2.5	2.44
Costs associated with saltwater shore fishing are too high	18.1	44.3	29.9	7.6	0.0	2.27
Other Reasons						
I have too many other demands on my time	4.6	19.1	22.2	38.8	15.4	3.41
Other leisure activities take up my time	8.0	26.8	24.8	33.6	7.0	3.05
It is difficult to find others to fish with me	16.9	51.0	19.7	11.5	0.9	2.29

Mean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 37. Extent to which saltwater shore anglers agreed or disagreed with various statements on the general level of satisfaction with saltwater shore fishing in Massachusetts

Statement	Agreement Level (% of anglers)				Relative Agreement ^a
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The saltwater shore fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	1.0	5.0	21.8	59.0	13.3
3.78					

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 38. Relative agreement^a by saltwater shore anglers with various statements on the reasons for not participating in saltwater shore fishing in Massachusetts more often, according to specialization level

Statement	Specialization Level			Overall	
	Least	Moderately	Very		
Resource-Related Reasons					
I can't catch enough keepers to take home	N/A ^b	2.64	2.03	2.61	2.39
I am afraid to eat the fish I catch because of pollutants and contamination	N/A	2.29	2.38	2.07	2.27
I can't catch enough fish to suit me	N/A	2.42	1.90	2.41	2.24
Fishing regulations are too restrictive	N/A	2.29	1.96	2.15	2.12
I believe an increase in my fishing activity would be bad for the resource	N/A	1.97	1.88	2.49	1.99
Shore-Fishing-Related Reasons					
Shore fishing sites are too crowded	N/A	2.66	2.96	2.84	2.71
Too far a drive to get to shore fishing sites	N/A	2.58	2.48	3.01	2.52
When fishing from shore, I can't catch the types of fish I prefer to catch	N/A	2.58	2.28	2.43	2.44
Costs associated with saltwater shore fishing are too high	N/A	2.29	2.27	2.54	2.27
Other Reasons					
I have too many other demands on my time	N/A	3.39	3.46	3.55	3.41
Other leisure activities take up my time	N/A	3.29	2.71	2.61	3.05
It is difficult to find others to fish with me	N/A	2.47	2.20	2.18	2.29

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 39. Relative agreement^a by saltwater shore anglers with various statements on the general level of satisfaction with saltwater shore fishing in Massachusetts, according to specialization level

Statement	Specialization Level			Overall
	Least	Moderately	Very	
The saltwater shore fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	N/A ^b	3.61	4.04	3.78

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 40. Avidity (given as days fished during previous 12 mo) by partyboat survey anglers, according to water type, fishing mode, and specialization level

Mode	Specialization Level				Overall
	Least	Moderately	Very	Most	
Saltwater Fishing					
Partyboat from Massachusetts	1.0	1.3	2.4	6.6	1.6
Partyboat from another state	0.1	0.3	1.9	6.5	0.7
Charterboat from Massachusetts	0.1	0.1	0.1	0.9	0.1
Private boat leaving from Massachusetts	0.2	0.4	3.8	1.6	1.0
Shore-based fishing in Massachusetts	0.9	1.9	6.3	2.5	2.5
Freshwater Fishing					
Private boat leaving from Massachusetts	2.0	1.8	2.8	0.2	1.9
Private boat leaving from another state	1.8	4.1	7.0	6.7	4.3
Shore-based fishing in Massachusetts	2.3	4.7	4.6	2.5	4.3
Shore-based fishing in another state	4.4	5.4	11.9	14.1	6.7

Table 41. Percentage of saltwater anglers who said they had purchased a freshwater fishing license in their state of residence in 1998, according to saltwater fishing mode and specialization level

Mode	Specialization Level				Overall
	Least	Moderately	Very	Most	
Partyboat	24	36	43	58	35
Private Boat	N/A ^a	41	61	56	52
Shore	N/A	53	61	75	59

^aN/A = not available, due to sample size being too small for specialization group.

Table 42. Percentage of partyboat anglers who said they had taken at least one whale-watching cruise in the past 12 mo, according to specialization level

Mode	Specialization Level				Overall
	Least	Moderately	Very	Most	
Partyboat	28	30	24	15	28

Table 43. Partyboat survey respondent reported trends in Massachusetts fishing avidity, according to water type, fishing mode, and time period. (Trends measured as percentage of anglers reporting a generally decreased, increased, or same number of trips taken.)

Mode	Time Period	Trend			
		Decreased	Increased	Same	No Trips
Saltwater Fishing					
Partyboat	1988-93	7.0	11.3	37.7	44.0
	1994-98	13.2	35.8	43.3	7.8
Charterboat	1988-93	6.4	5.9	19.6	68.0
	1994-98	9.4	10.0	19.7	60.9
Private boat	1988-93	4.8	6.9	14.6	73.7
	1994-98	10.3	11.0	12.8	65.9
Shore	1988-93	5.9	11.9	23.8	58.4
	1994-98	11.7	19.3	21.9	47.2
Freshwater Fishing					
All freshwater modes	1988-93	6.2	9.9	18.4	65.5
	1994-98	12.7	15.2	14.6	57.6

Table 44. Reported trends in Massachusetts fishing avidity, according to water type, fishing mode, and time period, for partyboat anglers reporting a decrease in Massachusetts partyboat trips from 1994 to 1998. (Trends measured as percentage of anglers reporting a generally decreased, increased, or same number of trips taken.)

Mode	Time Period	Trend			
		Decreased	Increased	Same	No Trips
Saltwater Fishing					
Partyboat	1988-93	29.2	37.5	28.6	4.7
Charterboat	1994-98	46.9	2.2	8.7	42.3
Private boat	1994-98	36.4	12.1	10.5	41.0
Shore	1994-98	53.7	13.7	5.7	26.9
Freshwater Fishing					
All freshwater modes	1994-98	36.9	16.3	10.1	36.8

Table 45. Avidity (given as days fished during previous 12 mo) by private boat survey anglers, according to water type, fishing mode, and specialization level

Mode	Specialization Level				Overall
	Least	Moderately	Very	Most	
Saltwater Fishing					
Partyboat from Massachusetts	N/A ^a	0.2	0.3	0.2	0.3
Partyboat from another state	N/A	0.1	1.6	0.5	0.8
Charterboat from Massachusetts	N/A	0.1	0.1	0.2	0.1
Private boat leaving from Massachusetts	N/A	4.6	10.3	21.6	10.3
Shore-based fishing in Massachusetts	N/A	4.3	6.0	8.2	5.9
Freshwater Fishing					
Private boat leaving from Massachusetts	N/A	11.1	4.9	3.8	6.7
Private boat from another state	N/A	5.0	5.6	14.2	6.9
Shore-based fishing in Massachusetts	N/A	4.8	6.0	3.4	5.2
Shore-based fishing in another state	N/A	3.7	2.1	3.8	2.8

^aN/A = not available, due to sample size being too small for specialization group.

Table 46. Private boat survey respondent reported trends in Massachusetts fishing avidity, according to water type, fishing mode, and time period. (Trends measured as percentage of anglers reporting a generally decreased, increased, or same number of trips taken.)

Mode	Time Period	Trend			
		Decreased	Increased	Same	No Trips
Saltwater Fishing					
Partyboat	1988-93	9.5	9.5	21.1	59.9
	1994-98	20.4	5.9	16.2	57.6
Charterboat	1988-93	7.0	12.1	15.9	65.0
	1994-98	13.7	13.6	11.4	61.3
Private boat	1988-93	11.3	32.9	37.0	18.8
	1994-98	8.4	62.7	26.8	2.1
Shore	1988-93	14.7	22.9	31.2	31.3
	1994-98	16.4	34.2	26.6	22.9
Freshwater Fishing					
All freshwater modes	1988-93	8.7	23.9	29.0	38.5
	1994-98	23.0	22.1	20.8	34.2

Table 47. Reported trends in Massachusetts fishing avidity, according to water type, fishing mode, and time period, for private boat anglers reporting a decrease in Massachusetts partyboat trips from 1994 to 1998. (Trends measured as percentage of anglers reporting a generally decreased, increased, or same number of trips taken.)

Mode	Time Period	Trend			
		Decreased	Increased	Same	No Trips
Saltwater Fishing					
Partyboat	1988-93	32.8	28.2	27.2	11.8
Charterboat	1994-98	55.4	10.9	9.9	23.8
Private boat	1994-98	6.0	84.7	8.3	1.0
Shore	1994-98	9.6	59.2	26.1	5.1
Freshwater Fishing					
All freshwater modes	1994-98	40.3	27.4	12.3	20.0

Table 48. Avidity (given as days fished during previous 12 mo) by shore survey anglers, according to water type, fishing mode, and specialization level

Mode	Specialization Level				Overall
	Least	Moderately	Very	Most	
Saltwater Fishing					
Partyboat from Massachusetts	N/A ^a	0.5	0.2	0.6	0.8
Partyboat from another state	N/A	0.1	0.1	1.5	0.4
Charterboat from Massachusetts	N/A	0.1	0.1	0.6	0.2
Private boat leaving from Massachusetts	N/A	2.0	4.3	4.8	2.8
Shore-based fishing in Massachusetts	N/A	4.7	12.2	15.1	8.3
Freshwater Fishing					
Private boat leaving from Massachusetts	N/A	5.0	6.3	1.8	4.5
Private boat leaving from another state	N/A	4.9	9.3	3.3	6.3
Shore-based fishing in Massachusetts	N/A	5.6	9.5	7.1	6.8
Shore-based fishing in another state	N/A	4.9	7.2	4.9	5.5

^aN/A = not available, due to sample size being too small for specialization group.

Table 49. Shore survey respondent reported trends in Massachusetts fishing avidity, according to water type, fishing mode, and time period. (Trends measured as percentage of anglers reporting a generally decreased, increased, or same number of trips taken.)

Mode	Time Period	Trend			
		Decreased	Increased	Same	No Trips
Saltwater Fishing					
Partyboat	1988-93	7.6	3.3	22.9	66.2
	1994-98	16.1	7.1	16.6	60.2
Charterboat	1988-93	7.7	5.9	20.3	66.1
	1994-98	13.3	7.1	22.6	57.0
Private boat	1988-93	6.6	17.3	23.6	52.6
	1994-98	17.2	18.3	21.8	42.7
Shore	1988-93	13.0	21.4	34.8	30.8
	1994-98	17.9	52.1	28.9	1.1
Freshwater Fishing					
All freshwater modes	1988-93	9.2	17.8	32.7	40.4
	1994-98	19.5	17.4	22.0	40.8

Table 50. Reported trends in Massachusetts fishing avidity, according to water type, fishing mode, and time period, for shore anglers reporting a decrease in Massachusetts partyboat trips from 1994 to 1998. (Trends measured as percentage of anglers reporting a generally decreased, increased, or same number of trips taken.)

Mode	Time Period	Trend			
		Decreased	Increased	Same	No Trips
Saltwater Fishing					
Partyboat	1988-93	46.0	8.5	45.6	0.0
Charterboat	1994-98	46.3	1.4	33.1	19.2
Private boat	1994-98	55.9	20.3	11.8	12.1
Shore	1994-98	25.1	60.9	14.0	0.0
Freshwater Fishing					
All freshwater modes	1994-98	51.8	19.6	22.4	6.3

Table 51. Percentage of partyboat anglers ranking a species as first-, second-, or third-most preferred to catch on partyboat fishing trips in Massachusetts

Species	Rank			Total ^a
	1	2	3	
Atlantic cod	27.2	20.6	14.0	61.8
Striped bass	17.7	25.0	14.3	57.0
Bluefish	13.6	20.9	14.0	48.5
Summer flounder	11.1	12.0	18.2	41.3
Black sea bass	1.5	4.7	6.3	12.5
Haddock	8.2	2.4	1.1	11.7
Tautog	0.4	4.3	2.9	7.6
Scup	3.2	1.1	2.0	6.3
No preference	15.6	7.4	23.1	46.1
Other	2.1	1.6	4.1	7.8
		100.0	100.0	100.0

^aPercentage of anglers for whom the species was ranked in the top three.

Table 52. Percentage of partyboat anglers ranking the indicated species as one of the top three species they prefer to catch when partyboat fishing in Massachusetts, according to specialization level

Species	Specialization Level			
	Least	Moderately	Very	Most
Atlantic cod	55.4	62.4	65.9	68.0
Striped bass	60.5	59.4	53.4	27.7
Bluefish	26.9	52.4	52.9	28.5
Summer flounder	44.0	41.5	36.9	23.8
Haddock	3.5	12.5	14.2	13.8
Black sea bass	16.8	10.6	13.7	38.3
Tautog	0.0	5.9	17.3	39.9
Scup	3.5	4.3	12.8	32.0

Table 53. Percentage of Massachusetts partyboat anglers that reported actually targeting the indicated species on partyboat fishing trips from 1996 to 1999 (MRFSS primary target species trips)

Species	Year			
	1996	1997	1998	1999
Atlantic cod	64.5	29.4	16.0	38.4
Striped bass	0.6	2.0	1.9	0.3
Bluefish	7.6	3.5	3.3	2.3
Summer flounder	0.6	3.5	4.4	1.6
Black sea bass	0.6	0.8	0.4	0.7
Haddock	0.4	0.3	1.3	2.0
Tautog	1.6	0.1	0.6	0.4
Scup	2.3	6.4	6.5	9.6
No preference/anything	21.0	52.1	59.5	39.1
Other	0.7	1.9	6.1	5.6

Table 54a. Extent to which partyboat anglers -- both overall and by specialization level -- agreed or disagreed with the given reason why they don't fish from partyboats in Massachusetts more frequently

Reason	Specialization Level	Agreement Level(% of anglers)				Strongly Agree	Relative Agreement ^a
		Strongly Disagree	Disagree	Neutral	Agree		
Partyboats don't target the types of fish that I prefer to catch	Overall	12.2	46.7	31.7	6.8	2.5	2.41
	Least	6.7	26.7	55.6	8.9	2.2	2.73
	Moderate	12.6	45.7	32.7	6.3	2.8	2.41
	Very	18.6	59.3	17.7	4.4	0.0	2.08
	Most	39.3	50.0	5.4	3.6	1.8	1.79

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 54b. Relative importance placed by partyboat anglers -- both overall and by specialization level -- on the given reason for deciding whether to go partyboat fishing in Massachusetts as compared to some other type of fishing they may do in Massachusetts

Reason	Specialization Level	Not At All	Importance Level(% of anglers)			Extremely	Don't Do Any Other Fishing
			Slightly	Moderately	Very		
The types of fish that partyboats target	Overall	18.2	24.4	27.4	19.4	7.4	3.2
	Least	27.2	34.0	7.2	19.3	5.7	6.8
	Moderate	15.3	24.4	32.1	19.1	7.1	2.1
	Very	16.8	17.7	35.2	24.5	5.1	0.7
	Most	15.8	19.1	15.3	9.0	39.6	1.2

Table 54c. Relative importance placed by partyboat anglers -- both overall and by specialization level -- on the given reason for selecting a particular Massachusetts partyboat on which to fish

Reason	Specialization Level	Not At All	Importance Level (% of anglers)			Relative Importance ^a	
			Slightly	Moderately	Very		
The species of fish that the partyboat targets	Overall	22.0	21.5	30.9	19.0	6.6	2.67
	Least	29.8	34.0	23.4	10.6	2.1	2.21
	Moderate	16.3	21.7	31.8	24.4	5.8	2.82
	Very	15.8	16.7	31.6	24.6	11.4	2.99
	Most	16.1	12.5	19.6	26.8	25.0	3.32

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Table 55. Percentage of saltwater private boat anglers ranking a species as first-, second-, or third-most preferred to catch on saltwater private boat fishing trips in Massachusetts

Species	Rank			Total ^a
	1	2	3	
Striped bass	75.9	13.2	7.9	97.0
Bluefish	7.1	50.9	21.9	79.9
Summer flounder	5.6	14.2	19.7	39.5
Atlantic cod	6.0	5.7	11.3	23.0
Atlantic mackerel	1.2	4.2	11.6	17.0
Winter flounder	0.8	4.9	2.4	8.1
Tautog	0.2	2.2	4.1	6.5
No preference	0.6	1.1	16.4	18.1
Other	2.6	3.6	4.7	10.9
	100.0	100.0	100.0	

^aPercentage of anglers for whom the species was ranked in the top three.

Table 56. Percentage of saltwater private boat anglers ranking the indicated species as one of the top three species they prefer to catch when saltwater private boat fishing in Massachusetts, according to specialization level

Species	Specialization Level			
	Least	Moderately	Very	Most
Striped bass	N/A ^a	96.5	98.9	92.1
Bluefish	N/A	87.8	75.9	76.1
Summer flounder	N/A	21.4	52.4	38.7
Atlantic cod	N/A	25.0	21.6	22.4
Atlantic mackerel	N/A	17.6	15.8	19.6
Winter flounder	N/A	5.0	10.4	8.7
Tautog	N/A	4.2	7.4	9.0

^aN/A = not available, due to sample size being too small for specialization group.

Table 57. Percentage of Massachusetts saltwater private boat anglers that reported actually targeting the indicated species on saltwater private boat fishing trips from 1996 to 1999 (MRFSS primary target species trips)

Species	Year			
	1996	1997	1998	1999
Striped bass	52.9	58.4	68.0	61.2
Bluefish	9.0	4.2	5.4	5.3
Summer flounder	3.4	2.9	5.9	3.8
Atlantic cod	18.1	7.7	2.8	3.6
Atlantic mackerel	1.8	4.3	1.5	3.8
Winter flounder	2.3	1.0	1.3	1.2
Tautog	2.2	2.3	0.8	3.6
No preference/anything	4.5	16.6	11.0	13.7
Other	5.8	2.6	3.3	3.8

Table 58. Percentage of saltwater shore anglers ranking a species as first-, second-, or third-most preferred to catch on saltwater shore fishing trips in Massachusetts

Species	Rank			Total ^a
	1	2	3	
Striped bass	70.3	12.6	6.4	89.3
Bluefish	5.4	61.7	15.4	82.5
Summer flounder	6.5	11.0	12.8	30.4
Atlantic mackerel	1.8	2.3	7.2	11.3
Winter flounder	2.9	2.1	3.9	8.9
No preference	7.6	4.4	36.2	48.2
Other	5.3	5.6	14.3	25.2
	100.0	100.0	100.0	

^aPercentage of anglers for whom the species was ranked in the top three.

Table 59. Percentage of saltwater shore anglers ranking the indicated species as one of the top three species they prefer to catch when saltwater shore fishing in Massachusetts, according to specialization level

Species	Specialization Level			
	Least	Moderately	Very	Most
Striped bass	N/A ^a	89.5	90.8	97.5
Bluefish	N/A	75.0	87.9	91.3
Summer flounder	N/A	33.4	20.8	34.1
Atlantic mackerel	N/A	9.1	10.6	11.8
Winter flounder	N/A	12.9	7.4	3.0

^aN/A = not available, due to sample size being too small for specialization group.

Table 60. Percentage of Massachusetts saltwater shore anglers that reported actually targeting the indicated species on saltwater shore fishing trips from 1996 to 1999 (MRFSS primary target species trips)

Species	Year			
	1996	1997	1998	1999
Striped bass	56.2	54.6	64.4	57.5
Bluefish	16.5	8.7	6.6	9.9
Summer flounder	0.9	1.2	1.2	0.9
Atlantic mackerel	2.1	1.1	1.6	0.6
Winter flounder	2.1	1.8	0.7	0.4
No preference/anything	12.7	25.2	22.3	21.8
Other	9.5	7.4	3.2	8.9

Table 61. Total economic impacts generated from recreational fishing expenditures by geographical location and fishing mode in 1998

Impact Location	Fishing Mode	Total Expenditures (\$000s)	Impact		
			Sales (\$000s)	Income (\$000s)	Employment (jobs)
Massachusetts	Partyboat	4,486	6,924	2,746	142
	Private boat	190,912	197,006	79,134	2,999
	Shore	121,256	146,012	60,192	2,477
	Total	316,654	349,942	142,072	5,618
Zone 1	Partyboat	2,039	3,109	1,247	60
	Private boat	146,730	150,837	61,183	2,205
	Shore	98,379	112,892	47,094	1,840
	Total	247,148	266,838	109,524	4,105
Zone 2	Partyboat	2,221	3,091	1,225	67
	Private boat	37,095	37,572	14,871	569
	Shore	19,257	19,378	8,102	340
	Total	58,573	60,041	24,198	976

Table 62. Economic impacts generated from partyboat fishing expenditures in Massachusetts in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			Total
		Direct	Indirect	Induced	
Sales (\$000s)					
Automobile	399	118	31	54	202
Bait and tackle	171	88	20	43	151
Restaurant	634	634	221	269	1,124
Groceries	355	85	18	46	148
Lodging	781	781	275	328	1,384
Parking	55	55	16	24	95
Partyboat fees	2,016	2,016	791	878	3,685
Rod rental	74	74	29	32	135
Total	4,485	3,851	1,401	1,674	6,924
Income (\$000s)					
Automobile	399	53	13	21	87
Bait and tackle	171	45	8	17	69
Restaurant	634	255	76	107	437
Groceries	355	48	7	18	73
Lodging	781	307	111	130	547
Parking	55	24	6	10	40
Partyboat fees	2,016	776	316	348	1,440
Rod rental	74	29	12	13	53
Total	4,485	1,537	546	664	2,746
Employment(jobs)					
Automobile	399	1	0	1	2
Bait and tackle	171	2	0	1	3
Restaurant	634	17	2	4	23
Groceries	355	3	0	1	4
Lodging	781	11	3	4	18
Parking	55	1	0	0	1
Partyboat fees	2,016	68	9	11	88
Rod rental	74	3	0	0	3
Total	4,485	106	14	22	142

Table 63. Economic impacts generated from saltwater shore fishing expenditures in Massachusetts in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			Total
		Direct	Indirect	Induced	
Sales (\$000s)					
Automobile	16,812	4,867	1,310	2,262	8,439
Bait and tackle	21,985	11,278	2,519	5,562	19,359
Restaurant	25,409	25,409	8,845	10,790	45,043
Groceries	20,823	4,998	1,032	2,669	8,699
Lodging	28,681	28,681	10,106	12,049	50,837
Parking	1,236	1,236	359	545	2,140
Site entrance fee	4,588	4,588	1,801	1,997	8,386
Public transportation	1,722	1,722	405	983	3,110
Total	121,256	82,778	26,376	36,857	146,012
Income (\$000s)					
Automobile	16,812	2,221	526	898	3,645
Bait and tackle	21,985	5,711	982	2,206	8,899
Restaurant	25,409	10,211	3,032	4,280	17,523
Groceries	20,823	2,808	388	1,059	4,255
Lodging	28,681	11,254	4,059	4,779	20,092
Parking	1,236	545	126	216	887
Site entrance fee	4,588	1,767	719	792	3,278
Public transportation	1,722	1,052	171	390	1,612
Total	121,256	35,568	10,003	14,621	60,192
Employment (jobs)					
Automobile	16,812	58	13	29	100
Bait and tackle	21,985	216	25	71	312
Restaurant	25,409	667	82	139	888
Groceries	20,823	155	10	34	199
Lodging	28,681	407	117	155	679
Parking	1,236	26	4	7	37
Site entrance fee	4,588	156	20	26	202
Public transportation	1,722	43	4	13	60
Total	121,256	1,728	275	474	2,477

Table 64. Economic impacts generated from saltwater private boat fishing expenditures in Massachusetts in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			
		Direct	Indirect	Induced	Total
Sales (\$000s)					
Automobile	25,130	7,276	1,959	3,381	12,617
Bait and tackle	32,926	16,891	3,773	8,328	28,993
Boat fuel	37,490	10,855	2,922	5,044	18,821
Restaurant	30,321	30,321	10,556	12,874	53,750
Groceries	24,917	5,980	1,235	3,194	10,408
Lodging	26,651	26,651	9,391	11,194	47,236
Parking	1,102	1,102	320	486	1,908
Launch fee/docking	11,343	11,343	6,547	3,520	21,410
Public transportation	1,031	1,031	242	589	1,862
Total	190,912	111,451	36,946	48,609	197,006
Income (\$000s)					
Automobile	25,130	3,320	786	1,343	5,449
Bait and tackle	32,926	8,553	1,471	3,304	13,328
Boat fuel	37,490	4,953	1,173	2,003	8,129
Restaurant	30,321	12,185	3,619	5,107	20,910
Groceries	24,917	3,360	465	1,267	5,092
Lodging	26,651	10,458	3,772	4,440	18,670
Parking	1,102	486	113	193	791
Launch fee/docking	11,343	1,967	2,436	1,396	5,799
Public transportation	1,031	630	102	233	966
Total	190,912	45,912	13,936	19,285	79,134
Employment (jobs)					
Automobile	25,130	86	20	44	150
Bait and tackle	32,926	323	38	107	468
Boat fuel	37,490	128	30	65	223
Restaurant	30,321	796	97	166	1,059
Groceries	24,917	185	12	41	238
Lodging	26,651	378	109	144	631
Parking	1,102	24	3	6	33
Launch fee/docking	11,343	54	62	45	161
Public transportation	1,031	25	3	8	36
Total	190,912	1,999	374	626	2,999

Table 65. Economic impacts generated from partyboat fishing expenditures in Zone 1 in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			Total
		Direct	Indirect	Induced	
Sales (\$000s)					
Automobile	174	54	17	24	95
Bait and tackle	60	31	7	15	53
Restaurant	325	325	108	136	569
Groceries	178	43	9	22	74
Lodging	470	470	160	194	824
Parking	41	41	12	18	71
Partyboat fees	765	765	295	318	1,378
Rod rental	26	26	10	11	46
Total	2,039	1,756	616	737	3,109
Income (\$000s)					
Automobile	174	23	7	10	39
Bait and tackle	60	16	3	6	24
Restaurant	325	135	38	55	227
Groceries	178	24	3	9	37
Lodging	470	190	65	79	334
Parking	41	18	4	7	30
Partyboat fees	765	290	120	129	538
Rod rental	26	10	4	4	18
Total	2,039	705	243	298	1,247
Employment(jobs)					
Automobile	174	1	0	0	1
Bait and tackle	60	1	0	0	1
Restaurant	325	8	1	2	11
Groceries	178	1	0	0	1
Lodging	470	6	2	3	11
Parking	41	1	0	0	1
Partyboat fees	765	26	3	4	33
Rod rental	26	1	0	0	1
Total	2,039	45	6	9	60

Table 66. Economic impacts generated from saltwater shore fishing expenditures in Zone 1 in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			
		Direct	Indirect	Induced	Total
Sales (\$000s)					
Automobile	13,389	4,181	1,275	1,810	7,266
Bait and tackle	19,112	7,363	1,640	3,429	12,433
Restaurant	20,979	20,979	6,932	8,748	36,658
Groceries	16,680	4,003	814	2,082	6,899
Lodging	22,699	22,699	7,725	9,387	39,812
Parking	1,004	1,004	289	429	1,721
Site entrance fee	2,888	2,888	1,112	1,201	5,201
Public transportation	1,629	1,629	366	907	2,902
Total	98,379	64,746	20,152	27,993	112,892
Income (\$000s)					
Automobile	13,389	1,767	508	733	3,008
Bait and tackle	19,112	3,618	648	1,388	5,654
Restaurant	20,979	8,676	2,417	3,541	14,634
Groceries	16,680	2,230	311	843	3,383
Lodging	22,699	9,204	3,128	3,800	16,132
Parking	1,004	443	103	174	719
Site entrance fee	2,888	1,093	452	486	2,031
Public transportation	1,629	1,008	158	367	1,533
Total	98,379	28,038	7,723	11,332	47,094
Employment (jobs)					
Automobile	13,389	46	13	23	82
Bait and tackle	19,112	132	16	44	192
Restaurant	20,979	530	63	111	704
Groceries	16,680	120	8	26	154
Lodging	22,699	293	87	119	499
Parking	1,004	21	3	6	30
Site entrance fee	2,888	97	12	15	124
Public transportation	1,629	39	4	12	55
Total	98,379	1,278	206	356	1,840

Table 67. Economic impacts generated from saltwater private boat fishing expenditures in Zone 1 in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			Total
		Direct	Indirect	Induced	
Sales (\$000s)					
Automobile	18,915	5,908	1,802	2,557	10,268
Bait and tackle	25,836	13,548	2,973	6,437	22,958
Boat fuel	30,517	9,518	2,900	4,121	16,539
Restaurant	22,565	22,565	7,456	9,410	39,431
Groceries	19,014	4,563	928	2,373	7,865
Lodging	19,686	19,686	6,700	8,140	34,525
Parking	620	620	178	265	1,063
Launch fee/docking	8,588	8,588	5,191	2,647	16,425
Public transportation	990	990	222	551	1,762
Total	146,730	85,986	28,351	36,500	150,837
Income (\$000s)					
Automobile	18,915	2,497	718	1,036	4,250
Bait and tackle	25,836	6,830	1,176	2,606	10,612
Boat fuel	30,517	4,026	1,129	1,669	6,824
Restaurant	22,565	9,332	2,600	3,809	15,741
Groceries	19,014	2,583	354	961	3,898
Lodging	19,686	7,982	2,713	3,295	13,990
Parking	620	274	63	107	444
Launch fee/docking	8,588	1,515	1,908	1,072	4,495
Public transportation	990	612	96	223	931
Total	146,730	35,651	10,755	14,777	61,184
Employment(jobs)					
Automobile	18,915	65	18	33	116
Bait and tackle	25,836	251	29	82	362
Boat fuel	30,517	105	29	52	186
Restaurant	22,565	570	68	120	758
Groceries	19,014	137	9	30	176
Lodging	19,686	254	75	104	433
Parking	620	13	2	3	18
Launch fee/docking	8,588	41	49	34	124
Public transportation	990	23	2	7	32
Total	146,730	1,459	281	465	2,205

Table 68. Economic impacts generated from partyboat fishing expenditures in Zone 2 in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			Total
		Direct	Indirect	Induced	
Sales (\$000s)					
Automobile	255	73	22	30	125
Bait and tackle	65	8	2	3	13
Restaurant	243	243	75	90	408
Groceries	235	56	11	26	94
Lodging	199	199	66	72	338
Parking	936	936	257	361	2
Partyboat fees	1,195	1,195	419	451	2,064
Rod rental	28	28	10	11	48
Total	2,221	1,804	604	683	3,091
Income (\$000s)					
Automobile	255	33	8	12	52
Bait and tackle	65	4	2	3	9
Restaurant	243	98	26	35	160
Groceries	235	32	4	10	46
Lodging	199	76	27	28	131
Parking	936	411	89	141	641
Partyboat fees	1,195	469	162	177	807
Rod rental	28	11	4	4	19
Total	2,221	723	232	270	1,225
Employment(jobs)					
Automobile	255	1	0	0	1
Bait and tackle	65	0	0	0	0
Restaurant	243	6	1	1	8
Groceries	235	2	0	0	2
Lodging	199	3	1	1	5
Parking	936	0	0	0	0
Partyboat fees	1,195	39	5	6	50
Rod rental	28	1	0	0	1
Total	2,221	52	7	8	67

Table 69. Economic impacts generated from saltwater shore fishing expenditures in Zone 2 in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			
		Direct	Indirect	Induced	Total
Sales (\$000s)					
Automobile	3,253	935	243	378	1,556
Bait and tackle	5,464	2,577	536	1,141	4,253
Restaurant	3,564	3,564	1,091	1,319	5,974
Groceries	3,272	785	153	369	1,307
Lodging	2,382	2,382	790	862	4,034
Parking	457	457	126	176	759
Site entrance fee	866	866	303	327	1,495
Public transportation	0	0	0	0	0
Total	19,257	11,565	3,243	4,571	19,378
Income (\$000s)					
Automobile	3,253	419	97	148	664
Bait and tackle	5,464	1,336	208	447	1,991
Restaurant	3,564	1,440	381	517	2,337
Groceries	3,272	440	57	145	641
Lodging	2,382	914	319	338	1,571
Parking	457	201	43	69	313
Site entrance fee	866	340	117	128	585
Public transportation	0	0	0	0	0
Total	19,257	5,088	1,223	1,791	8,102
Employment (jobs)					
Automobile	3,253	10	3	5	18
Bait and tackle	5,464	49	5	14	68
Restaurant	3,564	93	10	17	120
Groceries	3,272	24	2	5	31
Lodging	2,382	36	9	11	56
Parking	457	9	1	2	12
Site entrance fee	866	28	3	4	35
Public transportation	0	0	0	0	0
Total	19,257	249	33	58	340

Table 70. Economic impacts generated from saltwater private boat fishing expenditures in Zone 2 in 1998

Expenditure Category	Total Expenditures (\$000s)	Impacts			
		Direct	Indirect	Induced	Total
Sales (\$000s)					
Automobile	6,055	1,741	453	703	2,896
Bait and tackle	6,541	3,085	642	1,365	5,092
Boat fuel	9,616	2,765	719	1,116	4,600
Restaurant	6,808	6,808	2,084	2,519	11,410
Groceries	302	302	59	142	503
Lodging	5,324	5,324	1,766	1,927	9,018
Parking	196	196	54	76	325
Launch fee/docking	2,254	2,254	957	518	3,728
Public transportation	0	0	0	0	0
Total	37,095	22,473	6,734	8,365	37,572
Income (\$000s)					
Automobile	6,055	780	181	276	1,237
Bait and tackle	6,541	1,600	249	535	2,383
Boat fuel	9,616	1,239	287	438	1,964
Restaurant	6,808	2,750	728	987	4,464
Groceries	302	169	22	56	247
Lodging	5,324	2,042	714	755	3,512
Parking	196	86	19	30	134
Launch fee/docking	2,254	351	378	203	931
Public transportation	0	0	0	0	0
Total	37,095	9,017	2,577	3,278	14,871
Employment (jobs)					
Automobile	6,055	19	5	9	33
Bait and tackle	6,541	58	7	18	83
Boat fuel	9,616	30	7	14	51
Restaurant	6,808	178	20	32	230
Groceries	302	9	1	2	12
Lodging	5,324	80	21	25	126
Parking	196	4	1	1	6
Launch fee/docking	2,254	11	10	7	28
Public transportation	0	0	0	0	0
Total	37,095	389	72	108	569

Table 71. Percentage of anglers, by fishing mode and residence, that supported or opposed a Massachusetts saltwater fishing license

Mode	Residence	Level of Support (% of anglers)			
		Oppose Altogether	Support without a Fee	Support with a Fee	No Opinion
Partyboat	Massachusetts	54.3	15.0	12.5	18.2
	Out-of-state	58.1	7.8	7.1	27.0
	Combined	56.6	11.4	9.9	22.1
Private boat	Massachusetts	70.0	12.8	13.9	3.4
	Out-of-state	77.5	8.3	11.1	3.1
	Combined	72.7	11.3	12.8	3.2
Shore	Massachusetts	76.6	11.3	7.8	4.2
	Out-of-state	74.1	2.3	19.2	4.4
	Combined	75.1	8.3	12.2	4.3

Table 72. Percentage of anglers, by fishing mode and specialization level, that supported or opposed a Massachusetts saltwater fishing license. (Responses of “No Opinion” were not included in this analysis.)

Mode	Specialization Level	Level of Support (% of anglers)		
		Oppose Altogether	Support without a Fee	Support with a Fee
Partyboat	Least	65.5	24.1	10.3
	Moderate	72.3	14.2	13.6
	Very	76.4	12.2	11.4
	Most	83.0	9.8	7.2
Private boat	Least	N/A ^a	N/A	N/A
	Moderate	76.2	15.6	8.2
	Very	76.0	5.9	18.1
	Most	70.8	17.0	12.3
Shore	Least	N/A	N/A	N/A
	Moderate	81.2	8.6	10.2
	Very	74.3	8.4	17.3
	Most	76.0	15.5	8.6

^aN/A = not available, due to sample size being too small for specialization group.

Table 73. Extent to which anglers, by fishing mode and specialization level, agreed or disagreed with the given statement as to why they don't saltwater fish from partyboats/private boats/shore in Massachusetts more frequently

Statement	Mode	Specialization Level	Agreement Level (% of anglers)					Relative Agreement ^a
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Fishing regulations are too restrictive	Partyboat	Overall	15.9	42.9	34.3	5.7	1.2	2.33
		Least	10.9	21.7	58.7	6.5	2.2	2.67
		Moderate	15.1	48.5	30.2	5.0	1.2	2.29
		Very	15.2	43.8	26.8	9.8	4.5	2.44
		Most	27.3	43.6	9.1	10.9	9.1	2.31
	Private boat	Overall	17.2	48.3	26.3	7.4	1.0	2.27
		Least	N/A ^b	N/A	N/A	N/A	N/A	N/A
		Moderate	8.9	53.2	30.4	6.3	1.3	2.38
		Very	17.2	54.2	20.8	6.8	1.0	2.20
		Most	28.0	44.1	16.8	8.7	2.5	2.14
Shore	Shore	Overall	21.4	50.2	24.0	3.5	0.9	2.12
		Least	N/A	N/A	N/A	N/A	N/A	N/A
		Moderate	11.6	52.2	31.9	1.5	2.9	2.32
		Very	24.5	55.7	15.1	1.9	2.8	2.03
		Most	27.6	48.3	12.1	10.3	1.7	2.10

^aMean score based on five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

^bN/A = not available, due to sample size being too small for specialization group.

Table 74. Extent to which party/boat anglers supported or opposed various management tools for Massachusetts' recreational saltwater fisheries. (See Appendix A1, Questions 40a-h, for full wording of management tools.)

Management Tool	Strongly Support	Support Level (% of anglers)				Relative Support ^a
		Support	Neutral	Somewhat Oppose	Strongly Oppose	
Minimum size limits	68.1	24.2	3.7	1.5	1.7	1.43
Slot limits	31.3	25.1	16.4	12.9	10.9	2.45
Daily bag limits	44.0	28.1	10.1	10.1	7.2	2.08
Seasonal restrictions	43.9	30.6	11.4	8.1	4.8	1.98
Prohibiting the sale of fish by recreational anglers	27.2	18.4	25.4	13.8	12.9	2.66
Not allowing the harvest of striped bass in federal waters (EEZ)	18.8	11.6	33.4	9.6	14.1	2.87
Increasing the minimum size limit, while also increasing the daily bag limit, of a given species	9.9	20.7	32.5	15.8	14.4	3.05
Decreasing the minimum size limit, while also decreasing the daily bag limit, of a given species	7.8	9.5	33.9	22.0	17.7	3.36

^aMean score based on five-point scale: 1 = strongly support, 2 = support, 3 = neutral, 4 = somewhat oppose, 5 = strongly oppose. Responses of "Don't Know" were not included in calculation of means.

Table 75. Relative support^a by partyboat anglers for various management tools for Massachusetts' recreational saltwater fisheries, according to specialization level

Management Tool	Specialization Level			
	Least	Moderately	Very	Most
Minimum size limits	1.52	1.48	1.51	1.08
Slot limits	2.55	2.57	2.59	2.08
Daily bag limits	2.07	2.11	2.06	2.50
Seasonal restrictions	1.95	2.07	1.97	2.76
Prohibiting the sale of fish by recreational anglers	2.85	2.69	2.89	2.63
Not allowing the harvest of striped bass in federal waters (EEZ)	3.18	3.24	3.32	3.99
Increasing the minimum size limit, while also increasing the daily bag limit, of a given species	3.46	3.16	3.32	2.95
Decreasing the minimum size limit, while also decreasing the daily bag limit, of a given species	3.44	3.58	3.69	4.41

^aMean score based on five-point scale: 1 = strongly support, 2 = support, 3 = neutral, 4 = somewhat oppose, 5 = strongly oppose. Responses of "Don't Know" were not included in calculation of means.

Table 76. Extent to which private boat anglers supported or opposed various management tools for Massachusetts' recreational saltwater fisheries. (See Appendix A2, Questions 40a-h, for full wording of management tools.)

Management Tool	Support Level (% of anglers)					Relative Support ^a
	Strongly Support	Support	Neutral	Somewhat Oppose	Strongly Oppose	
Minimum size limits	79.4	15.8	1.2	1.1	0.0	1.22
Slot limits	44.4	25.2	10.3	10.4	7.4	2.09
Daily bag limits	68.0	21.2	2.5	3.5	4.3	1.54
Seasonal restrictions	50.9	19.5	13.4	11.6	4.0	1.98
Prohibiting the sale of fish by recreational anglers	47.5	9.1	16.0	12.1	14.7	2.37
Not allowing the harvest of striped bass in federal waters (EEZ)	28.4	8.1	21.9	6.2	30.7	3.03
Increasing the minimum size limit, while also increasing the daily bag limit, of a given species	11.1	19.6	23.6	25.2	17.2	3.18
Decreasing the minimum size limit, while also decreasing the daily bag limit, of a given species	7.0	15.1	31.1	19.3	23.7	3.39

^aMean score based on five-point scale: 1 = strongly support, 2 = support, 3 = neutral, 4 = somewhat oppose, 5 = strongly oppose. Responses of "Don't Know" were not included in calculation of means.

Table 77. Relative support^a by private boat anglers for various management tools for Massachusetts' recreational saltwater fisheries, according to specialization level

Management Tool	Specialization Level			
	Least	Moderately	Very	Most
Minimum size limits	N/A ^b	1.40	1.38	1.17
Slot limits	N/A	2.04	2.32	2.20
Daily bag limits	N/A	1.59	1.53	1.68
Seasonal restrictions	N/A	2.05	2.02	1.86
Prohibiting the sale of fish by recreational anglers	N/A	2.64	2.13	2.53
Not allowing the harvest of striped bass in federal waters (EEZ)	N/A	3.09	3.28	3.02
Increasing the minimum size limit, while also increasing the daily bag limit, of a given species	N/A	3.21	3.38	3.22
Decreasing the minimum size limit, while also decreasing the daily bag limit, of a given species	N/A	3.60	3.45	3.49

^aMean score based on five-point scale: 1 = strongly support, 2 = support, 3 = neutral, 4 = somewhat oppose, 5 = strongly oppose. Responses of "Don't Know" were not included in calculation of means.

^bN/A = not available, due to sample size being too small for specialization group.

Table 78. Extent to which shore anglers supported or opposed various management tools for Massachusetts' recreational saltwater fisheries. (See Appendix A3, Questions 40a-h, for full wording of management tools.)

Management Tool	Support Level (% of anglers)					Relative Support ^a
	Strongly Support	Support	Neutral	Somewhat Oppose	Strongly Oppose	
Minimum size limits	81.3	8.2	5.2	4.4	0.3	1.33
Slot limits	44.0	27.9	13.2	8.4	4.5	2.00
Daily bag limits	65.0	22.2	8.8	0.7	3.3	1.55
Seasonal restrictions	48.5	27.0	16.4	3.9	1.9	1.81
Prohibiting the sale of fish by recreational anglers	45.4	19.7	19.9	8.6	5.8	2.09
Not allowing the harvest of striped bass in federal waters (EEZ)	30.6	5.8	29.9	8.0	18.4	2.76
Increasing the minimum size limit, while also increasing the daily bag limit, of a given species	7.4	19.6	32.8	18.5	18.0	3.21
Decreasing the minimum size limit, while also decreasing the daily bag limit, of a given species	7.7	18.3	35.4	10.6	24.5	3.27

^aMean score based on five-point scale: 1 = strongly support, 2 = support, 3 = neutral, 4 = somewhat oppose, 5 = strongly oppose. Responses of "Don't Know" were not included in calculation of means.

Table 79. Relative support^a by shore anglers for various management tools for Massachusetts' recreational saltwater fisheries, according to specialization level

Management Tool	Specialization Level			
	Least	Moderately	Very	Most
Minimum size limits	N/A ^b	1.35	1.29	1.15
Slot limits	N/A	2.16	2.09	1.98
Daily bag limits	N/A	1.73	1.30	1.16
Seasonal restrictions	N/A	2.08	1.89	1.38
Prohibiting the sale of fish by recreational anglers	N/A	2.18	2.29	1.81
Not allowing the harvest of striped bass in federal waters (EEZ)	N/A	2.84	3.64	2.62
Increasing the minimum size limit, while also increasing the daily bag limit, of a given species	N/A	3.04	3.73	3.27
Decreasing the minimum size limit, while also decreasing the daily bag limit, of a given species	N/A	3.04	3.86	2.74

^aMean score based on five-point scale: 1 = strongly support, 2 = support, 3 = neutral, 4 = somewhat oppose, 5 = strongly oppose. Responses of "Don't Know" were not included in calculation of means.

^bN/A = not available, due to sample size being too small for specialization group.

Table 80. Relative importance placed on various items to partyboat anglers in their selection of a particular Massachusetts partyboat on which to fish

Item	Not At All	Importance Level (% of anglers)			Extremely	Relative Importance ^a
		Slightly	Moderately	Very		
Courteous and helpful crew	2.5	7.5	23.3	50.3	16.4	3.71
Previous personal experience	8.6	12.7	28.9	38.5	11.3	3.31
Cost of boat fees	6.9	17.0	32.7	31.3	12.1	3.25
Size of boat	7.2	15.4	39.4	29.8	8.1	3.16
Word of mouth	8.9	15.7	37.3	31.2	6.8	3.11
Captain's reputation	12.7	17.3	29.3	29.5	11.3	3.10
Comfort features on the boat	8.4	22.1	40.7	24.0	4.7	2.95
Number fish typically caught	16.5	20.9	31.9	25.1	5.6	2.82
Distance from home to port	18.7	22.7	32.4	18.4	7.8	2.74
Species of fish that boat targets	22.0	21.5	30.9	19.0	6.6	2.67
Size of fish typically caught	19.1	26.7	30.7	19.5	4.0	2.63
Saw advertisement in paper or magazine	31.1	23.9	29.2	12.6	3.3	2.33

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Table 81. Relative importance^a placed on various items to partyboat anglers in their selection of a particular Massachusetts partyboat on which to fish, according to specialization level

Item	Specialization Level			
	Least	Moderately	Very	Most
Courteous and helpful crew	3.48	3.72	3.92	3.97
Previous personal experience	2.83	3.32	3.73	4.13
Cost of boat fees	3.53	3.18	3.32	2.98
Size of boat	3.07	3.15	3.31	3.66
Word of mouth	2.92	3.13	3.27	3.45
Captain's reputation	2.70	3.01	3.71	4.17
Comfort features on the boat	2.89	2.98	2.85	3.48
Number of fish typically caught	2.47	2.85	2.95	3.46
Distance from home to port	2.95	2.71	2.73	2.46
Species of fish that boat targets	2.23	2.68	2.92	3.62
Size of fish typically caught	2.08	2.66	2.92	3.44
Saw advertisement in paper or magazine	2.31	2.35	2.40	2.27

^aMean score based on five-point scale: 1 = not at all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important.

Appendix A1. Socio-economic mail survey questionnaire of Massachusetts partyboat anglers.

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In the following questions, please tell us about your fishing activity and experience. "Shore" fishing can include fishing from a beach, bank, jetty, pier, dock, bridge, break-water, causeway or wading in water. For the purposes of this survey, "partyboat" is defined as any boat where people pay per person to go fishing. A "charterboat" is a boat which a group of people have paid a flat fee for use of the entire boat for a period of time.

1. What year did you first start fishing in saltwater?
19_____
2. What year did you first start fishing from *partyboats* in saltwater?
19_____
3. In the past 12 months, how many *days* did you go saltwater fishing from:

_____ DAYS	A PARTYBOAT IN MASSACHUSETTS
_____ DAYS	A PARTYBOAT IN ANOTHER STATE
_____ DAYS	A CHARTERBOAT IN MASSACHUSETTS
_____ DAYS	A PRIVATELY OWNED BOAT IN MASSACHUSETTS
_____ DAYS	THE SHORE IN MASSACHUSETTS (includes beach, bank, pier, jetty, dock, bridge)
4. Which of the following types of *partyboat fishing* trips did you take in Massachusetts in the past 12 months? (You may circle more than one type)
 - 1 HALF DAY TRIP (about 4 hours)
 - 2 FULL DAY TRIP (about 8 hours)
 - 3 EVENING/NIGHT TRIP
 - 4 OVERNIGHT TRIP
5. In the past 12 months, how many times did you go on a whale watching cruise?
_____ TIMES
6. In the past 12 months, did you fish in freshwater?
 - 1 YES (*If yes, go to question 7*)
 - 2 NO (*If no, skip to question 8*)

7. In the past 12 months, how many *days* did you go *freshwater* fishing from:

- _____ DAYS A PRIVATELY OWNED BOAT IN MASSACHUSETTS
- _____ DAYS A PRIVATELY OWNED BOAT IN ANOTHER STATE
- _____ DAYS THE SHORE IN MASSACHUSETTS
- _____ DAYS THE SHORE IN ANOTHER STATE

Next we would like some more detailed information about your fishing skill level and the importance of fishing in your life.

8. Please fill in the appropriate letter, from the list provided, of the fish species you most prefer to catch on *partyboat trips* in Massachusetts:

- _____ Most Preferred
- _____ Second Most Preferred
- _____ Third Most Preferred

- | | |
|----------------------------|--------------------|
| a) summer flounder (fluke) | f) bluefish |
| b) scup (porgy) | g) striped bass |
| c) black sea bass | h) Atlantic cod |
| d) tautog (blackfish) | i) other (specify) |
| e) striped bass | j) no preference |

9. When I participate in the sport of partyboat fishing I feel like:
(Please circle only one number)

- 1 an outsider. I am uncomfortable when I go partyboat fishing, and I don't really feel like I am part of the fishing scene.
- 2 an observer or irregular participant. Sometimes it is fun, entertaining or rewarding to go partyboat fishing.
- 3 a habitual and regular participant in the sport of partyboat fishing.
- 4 an insider to the sport. Partyboat fishing is an important part of who I am.

10. During a partyboat fishing experience, I can best be described as:**(Please circle only one number)**

- 1 being somewhat uncertain. I am unsure about what I can or cannot do while partyboat fishing, or how to do it.
- 2 having some understanding of partyboat fishing, but still in the process of learning more about partyboat fishing. I am becoming more familiar and comfortable with partyboat fishing.
- 3 becoming comfortable with the sport. I have regular, routine, and predictable experiences. I have a good understanding of what I can do while partyboat fishing, and how to do it.
- 4 a knowledgeable expert in the sport and/or someone who is comfortable encouraging, teaching and enhancing opportunities for others who are interested in partyboat fishing.

11. My *relationships* with other partyboat anglers are: (Please circle only one number)

- 1 not established. I really don't know any other partyboat anglers.
- 2 very limited. I know some other partyboat anglers by sight and sometimes talk with them, but I don't know their names.
- 3 one of familiarity. I know the names of other partyboat anglers, and often speak with them.
- 4 close. I have personal and close friendships with other partyboat anglers. These friendships often revolve around partyboat fishing.

12. My *commitment* to partyboat fishing is: (Please circle only one number)

- 1 almost nonexistent. I basically don't care whether or not I continue to go partyboat fishing.
- 2 moderate. I will continue to go partyboat fishing as long as it is entertaining and provides the benefits I want.
- 3 fairly strong. I have a sense of being a member of the activity, and it is likely I will continue to fish from partyboats for a long time.
- 4 very strong. I am totally committed to partyboat fishing. I encourage others to go partyboat fishing, and seek to ensure the activity continues into the future.

13. What type of group do you go partyboat fishing with *most often*?
(Please circle only one number)

- 1 BY YOURSELF
- 2 FAMILY
- 3 FRIENDS
- 4 CO-WORKERS
- 5 OTHER (specify) _____

14. Who first introduced you to partyboat fishing? (Please circle only one number)

- | | |
|------------------|--------------------------|
| 1 YOURSELF | 6 GRANDPARENTS |
| 2 FATHER | 7 OTHER CLOSE RELATIVE |
| 3 MOTHER | 8 FRIEND |
| 4 SPOUSE | 9 CO-WORKER |
| 5 BROTHER/SISTER | 10 OTHER (specify) _____ |

The following questions will be used to perform an economic analysis of partyboat fishing in Massachusetts. The information you provide will remain strictly confidential and you will not be identified with your answers. Please refer to the *enclosed map* of Massachusetts to answer zone specific questions in this section.

Questions 15-23 Relate Only to Zone 1 Partyboat Fishing
(please refer to enclosed map)

15. In the past 12 months, how many *days* did you go partyboat fishing from a partyboat that left from *Zone 1*? (see map, Zone 1: Barnstable, Dukes, Nantucket, Plymouth, Bristol, Norfolk, and Suffolk counties)

_____ DAYS (*If no days, skip to question 24 / If one or more days go to question 16*)

16. In the past 12 months, did *any* of your partyboat fishing trips from a partyboat leaving from *Zone 1* involve spending at least one night away from your residence (motel, campsite, at friends, aboard partyboat, etc.)?

- 1 YES (*If yes, go to question 17*)
- 2 NO (*If no, skip to question 23*)

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17. In the past 12 months, how many trips did you take that involved spending at least one night away from your residence and included at least one day of partyboat fishing from a partyboat that left from *Zone 1*?

_____ TRIPS IN PAST 12 MONTHS

18. On a typical overnight trip that involved partyboat fishing from *Zone 1* in the past 12 months, how many nights did you spend away from your residence?

_____ NIGHTS PER TRIP

19. On a typical trip during which you went partyboat fishing from *Zone 1* in the past 12 months, how many days did you spend partyboat fishing?

_____ DAYS PARTYBOAT FISHING PER TRIP

20. Considering a typical trip during which you went partyboat fishing from *Zone 1* in the past 12 months, would you have made this trip had you not gone partyboat fishing?

1 YES

2 NO

21. On a *typical* trip in the past 12 months that involved spending at least one night away from your residence and included at least one day of partyboat fishing from *Zone 1*, please estimate how much you spent on each of the following items.

	Total Spent on Trip	Money Spent in Massachusetts	Money Spent in Zone 1
a) Auto costs (fuel, rental car, tolls)	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) ..	\$ _____	\$ _____	\$ _____
c) Partyboat cost (boat fee and tips)	\$ _____	\$ _____	\$ _____
d) Rod rental	\$ _____	\$ _____	\$ _____
e) Partyboat "pool" fee	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Lodging (hotel, rental, camping)	\$ _____	\$ _____	\$ _____
h) Restaurant meals	\$ _____	\$ _____	\$ _____
i) Groceries (food, drinks, ice, etc.)	\$ _____	\$ _____	\$ _____
j) Bait and tackle	\$ _____	\$ _____	\$ _____
k) Anything else (please specify)	\$ _____	\$ _____	\$ _____

22. In the past 12 months, did you take any fishing trips from a partyboat leaving from *Zone 1* that did not involve spending any nights away from your residence?

1 YES (*If yes, go to question 23*)

2 NO (*If no, skip to question 24*)

23. On a *typical* partyboat fishing trip in the past 12 months from a partyboat leaving from *Zone 1*, that did not involve spending any nights away from your residence, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 1
a) Auto costs (fuel, rental car, tolls)	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) ..	\$ _____	\$ _____	\$ _____
c) Partyboat cost (boat fee and tips)	\$ _____	\$ _____	\$ _____
d) Rod rental	\$ _____	\$ _____	\$ _____
e) Partyboat "pool" fee	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Restaurant meals	\$ _____	\$ _____	\$ _____
h) Groceries (food, drinks, ice, etc.)	\$ _____	\$ _____	\$ _____
i) Bait and tackle	\$ _____	\$ _____	\$ _____
j) Anything else (please specify)	\$ _____	\$ _____	\$ _____

Questions 24-32 Relate Only to Zone 2 Partyboat Fishing (please refer to enclosed map)

24. In the past 12 months, how many *days* did you go partyboat fishing from a partyboat that left from *Zone 2*? (see map, Zone 2: Essex and Middlesex counties)

_____ DAYS (*If no days, skip to question 33 ; If one or more days go to question 25*)

25. In the past 12 months, did *any* of your partyboat fishing trips from a partyboat leaving from *Zone 2* involve spending at least one night away from your residence (motel, campsite, at friends, aboard partyboat etc.)?

1 YES (*If yes, go to question 26*)

2 NO (*If no, skip to question 32*)

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26. In the past 12 months, how many trips did you take that involved spending at least one night away from your residence and included at least one day of partyboat fishing from a partyboat that left from *Zone 2*?

_____ TRIPS IN PAST 12 MONTHS

27. On a typical overnight trip that involved partyboat fishing from *Zone 2* in the past 12 months, how many nights did you spend away from your residence?

_____ NIGHTS PER TRIP

28. On a typical trip during which you went partyboat fishing from *Zone 2* in the past 12 months, how many days did you spend partyboat fishing?

_____ DAYS PARTYBOAT FISHING PER TRIP

29. Considering a typical trip during which you went partyboat fishing from *Zone 2* in the past 12 months, would you have made this trip had you not gone partyboat fishing?

1 YES

2 NO

30. On a *typical* trip in the past 12 months that involved spending at least one night away from your residence and included at least one day of partyboat fishing from *Zone 2*, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 2
a) Auto costs (fuel, rental car, tolls)	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) ..	\$ _____	\$ _____	\$ _____
c) Partyboat cost (boat fee and tips)	\$ _____	\$ _____	\$ _____
d) Rod rental	\$ _____	\$ _____	\$ _____
e) Partyboat "pool" fee	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Lodging (hotel, rental, camping)	\$ _____	\$ _____	\$ _____
h) Restaurant meals	\$ _____	\$ _____	\$ _____
i) Groceries (food, drinks, ice, etc.)	\$ _____	\$ _____	\$ _____
j) Bait and tackle	\$ _____	\$ _____	\$ _____
k) Anything else (please specify)	\$ _____	\$ _____	\$ _____

31. In the past 12 months, did you take any fishing trips from a partyboat leaving from *Zone 2* that did not involve spending any nights away from your residence?

- 1 YES (*If yes, go to question 32*)
- 2 NO (*If no, skip to question 33*)

32. On a *typical* partyboat fishing trip in the past 12 months from a partyboat leaving from *Zone 2*, that did not involve spending any nights away from your residence, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 2
a) Auto costs (fuel, rental car, tolls)	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) ..	\$ _____	\$ _____	\$ _____
c) Partyboat cost (boat fee and tips)	\$ _____	\$ _____	\$ _____
d) Rod rental	\$ _____	\$ _____	\$ _____
e) Partyboat "pool" fee	\$ _____	\$ _____	\$ _____
f) Parking.....	\$ _____	\$ _____	\$ _____
g) Restaurant meals	\$ _____	\$ _____	\$ _____
h) Groceries (food, drinks, ice, etc.)	\$ _____	\$ _____	\$ _____
i) Bait and tackle	\$ _____	\$ _____	\$ _____
j) Anything else (please specify)	\$ _____	\$ _____	\$ _____

The following questions will help us better understand partyboat anglers' reasons to fish and their expectations for a satisfying experience.

33. Since the year you started partyboat fishing in Massachusetts, the number of fish you catch per trip has generally:

- 1 DECREASED
- 2 INCREASED
- 3 STAYED ABOUT THE SAME
- 4 DON'T KNOW

34. Below is a list of reasons why people fish. Please circle the number that indicates how important each item is to you as a reason for going *partyboat* fishing in Massachusetts.

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a) To be outdoors	1	2	3	4	5
b) For family recreation	1	2	3	4	5
c) To experience new and different things	1	2	3	4	5
d) For relaxation	1	2	3	4	5
e) To be close to the water	1	2	3	4	5
f) To obtain fish for eating	1	2	3	4	5
g) To get away from the demands of other people	1	2	3	4	5
h) For the experience of the catch	1	2	3	4	5
i) To test my equipment	1	2	3	4	5
j) To share experiences with friends, family, or other fishing partners	1	2	3	4	5
k) To win the boat "pool"	1	2	3	4	5
l) To develop my skills	1	2	3	4	5
m) For the challenge or sport	1	2	3	4	5
n) For the fun of catching fish	1	2	3	4	5
o) To catch fish to share with other people	1	2	3	4	5

35. Please list the three reasons from above that you would rank as most important to your Massachusetts *partyboat* fishing experience. (Insert the appropriate letters below)

_____ MOST IMPORTANT

_____ SECOND MOST IMPORTANT

_____ THIRD MOST IMPORTANT

36. Please indicate the extent to which you agree or disagree with each of the following statements about *partyboat fishing* in Massachusetts.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) The more fish I catch the happier I am	1	2	3	4	5
b) A fishing trip can be successful even if no fish are caught	1	2	3	4	5
c) I usually eat the fish I catch	1	2	3	4	5
d) A successful fishing trip is one in which many fish are caught	1	2	3	4	5
e) I would rather catch one or two big fish than ten smaller fish	1	2	3	4	5
f) When I go fishing I'm just as happy if I don't catch a fish	1	2	3	4	5
g) It doesn't matter to me what type of fish I catch	1	2	3	4	5
h) The bigger the fish, the better the fishing trip	1	2	3	4	5
i) I'm just as happy if I don't keep the fish I catch	1	2	3	4	5
m) The partyboat fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	1	2	3	4	5
n) I generally get my money's worth when I go partyboat fishing in Massachusetts	1	2	3	4	5

37. Do you support or oppose the idea of a mandatory saltwater fishing license for Massachusetts? (Please circle only one number)

- 1 SUPPORT LICENSE WITHOUT A FEE
- 2 SUPPORT LICENSE WITH A FEE
- 3 OPPOSE LICENSE ALTOGETHER
- 4 NO OPINION

38. Please indicate the extent to which you agree or disagree with the following statements as to why you don't fish from *partyboats* in Massachusetts more frequently.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) I believe an increase in my fishing activity would be bad for the resource	1	2	3	4	5
b) Partyboat costs are too high	1	2	3	4	5
c) I can't catch enough fish to suit me	1	2	3	4	5
d) I can't catch enough keepers to take home	1	2	3	4	5
e) Too far a drive to get to partyboat sites	1	2	3	4	5
f) Partyboats don't target the types of fish I prefer to catch	1	2	3	4	5
g) I have too many other demands on my time	1	2	3	4	5
h) It is difficult to find others to fish with me	1	2	3	4	5
i) Other leisure activities take up my time	1	2	3	4	5
j) Fishing regulations are too restrictive	1	2	3	4	5
k) Partyboats are too crowded	1	2	3	4	5
l) I am afraid to eat the fish I catch because of pollutants and contamination	1	2	3	4	5

39. Did you purchase a freshwater fishing license in your state of residence in 1998?

1 YES

2 NO

40. Please indicate whether you support or oppose the following management tools for management of Massachusetts' recreational saltwater fisheries.

	Strongly Support	Somewhat Support	Neutral	Somewhat Oppose	Strongly Oppose	Don't Know
a) Releasing fish below a certain length (minimum size limit)	1	2	3	4	5	6
b) Releasing fish below a certain length and above a certain maximum length (slot limit) ...	1	2	3	4	5	6
c) Being allowed to keep only a certain number of fish you catch per day (daily bag limit)	1	2	3	4	5	6
d) Not being allowed to keep certain types of fish during certain times of year	1	2	3	4	5	6
e) Not allowing recreational anglers to sell their catch	1	2	3	4	5	6
f) Not allowing recreational harvest of striped bass in <i>federal</i> waters beyond three miles from shore	1	2	3	4	5	6
g) Increasing the minimum size limit while also increasing the daily bag limit of a given type of fish	1	2	3	4	5	6
h) Decreasing the minimum size limit while also decreasing the daily bag limit of a given type of fish	1	2	3	4	5	6

41. Please indicate how important each of the following factors is in deciding whether you go *partyboat* fishing in Massachusetts as compared to some other type of fishing you may do in Massachusetts.

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important	Don't Do Any Other Fishing
a) The cost of partyboat fishing	1	2	3	4	5	6
b) The types of fish partyboats target	1	2	3	4	5	6
c) The number of fish I can take home	1	2	3	4	5	6
d) The distance to travel to a partyboat site	1	2	3	4	5	6

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42. For each of the types of fishing listed below (a through e), please indicate if the number of fishing trips you made per year in Massachusetts *decreased, stayed about the same, or increased* from 1988-1993 and from 1994-1998.

Circle minus sign for decreased ⊖

Circle "s" for stayed about the same Ⓢ

Circle plus sign for increased ⊕

Circle "n" for none if you did not do that kind of fishing during the years indicated Ⓝ

	1988 through 1993				1994 through 1998			
a) saltwater shore fishing in Massachusetts	-	s	+	n	-	s	+	n
b) saltwater charterboat fishing in Mass.	-	s	+	n	-	s	+	n
c) saltwater partyboat fishing in Mass.	-	s	+	n	-	s	+	n
d) saltwater private boat fishing in Mass.	-	s	+	n	-	s	+	n
e) freshwater fishing in Massachusetts	-	s	+	n	-	s	+	n

43. Please indicate how important each of the following items is in your *selection of a particular Massachusetts partyboat to fish with.*

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a) Distance from home to port.....	1	2	3	4	5
b) Species of fish boat targets	1	2	3	4	5
c) Size of fish typically caught.....	1	2	3	4	5
d) Number of fish typically caught	1	2	3	4	5
e) Captain's reputation	1	2	3	4	5
f) Cost of boat fees	1	2	3	4	5
g) Comfort features on the boat	1	2	3	4	5
h) Courteous and helpful crew	1	2	3	4	5
i) Previous personal experience	1	2	3	4	5
j) Word of mouth	1	2	3	4	5
k) Size of boat.....	1	2	3	4	5
l) Saw advertisement in paper/magazine.....	1	2	3	4	5

The following questions will help us to know more about partyboat anglers. The information provided will remain strictly confidential and you will not be identified with your answers.

44. How old were you on your last birthday?

_____ YEARS

45. Are you?

1 MALE 2 FEMALE

46. Would you describe your ethnic background as: (Please circle only one)

1 WHITE 4 ASIAN
 2 BLACK 5 NATIVE AMERICAN INDIAN
 3 HISPANIC 6 OTHER (PLEASE SPECIFY) _____

**47. How many years of formal education have you completed?
 (for example: high school graduate (or GED) = 12)**

_____ YEARS

48. What is the ZIP CODE of your current home residence?

49. What is your current marital status?

1 SINGLE 4 SEPARATED
 2 MARRIED 5 WIDOWED
 3 DIVORCED

50. What is your approximate annual household income before taxes?

1 Under \$15,000	5 \$60,001 - \$85,000
2 \$15,001 - \$30,000	6 \$85,001 - \$110,000
3 \$30,001 - \$45,000	7 \$110,001 - \$135,000
4 \$45,001 - \$60,000	8 \$135,001 and above

Any additional comments you may have about this survey or saltwater fishing in Massachusetts would be appreciated here:

A summary report of the results of this survey will be posted in the spring of 1999 on our web site at:

<http://www.umass.edu/hd/projects.html>

Would you like a written summary of the results of this survey sent to you?

- 1 YES
- 2 NO

Your contribution of time to this study is greatly appreciated. Please return your completed questionnaire in the postage paid return envelop or to the following address as soon as possible. **Thank you.**

Dr. David K. Loomis
University of Massachusetts
Department of Forestry and Wildlife Management
Human Dimensions Research Unit
Holdsworth Natural Resources Center
Amherst, MA 01003-4210

Questionnaire # _____

Appendix A2. Socio-economic mail survey questionnaire of Massachusetts saltwater private boat anglers.

1998 SURVEY OF MASSACHUSETTS SALTWATER PRIVATE BOAT FISHING PAGE 1

In the following questions, please tell us about your fishing activity and experience. “Shore” fishing can include fishing from a beach, bank, jetty, pier, dock, bridge, break-water, causeway or wading in water. For the purposes of this survey, “partyboat” is defined as any boat where people pay per person to go fishing. A “charterboat” is a boat which a group of people have paid a flat fee for use of the entire boat for a period of time.

1. What year did you first start fishing in saltwater?
19_____
2. What year did you first start fishing from a *privately owned boat* in saltwater?
19_____
3. In the past 12 months, how many *days* did you go saltwater fishing from:

_____ DAYS	A PRIVATELY OWNED BOAT IN MASSACHUSETTS
_____ DAYS	A PARTYBOAT IN MASSACHUSETTS
_____ DAYS	A PARTYBOAT IN ANOTHER STATE
_____ DAYS	A CHARTERBOAT IN MASSACHUSETTS
_____ DAYS	THE SHORE IN MASSACHUSETTS (includes beach, bank, pier, jetty, dock, bridge)
4. Which of the following facility types did you make use of to go *saltwater private boat fishing* in Massachusetts in the past 12 months? (You may circle more than one type)

1	PUBLIC BOAT LAUNCH FACILITY
2	PRIVATE BOAT LAUNCH FACILITY
3	PUBLIC ACCESS MARINA
4	PRIVATE ACCESS MARINA
5	OTHER (PLEASE SPECIFY) _____
5. In the past 12 months, how many times did you go on a whale watching cruise?
_____ TIMES
6. In the past 12 months, did you fish in freshwater?

_____	YES (<i>If yes, go to question 7</i>)
_____	NO (<i>If no, skip to question 8</i>)

1998 SURVEY OF MASSACHUSETTS SALTWATER PRIVATE BOAT FISHING PAGE 2

7. In the past 12 months, how many *days* did you go *freshwater* fishing from:

- _____ DAYS A PRIVATELY OWNED BOAT IN MASSACHUSETTS
- _____ DAYS A PRIVATELY OWNED BOAT IN ANOTHER STATE
- _____ DAYS THE SHORE IN MASSACHUSETTS
- _____ DAYS THE SHORE IN ANOTHER STATE

Next we would like some more detailed information about your fishing skill level and the importance of fishing in your life.

8. Please fill in the appropriate letter from the list provided, of the fish species you most prefer to catch when *saltwater private boat fishing* in Massachusetts.

- | | | |
|-----------------------------|----------------------------|--------------------|
| _____ Most Preferred | a) summer flounder (fluke) | f) bluefish |
| _____ Second Most Preferred | b) scup (porgy) | g) winter flounder |
| _____ Third Most Preferred | c) Atlantic cod | h) striped bass |
| | d) tautog (blackfish) | i) other (specify) |
| | e) Atlantic mackerel | j) no preference |

9. When I participate in the sport of *saltwater private boat fishing* I feel like:
(Please circle only one number)

- 1 an outsider. I am uncomfortable when I go saltwater private boat fishing, and I don't really feel like I am part of the fishing scene.
- 2 an observer or irregular participant. Sometimes it is fun, entertaining or rewarding to go saltwater private boat fishing.
- 3 a habitual and regular participant in the sport of saltwater private boat fishing.
- 4 an insider to the sport. Saltwater private boat fishing is an important part of who I am.

10. During a saltwater private boat fishing experience, I can best be described as:

- 1 being somewhat uncertain. I am unsure about what I can or cannot do while saltwater private boat fishing, or how to do it.
- 2 having some understanding of saltwater private boat fishing, but still in the process of learning more about saltwater shore fishing. I am becoming more familiar and comfortable with saltwater private boat fishing.
- 3 becoming comfortable with the sport. I have regular, routine, and predictable experiences. I have a good understanding of what I can do while saltwater private boat fishing, and how to do it.
- 4 a knowledgeable expert in the sport and/or someone who is comfortable encouraging, teaching and enhancing opportunities for others who are interested in saltwater private boat fishing.

11. My *relationships* with other saltwater private boat anglers are:

- 1 not established. I really don't know any other saltwater private boat anglers.
- 2 very limited. I know some other saltwater private boat anglers by sight and sometimes talk with them, but I don't know their names.
- 3 one of familiarity. I know the names of other saltwater private boat anglers, and often speak with them.
- 4 close. I have personal and close friendships with other saltwater private boat anglers. These friendships often revolve around saltwater private boat fishing.

12. My *commitment* to saltwater private boat fishing is:

- 1 almost nonexistent. I basically don't care whether or not I continue to go saltwater private boat fishing.
- 2 moderate. I will continue to go saltwater private boat fishing as long as it is entertaining and provides the benefits I want.
- 3 fairly strong. I have a sense of being a member of the activity, and it is likely I will continue to fish in saltwater from private boats for a long time.
- 4 very strong. I am totally committed to saltwater private boat fishing. I encourage others to go saltwater boat fishing, and seek to ensure the activity continues into the future.

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13. What type of group do you go saltwater private boat fishing with *most often*?
(Please circle only one number)

- 1 BY YOURSELF
- 2 FAMILY
- 3 FRIENDS
- 4 CO-WORKERS
- 5 OTHER (specify) _____

14. Who first introduced you to saltwater private boat fishing?
(Please circle only one number)

- | | |
|------------------|--------------------------|
| 1 YOURSELF | 6 GRANDPARENTS |
| 2 FATHER | 7 OTHER CLOSE RELATIVE |
| 3 MOTHER | 8 FRIEND |
| 4 SPOUSE | 9 CO-WORKER |
| 5 BROTHER/SISTER | 10 OTHER (specify) _____ |

The following questions will be used to perform an economic analysis of saltwater private boat fishing in Massachusetts. The information you provide will remain strictly confidential and you will not be identified with your answers. Please refer to the *enclosed map* of Massachusetts to answer zone specific questions in this section.

Questions 15-23 Relate Only to Zone 1 Private Boat Fishing
In Saltwater (please refer to enclosed map)

15. In the past 12 months, how many *days* did you go saltwater private boat fishing in *Zone 1*? (Barnstable, Dukes, Nantucket, Plymouth, Bristol, Suffolk, Norfolk counties.)

_____ DAYS (*If no days, skip to question 24 / If one or more days go to question 16*)

16. In the past 12 months, did *any* of your saltwater private boat fishing in *Zone 1* involve spending at least one night away from your residence (motel, campsite, at friends, etc.)?

- 1 YES (*If yes, go to question 17*)
- 2 NO (*If no, skip to question 23*)

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17. In the past 12 months, how many trips did you take that involved spending at least one night away from your residence and included at least one day of saltwater private boat fishing in *Zone 1*?

_____ TRIPS IN PAST 12 MONTHS

18. On a typical overnight trip that involved saltwater private boat fishing in *Zone 1* in the past 12 months, how many nights did you spend away from your residence?

_____ NIGHTS PER TRIP

19. On a typical trip during which you went saltwater private boat fishing in *Zone 1* in the past 12 months, how many days did you spend saltwater private boat fishing?

_____ DAYS SALTWATER PRIVATE BOAT FISHING PER TRIP

20. Considering a typical trip during which you went saltwater private boat fishing in *Zone 1* in the past 12 months, would you have made this trip had you not gone boat fishing?

1 YES

2 NO

21. On a *typical* trip in the past 12 months that involved spending at least one night away from your residence and included at least one day of saltwater private boat fishing in *8Zone 1*, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 1
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.)..	\$ _____	\$ _____	\$ _____
c) Boat launch fee/docking fee	\$ _____	\$ _____	\$ _____
d) Boat fuel	\$ _____	\$ _____	\$ _____
e) Bait	\$ _____	\$ _____	\$ _____
f) Tackle	\$ _____	\$ _____	\$ _____
g) Parking	\$ _____	\$ _____	\$ _____
h) Lodging (hotel, rental, camping)	\$ _____	\$ _____	\$ _____
i) Restaurant meals	\$ _____	\$ _____	\$ _____
j) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
k) Anything else (please specify)	\$ _____	\$ _____	\$ _____

1998 SURVEY OF MASSACHUSETTS SALTWATER PRIVATE BOAT FISHING PAGE 6

22. In the past 12 months, did you take any saltwater private boat fishing trips in *Zone 1* that did not involve spending any nights away from your residence?

- 1 YES (*If yes, go to question 23*)
 2 NO (*If no, skip to question 24*)

23. On a *typical* saltwater private boat fishing trip in the past 12 months from *Zone 1*, that did not involve spending any nights away from your residence, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 1
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Boat launch fee/docking fee	\$ _____	\$ _____	\$ _____
d) Boat fuel	\$ _____	\$ _____	\$ _____
e) Bait	\$ _____	\$ _____	\$ _____
f) Tackle	\$ _____	\$ _____	\$ _____
g) Parking	\$ _____	\$ _____	\$ _____
h) Restaurant meals	\$ _____	\$ _____	\$ _____
i) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
j) Anything else (please specify)	\$ _____	\$ _____	\$ _____

**Questions 24-32 Relate Only to Zone 2 Private Boat Fishing
In Saltwater (please refer to enclosed map)**

24. In the past 12 months, how many *days* did you go saltwater private boat fishing in *Zone 2*? (Essex and Middlesex counties)

_____ DAYS (*If no days, skip to question 33 ; If one or more days go to question 25*)

25. In the past 12 months, did *any* of your saltwater private boat fishing in *Zone 2* involve spending at least one night away from your residence (motel, campsite, at friends ,etc)?

- 1 YES (*If yes, go to question 26*)
 2 NO (*If no, skip to question 32*)

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26. In the past 12 months, how many trips did you take that involved spending at least one night away from your residence and included at least one day of saltwater private boat fishing in *Zone 2*?

_____ TRIPS IN PAST 12 MONTHS

27. On a typical overnight trip that involved saltwater private boat fishing in *Zone 2* in the past 12 months, how many nights did you spend away from your residence?

_____ NIGHTS PER TRIP

28. On a typical trip during which you went saltwater private boat fishing in *Zone 2* in the past 12 months, how many days did you spend private boat fishing?

_____ DAYS PRIVATE BOAT FISHING PER TRIP

29. Considering a typical trip during which you went saltwater private boat fishing in *Zone 2* in the past 12 months, would you have made this trip had you not gone boat fishing?

1 YES

2 NO

30. On a *typical* trip in the past 12 months that involved spending at least one night away from your residence and included at least one day of saltwater private boat fishing in *Zone 2*, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 2
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Boat launch fee/docking fee	\$ _____	\$ _____	\$ _____
d) Boat fuel	\$ _____	\$ _____	\$ _____
e) Bait	\$ _____	\$ _____	\$ _____
f) Tackle	\$ _____	\$ _____	\$ _____
g) Parking	\$ _____	\$ _____	\$ _____
h) Lodging (hotel, rental, camping)	\$ _____	\$ _____	\$ _____
i) Restaurant meals	\$ _____	\$ _____	\$ _____
j) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
k) Anything else (please specify)	\$ _____	\$ _____	\$ _____

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31. In the past 12 months, did you take any saltwater private boat fishing trips in *Zone 2* that did not involve spending any nights away from your residence?

- 1 YES (*If yes, go to question 32*)
- 2 NO (*If no, skip to question 33*)

32. On a *typical* saltwater private boat fishing trip in *Zone 2* in the past 12 months, that did not involve spending any nights away from your residence, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 2
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Boat launch fee/docking fee	\$ _____	\$ _____	\$ _____
d) Boat fuel	\$ _____	\$ _____	\$ _____
e) Bait	\$ _____	\$ _____	\$ _____
f) Tackle	\$ _____	\$ _____	\$ _____
g) Parking	\$ _____	\$ _____	\$ _____
h) Restaurant meals	\$ _____	\$ _____	\$ _____
i) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
j) Anything else (please specify)	\$ _____	\$ _____	\$ _____

The following questions will help us better understand saltwater private boat anglers' reasons to fish and their expectations for a satisfying experience.

33. Since the year you started saltwater private boat fishing in Massachusetts, the number of fish you catch per trip has generally:

- 1 DECREASED
- 2 INCREASED
- 3 STAYED ABOUT THE SAME
- 4 DON'T KNOW

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34. Below is a list of reasons why people fish. Please circle the number that indicates how important each item is to you as a reason for going *saltwater private boat* fishing in Massachusetts.

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a) To be outdoors	1	2	3	4	5
b) For family recreation	1	2	3	4	5
c) To experience new and different things	1	2	3	4	5
d) For relaxation	1	2	3	4	5
e) To be close to the water	1	2	3	4	5
f) To obtain fish for eating	1	2	3	4	5
g) To get away from the demands of other people	1	2	3	4	5
h) For the experience of the catch	1	2	3	4	5
i) To test my equipment	1	2	3	4	5
j) To share experiences with friends, family, or other fishing partners	1	2	3	4	5
k) To catch a "trophy" fish	1	2	3	4	5
l) To develop my skills	1	2	3	4	5
m) For the challenge or sport	1	2	3	4	5
n) For the fun of catching fish	1	2	3	4	5
o) To catch fish to share with other people	1	2	3	4	5

**35. Please list the three reasons from above that you would rank as most important to your Massachusetts *saltwater private boat* fishing experience.
(Insert the appropriate letters below).**

_____ MOST IMPORTANT

_____ SECOND MOST IMPORTANT

_____ THIRD MOST IMPORTANT

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36. Please indicate the extent to which you agree or disagree with each of the following statements about *saltwater private boat fishing* in Massachusetts.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) The more fish I catch the happier I am	1	2	3	4	5
b) A fishing trip can be successful even if no fish are caught	1	2	3	4	5
c) I usually eat the fish I catch	1	2	3	4	5
d) A successful fishing trip is one in which many fish are caught	1	2	3	4	5
e) I would rather catch one or two big fish than ten smaller fish	1	2	3	4	5
f) When I go fishing I'm just as happy if I don't catch a fish	1	2	3	4	5
g) It doesn't matter to me what type of fish I catch	1	2	3	4	5
h) The bigger the fish, the better the fishing trip	1	2	3	4	5
i) I'm just as happy if I don't keep the fish I catch	1	2	3	4	5
j) The saltwater private boat fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	1	2	3	4	5
k) The private boat dockage and launch sites in Massachusetts meet my needs for saltwater fishing	1	2	3	4	5

37. Do you support or oppose the idea of a mandatory saltwater fishing license for Massachusetts? (Please circle only one number)

- 1 SUPPORT LICENSE WITHOUT A FEE
- 2 SUPPORT LICENSE WITH A FEE
- 3 OPPOSE LICENSE ALTOGETHER
- 4 NO OPINION

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38. Please indicate the extent to which you agree or disagree with the following statements as to why you don't participate in *saltwater private boat fishing* in Massachusetts more often.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) Fishing regulations are too confusing	1	2	3	4	5
b) I believe an increase in my fishing activity would be bad for the resource	1	2	3	4	5
c) Costs associated with private boat fishing are too high	1	2	3	4	5
d) I can't catch enough fish to suit me	1	2	3	4	5
e) I can't catch enough keepers to take home	1	2	3	4	5
f) Too far a drive to get to marina/launch site	1	2	3	4	5
g) I have too many other demands on my time	1	2	3	4	5
h) It is difficult to find others to fish with me	1	2	3	4	5
i) Other leisure activities take up my time	1	2	3	4	5
j) Fishing regulations are too restrictive	1	2	3	4	5
k) I am afraid to eat the fish I catch because of pollutants and contamination	1	2	3	4	5
l) Too much effort to keep boat in good working order	1	2	3	4	5
m) I don't always have access to a private boat	1	2	3	4	5

39. Did you purchase a freshwater fishing license in your state of residence in 1998?

1 YES

2 NO

1998 SURVEY OF MASSACHUSETTS SALTWATER PRIVATE BOAT FISHING PAGE 12

40. Please indicate whether you support or oppose the following management tools for management of Massachusetts' recreational saltwater fisheries.

	Strongly Support	Somewhat Support	Neutral	Somewhat Oppose	Strongly Oppose	Don't Know
a) Releasing fish below a certain length (minimum size limit)	1	2	3	4	5	6
b) Releasing fish below a certain length and above a certain maximum length (slot limit) ..	1	2	3	4	5	6
c) Being allowed to keep only a certain number of fish you catch per day (daily bag limit) ...	1	2	3	4	5	6
d) Not being allowed to keep certain types of fish during certain times of year	1	2	3	4	5	6
e) Not allowing recreational anglers to sell their catch	1	2	3	4	5	6
f) Not allowing recreational harvest of striped bass in <i>federal</i> waters beyond three miles from shore	1	2	3	4	5	6
g) Increasing the minimum size limit while also increasing the daily bag limit of a given type of fish	1	2	3	4	5	6
h) Decreasing the minimum size limit while also decreasing the daily bag limit of a given type of fish	1	2	3	4	5	6

41. Please indicate how important each of the following factors is in deciding whether you go saltwater private boat fishing in Massachusetts as compared to some other type of fishing you may do in Massachusetts.

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important	Don't Do Any Other Fishing
a) The cost of private boat fishing	1	2	3	4	5	6
b) The types of fish I can catch from when private boat fishing	1	2	3	4	5	6
c) The number of fish I can take home	1	2	3	4	5	6
d) The distance to travel to a boat launch site or marina where boat is docked	1	2	3	4	5	6

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42. For each of the types of fishing listed below (a through e), please indicate if the number of fishing trips you made per year in Massachusetts *decreased, stayed about the same, or increased* from 1988-1993 and from 1994-1998.

Circle minus sign for decreased (⊖)

Circle "s" for stayed about the same (Ⓢ)

Circle plus sign for increased (⊕)

Circle "n" for none if you did not do that kind of fishing during the years indicated (Ⓝ)

	1988 through 1993				1994 through 1998			
a) saltwater shore fishing in Massachusetts	-	s	+	n	-	s	+	n
b) saltwater charterboat fishing in Mass.	-	s	+	n	-	s	+	n
c) saltwater partyboat fishing in Mass.	-	s	+	n	-	s	+	n
d) saltwater private boat fishing in Mass.	-	s	+	n	-	s	+	n
e) freshwater fishing in Massachusetts	-	s	+	n	-	s	+	n

43. Please indicate how important each of the following items is in your *selection* of a particular marina, dock or launch site to use when you go saltwater private boat fishing

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a) Distance from home to site.....	1	2	3	4	5
b) Cost to use site	1	2	3	4	5
c) Fishing quality in nearby waters	1	2	3	4	5
d) Maintenance and upkeep of site	1	2	3	4	5
e) Scenery and natural surroundings	1	2	3	4	5
f) Cleanliness of water/ water quality	1	2	3	4	5
g) Crowdedness/ number of other private boats	1	2	3	4	5
h) Friendliness and cooperation of on-site staff.....	1	2	3	4	5
i) Previous personal experience	1	2	3	4	5
j) Word of mouth	1	2	3	4	5
k) Opportunity for social interaction.....	1	2	3	4	5
l) Facilities at site	1	2	3	4	5

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The following questions will help us to know more about saltwater private boat anglers.
The information provided will remain strictly confidential and you will not be
identified with your answers.

44. How old were you on your last birthday?

_____ YEARS

45. Are you?

1 MALE 2 FEMALE

46. Would you describe your ethnic background as: (Please circle only one)

1 WHITE 4 ASIAN
2 BLACK 5 NATIVE AMERICAN INDIAN
3 HISPANIC 6 OTHER (PLEASE SPECIFY) _____

**47. How many years of formal education have you completed?
(for example: high school graduate (or GED) = 12)**

_____ YEARS

48. What is the ZIP CODE of your current home residence?

49. What is your current marital status?

1 SINGLE 4 SEPARATED
2 MARRIED 5 WIDOWED
3 DIVORCED

50. What is your approximate annual household income before taxes?

1 Under \$15,000	5 \$60,001 - \$85,000
2 \$15,001 - \$30,000	6 \$85,001 - \$110,000
3 \$30,001 - \$45,000	7 \$110,001 - \$135,000
4 \$45,001 - \$60,000	8 \$135,001 and above

1998 SURVEY OF MASSACHUSETTS SALTWATER PRIVATE BOAT FISHING PAGE 15

Any additional comments you may have about this survey or saltwater fishing in Massachusetts would be appreciated here:

A summary report of the results of this survey will be posted in the spring of 1999 on our web site at:

<http://www.umass.edu/hd/projects.html>

Would you like a written summary of the results of this survey sent to you?

1 YES

2 NO

Your contribution of time to this study is greatly appreciated. Please return your completed questionnaire in the postage paid return envelop or to the following address as soon as possible. **Thank you.**

Dr. David K. Loomis
University of Massachusetts
Department of Forestry and Wildlife Management
Human Dimensions Research Unit
Holdsworth Natural Resources Center
Amherst, MA 01003-4210

Questionnaire # _____

Appendix A3. Socio-economic mail survey questionnaire of Massachusetts saltwater shore anglers.

1998 SURVEY OF MASSACHUSETTS SALTWATER SHORE FISHING PAGE 1

In the following questions, please tell us about your fishing activity and experience. “Shore” fishing can include fishing from a beach, bank, jetty, pier, dock, bridge, breakwater, causeway or wading in water. For the purposes of this survey, “partyboat” is defined as any boat where people pay per person to go fishing. A “charterboat” is a boat which a group of people have paid a flat fee for use of the entire boat for a period of time.

1. What year did you first start fishing in saltwater?
19_____
2. What year did you first start fishing from the *shore* in saltwater?
19_____
3. In the past 12 months, how many *days* did you go saltwater fishing from:

_____ DAYS	THE SHORE IN MASSACHUSETTS
_____ DAYS	A PARTYBOAT IN MASSACHUSETTS
_____ DAYS	A PARTYBOAT IN ANOTHER STATE
_____ DAYS	A CHARTERBOAT IN MASSACHUSETTS
_____ DAYS	A PRIVATELY OWNED BOAT IN MASSACHUSETTS
4. Which of the following specific types of *saltwater shore fishing* did you do in Massachusetts in the past 12 months? (You may circle more than one type)

1	SURFCASTING FROM A BEACH
2	FROM A JETTY OR BREAKWATER
3	FROM A FISHING PIER OR DOCK
4	FROM A BRIDGE OR CAUSEWAY
5	OTHER (PLEASE SPECIFY) _____
5. In the past 12 months, how many times did you go on a whale watching cruise?
_____ TIMES
6. In the past 12 months, did you fish in freshwater?

_____	YES (<i>If yes, go to question 7</i>)
_____	NO (<i>If no, skip to question 8</i>)

1998 SURVEY OF MASSACHUSETTS SALTWATER SHORE FISHING PAGE 2

7. In the past 12 months, how many *days* did you go *freshwater* fishing from:

_____ DAYS A PRIVATELY OWNED BOAT IN MASSACHUSETTS

_____ DAYS A PRIVATELY OWNED BOAT IN ANOTHER STATE

_____ DAYS THE SHORE IN MASSACHUSETTS

_____ DAYS THE SHORE IN ANOTHER STATE

Next we would like some more detailed information about your fishing skill level and the importance of fishing in your life.

8. Please fill in the appropriate letter from the list provided, of the fish species you most prefer to catch when *saltwater shore fishing* in Massachusetts:

_____ Most Preferred

_____ Second Most Preferred

_____ Third Most Preferred

- | | |
|----------------------------|--------------------|
| a) summer flounder (fluke) | e) bluefish |
| b) scup (porgy) | f) winter flounder |
| c) pollock | g) striped bass |
| d) Atlantic mackerel | h) other (specify) |
| e) cunner | i) no preference |

9. When I participate in the sport of *saltwater shore fishing* I feel like:
(Please circle only one number)

- 1 an outsider. I am uncomfortable when I go saltwater shore fishing, and I don't really feel like I am part of the fishing scene.
- 2 an observer or irregular participant. Sometimes it is fun, entertaining or rewarding to go saltwater shore fishing.
- 3 a habitual and regular participant in the sport of saltwater shore fishing.
- 4 an insider to the sport. Saltwater shore fishing is an important part of who I am.

1998 SURVEY OF MASSACHUSETTS SALTWATER SHORE FISHING PAGE 3**10. During a saltwater shore fishing experience, I can best be described as:**

- 1 being somewhat uncertain. I am unsure about what I can or cannot do while saltwater shore fishing, or how to do it.
- 2 having some understanding of saltwater shore fishing, but still in the process of learning more about saltwater shore fishing. I am becoming more familiar and comfortable with saltwater shore fishing.
- 3 becoming comfortable with the sport. I have regular, routine, and predictable experiences. I have a good understanding of what I can do while saltwater shore fishing, and how to do it.
- 4 a knowledgeable expert in the sport and/or someone who is comfortable encouraging, teaching and enhancing opportunities for others who are interested in saltwater shore fishing.

11. My *relationships* with other saltwater shore anglers are:

- 1 not established. I really don't know any other saltwater shore anglers.
- 2 very limited. I know some other saltwater shore anglers by sight and sometimes talk with them, but I don't know their names.
- 3 one of familiarity. I know the names of other saltwater shore anglers, and often speak with them.
- 4 close. I have personal and close friendships with other saltwater shore anglers. These friendships often revolve around saltwater shore fishing.

12. My *commitment* to saltwater shore fishing is:

- 1 almost nonexistent. I basically don't care whether or not I continue to go saltwater shore fishing.
- 2 moderate. I will continue to go saltwater shore fishing as long as it is entertaining and provides the benefits I want.
- 3 fairly strong. I have a sense of being a member of the activity, and it is likely I will continue to fish in saltwater from the shore for a long time.
- 4 very strong. I am totally committed to saltwater shore fishing. I encourage others to go saltwater shore fishing, and seek to ensure the activity continues into the future.

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13. What type of group do you go saltwater shore fishing with *most often*?
(Please circle only one number)

- 1 BY YOURSELF
- 2 FAMILY
- 3 FRIENDS
- 4 CO-WORKERS
- 5 OTHER (specify) _____

14. Who first introduced you to saltwater shore fishing? (Please circle only one number)

- | | |
|------------------|--------------------------|
| 1 YOURSELF | 6 GRANDPARENTS |
| 2 FATHER | 7 OTHER CLOSE RELATIVE |
| 3 MOTHER | 8 FRIEND |
| 4 SPOUSE | 9 CO-WORKER |
| 5 BROTHER/SISTER | 10 OTHER (specify) _____ |

The following questions will be used to perform an economic analysis of saltwater shore fishing in Massachusetts. The information you provide will remain strictly confidential and you will not be identified with your answers. Please refer to the *enclosed map* of Massachusetts to answer zone specific questions in this section.

Questions 15-23 Relate Only to Zone 1 Shore Fishing
In Saltwater (please refer to enclosed map)

15. In the past 12 months, how many *days* did you go saltwater shore fishing in *Zone 1*?
(Zone 1: Barnstable, Dukes, Nantucket, Plymouth, Bristol, Suffolk, Norfolk counties.)

_____ DAYS (*If no days, skip to question 24 / If one or more days go to question 16*)

16. In the past 12 months, did *any* of your saltwater shore fishing in *Zone 1* involve spending at least one night away from your residence (motel, campsite, at friends, etc.)?

- 1 YES (*If yes, go to question 17*)
- 2 NO (*If no, skip to question 23*)

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17. In the past 12 months, how many trips did you take that involved spending at least one night away from your residence and included at least one day of saltwater shore fishing in *Zone 1*?

_____ TRIPS IN PAST 12 MONTHS

18. On a typical overnight trip that involved saltwater shore fishing in *Zone 1* in the past 12 months, how many nights did you spend away from your residence?

_____ NIGHTS PER TRIP

19. On a typical trip during which you went saltwater shore fishing in *Zone 1* in the past 12 months, how many days did you spend saltwater shore fishing?

_____ DAYS SALTWATER SHORE FISHING PER TRIP

20. Considering a typical trip during which you went saltwater shore fishing in *Zone 1* in the past 12 months, would you have made this trip had you not gone shore fishing?

1 YES

2 NO

21. On a *typical* trip in the past 12 months that involved spending at least one night away from your residence and included at least one day of saltwater shore fishing in *Zone 1*, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 1
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Site entrance fee	\$ _____	\$ _____	\$ _____
d) Bait	\$ _____	\$ _____	\$ _____
e) Tackle	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Lodging (hotel, rental, camping)	\$ _____	\$ _____	\$ _____
h) Restaurant meals	\$ _____	\$ _____	\$ _____
i) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
j) Anything else (please specify)	\$ _____	\$ _____	\$ _____

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22. In the past 12 months, did you take any saltwater shore fishing trips in *Zone 1* that did not involve spending any nights away from your residence?

- 1 YES (*If yes, go to question 23*)
- 2 NO (*If no, skip to question 24*)

23. On a *typical* saltwater shore fishing trip in the past 12 months in *Zone 1*, that did not involve spending any nights away from your residence, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 1
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Site entrance fee	\$ _____	\$ _____	\$ _____
d) Bait	\$ _____	\$ _____	\$ _____
e) Tackle	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Restaurant meals	\$ _____	\$ _____	\$ _____
h) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
i) Anything else (please specify)	\$ _____	\$ _____	\$ _____

**Questions 24-32 Relate Only to Zone 2 Shore Fishing
In Saltwater (please refer to enclosed map)**

**24. In the past 12 months, how many *days* did you go saltwater shore fishing in *Zone 2*?
(Zone 2: Essex and Middlesex counties)**

_____ DAYS (*If no days, skip to question 33 ; If one or more days go to question 25*)

25. In the past 12 months, did *any* of your saltwater shore fishing trips in *Zone 2* involve spending at least one night away from your residence (motel, campsite, at friends,etc.)?

- 1 YES (*If yes, go to question 26*)
- 2 NO (*If no, skip to question 32*)

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26. In the past 12 months, how many trips did you take that involved spending at least one night away from your residence and included at least one day of saltwater shore fishing in *Zone 2*?

_____ TRIPS IN PAST 12 MONTHS

27. On a typical overnight trip that involved saltwater shore fishing in *Zone 2* in the past 12 months, how many nights did you spend away from your residence?

_____ NIGHTS PER TRIP

28. On a typical trip during which you went saltwater shore fishing in *Zone 2* in the past 12 months, how many days did you spend shore fishing?

_____ DAYS SHORE FISHING PER TRIP

29. Considering a typical trip during which you went saltwater shore fishing in *Zone 2* in the past 12 months, would you have made this trip had you not gone shore fishing?

1 YES

2 NO

30. On a *typical* trip in the past 12 months that involved spending at least one night away from your residence and included at least one day of saltwater shore fishing in *Zone 2*, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 2
a) Auto costs (fuel, rental car, tolls)	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Site entrance fee	\$ _____	\$ _____	\$ _____
d) Bait	\$ _____	\$ _____	\$ _____
e) Tackle	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Lodging (hotel, rental, camping)	\$ _____	\$ _____	\$ _____
h) Restaurant meals	\$ _____	\$ _____	\$ _____
i) Groceries (food, drinks, ice, etc.)	\$ _____	\$ _____	\$ _____
j) Anything else (please specify)	\$ _____	\$ _____	\$ _____

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31. In the past 12 months, did you take any saltwater shore fishing trips in *Zone 2* that did not involve spending any nights away from your residence?

- 1 YES (*If yes, go to question 32*)
- 2 NO (*If no, skip to question 33*)

32. On a *typical* saltwater shore fishing trip in *Zone 2* in the past 12 months, that did not involve spending any nights away from your residence, please estimate how much you spent on each of the following items.

	Total Spent On Trip	Money Spent in Massachusetts	Money Spent In Zone 2
a) Auto costs (fuel, rental car, tolls).....	\$ _____	\$ _____	\$ _____
b) Other transportation (airplane, etc.) .	\$ _____	\$ _____	\$ _____
c) Site entrance fee	\$ _____	\$ _____	\$ _____
d) Bait	\$ _____	\$ _____	\$ _____
e) Tackle	\$ _____	\$ _____	\$ _____
f) Parking	\$ _____	\$ _____	\$ _____
g) Restaurant meals	\$ _____	\$ _____	\$ _____
h) Groceries (food, drinks, ice, etc.).....	\$ _____	\$ _____	\$ _____
i) Anything else (please specify)	\$ _____	\$ _____	\$ _____

The following questions will help us better understand saltwater shore anglers' reasons to fish and their expectations for a satisfying experience.

33. Since the year you started saltwater shore fishing in Massachusetts, the number of fish you catch per trip has generally:

- 1 DECREASED
- 2 INCREASED
- 3 STAYED ABOUT THE SAME
- 4 DON'T KNOW

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34. Below is a list of reasons why people fish. Please circle the number that indicates how important each item is to you as a reason for going *saltwater shore* fishing in Massachusetts.

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a) To be outdoors	1	2	3	4	5
b) For family recreation	1	2	3	4	5
c) To experience new and different things	1	2	3	4	5
d) For relaxation	1	2	3	4	5
e) To be close to the water	1	2	3	4	5
f) To obtain fish for eating.....	1	2	3	4	5
g) To get away from the demands of other people	1	2	3	4	5
h) For the experience of the catch	1	2	3	4	5
i) To test my equipment	1	2	3	4	5
j) To share experiences with friends, family, or other fishing partners	1	2	3	4	5
k) To catch a "trophy" fish	1	2	3	4	5
l) To develop my skills	1	2	3	4	5
m) For the challenge or sport	1	2	3	4	5
n) For the fun of catching fish	1	2	3	4	5
o) To catch fish to share with other people	1	2	3	4	5

35. Please list the three reasons from above that you would rank as most important to your Massachusetts *saltwater shore* fishing experience. (Insert the appropriate letters below)

_____ MOST IMPORTANT

_____ SECOND MOST IMPORTANT

_____ THIRD MOST IMPORTANT

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36. Please indicate the extent to which you agree or disagree with each of the following statements about *saltwater shore fishing* in Massachusetts.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) The more fish I catch the happier I am	1	2	3	4	5
b) A fishing trip can be successful even if no fish are caught	1	2	3	4	5
c) I usually eat the fish I catch	1	2	3	4	5
d) A successful fishing trip is one in which many fish are caught	1	2	3	4	5
e) I would rather catch one or two big fish than ten smaller fish	1	2	3	4	5
f) When I go fishing I'm just as happy if I don't catch a fish	1	2	3	4	5
g) It doesn't matter to me what type of fish I catch	1	2	3	4	5
h) The bigger the fish, the better the fishing trip	1	2	3	4	5
i) I'm just as happy if I don't keep the fish I catch	1	2	3	4	5
j) The saltwater shore fishing opportunities in Massachusetts generally meet my needs for a satisfying experience	1	2	3	4	5

37. Do you support or oppose the idea of a mandatory saltwater fishing license for Massachusetts? (Please circle only one number)

- 1 SUPPORT LICENSE WITHOUT A FEE
- 2 SUPPORT LICENSE WITH A FEE
- 3 OPPOSE LICENSE ALTOGETHER
- 4 NO OPINION

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38. Please indicate the extent to which you agree or disagree with the following statements as to why you don't participate in *saltwater shore fishing* in Massachusetts more often.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) Fishing regulations are too confusing	1	2	3	4	5
b) I believe an increase in my fishing activity would be bad for the resource	1	2	3	4	5
c) Costs associated with saltwater shore fishing are too high	1	2	3	4	5
d) I can't catch enough fish to suit me	1	2	3	4	5
e) I can't catch enough keepers to take home	1	2	3	4	5
f) Too far a drive to get to shore fishing sites	1	2	3	4	5
g) When fishing from shore, I can't catch the types of fish I prefer to catch	1	2	3	4	5
h) I have too many other demands on my time	1	2	3	4	5
i) It is difficult to find others to fish with me	1	2	3	4	5
j) Other leisure activities take up my time	1	2	3	4	5
k) Fishing regulations are too restrictive	1	2	3	4	5
m) Shore fishing sites are too crowded	1	2	3	4	5
n) I am afraid to eat the fish I catch because of pollutants and contamination	1	2	3	4	5

39. Did you purchase a freshwater fishing license in your state of residence in 1998?

1 YES

2 NO

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40. Please indicate whether you support or oppose the following management tools for management of Massachusetts' recreational saltwater fisheries.

	Strongly Support	Somewhat Support	Neutral	Somewhat Oppose	Strongly Oppose	Don't Know
a) Releasing fish below a certain length (minimum size limit) 1	2	3	4	5	6	
b) Releasing fish below a certain length and above a certain maximum length (slot limit) 1	2	3	4	5	6	
c) Being allowed to keep only a certain number of fish you catch per day (daily bag limit) ... 1	2	3	4	5	6	
d) Not being allowed to keep certain types of fish during certain times of year 1	2	3	4	5	6	
e) Not allowing recreational anglers to sell their catch 1	2	3	4	5	6	
f) Not allowing recreational harvest of striped bass in <i>federal</i> waters beyond three miles from shore 1	2	3	4	5	6	
g) Increasing the minimum size limit while also increasing the daily bag limit of a given type of fish 1	2	3	4	5	6	
h) Decreasing the minimum size limit while also decreasing the daily bag limit of a given type of fish 1	2	3	4	5	6	

41. Please indicate how important each of the following factors is in deciding whether you go saltwater shore fishing in Massachusetts as compared to some other type of fishing you may do in Massachusetts.

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important	Don't Do Any Other Fishing
a) The cost of shore fishing 1	2	3	4	5	6	
b) The types of fish I can catch from shore 1	2	3	4	5	6	
c) The number of fish I can take home 1	2	3	4	5	6	
d) The distance to travel to a shore fishing site. 1	2	3	4	5	6	

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- 42. For each of the types of fishing listed below (a through e), please indicate if the number of fishing trips you made per year in Massachusetts *decreased, stayed about the same, or increased* from 1988-1993 and from 1994-1998.**

Circle minus sign for decreased \ominus

Circle "s" for stayed about the same $\textcircled{\text{S}}$

Circle plus sign for increased \oplus

Circle "n" for none if you did not do that kind of fishing during the years indicated $\textcircled{\text{n}}$

	1988 through 1993				1994 through 1998			
a) saltwater shore fishing in Massachusetts	-	s	+	n	-	s	+	n
b) saltwater charterboat fishing in Mass.	-	s	+	n	-	s	+	n
c) saltwater partyboat fishing in Mass.	-	s	+	n	-	s	+	n
d) saltwater private boat fishing in Mass.	-	s	+	n	-	s	+	n
e) freshwater fishing in Massachusetts	-	s	+	n	-	s	+	n

- 43. Please indicate how important each of the following is in your *selection* of a particular Massachusetts saltwater shore fishing location.**

	Not At All Important	Slightly Important	Moderately Important	Very Important	Extremely Important
a) Distance from home to site.....	1	2	3	4	5
b) Species of fish typically caught at site.....	1	2	3	4	5
c) Size of fish typically caught.....	1	2	3	4	5
d) Number of fish typically caught	1	2	3	4	5
e) Scenery and natural surroundings	1	2	3	4	5
f) Cleanliness of water/ water quality	1	2	3	4	5
g) Ability to avoid crowds of people at site	1	2	3	4	5
h) Accessibility to site	1	2	3	4	5
i) Previous personal experience	1	2	3	4	5
j) Word of mouth	1	2	3	4	5
k) Availability of parking.....	1	2	3	4	5
l) Facilities at site	1	2	3	4	5

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The following questions will help us to know more about saltwater shore anglers. The information provided will remain strictly confidential and you will not be identified with your answers.

44. How old were you on your last birthday?

_____ YEARS

45. Are you?

1 MALE 2 FEMALE

46. Would you describe your ethnic background as: (Please circle only one)

1 WHITE 4 ASIAN
2 BLACK 5 NATIVE AMERICAN INDIAN
3 HISPANIC 6 OTHER (PLEASE SPECIFY) _____

**47. How many years of formal education have you completed?
(for example: high school graduate (or GED) = 12)**

_____ YEARS

48. What is the ZIP CODE of your current home residence?

49. What is your current marital status?

1 SINGLE 4 SEPARATED
2 MARRIED 5 WIDOWED
3 DIVORCED

50. What is your approximate annual household income before taxes?

1 Under \$15,000	5 \$60,001 - \$85,000
2 \$15,001 - \$30,000	6 \$85,001 - \$110,000
3 \$30,001 - \$45,000	7 \$110,001 - \$135,000
4 \$45,001 - \$60,000	8 \$135,001 and above

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Any additional comments you may have about this survey or saltwater fishing in Massachusetts would be appreciated here:

A summary report of the results of this survey will be posted in the spring of 1999 on our web site at:

<http://www.umass.edu/hd/projects.html>

Would you like a written summary of the results of this survey sent to you?

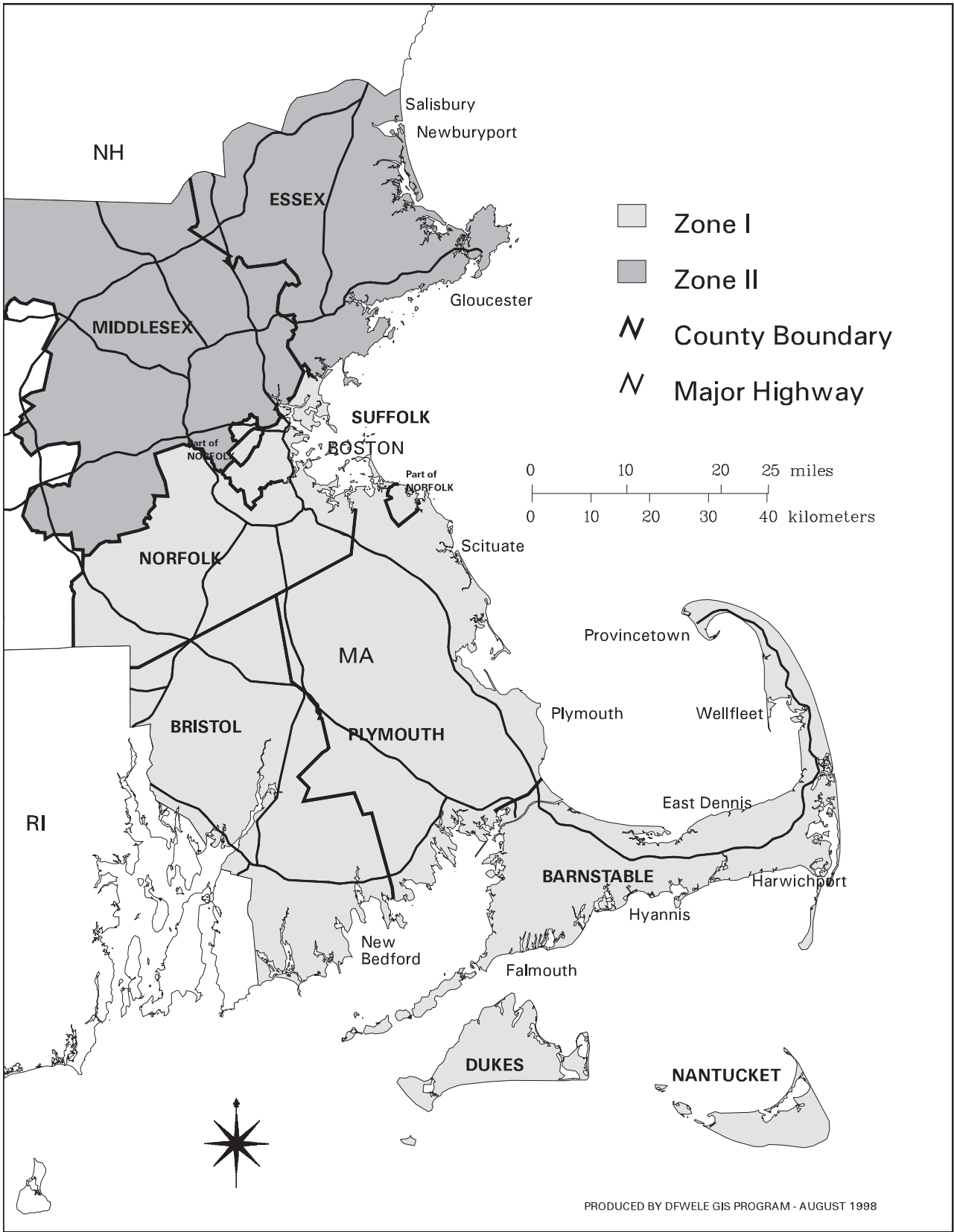
- 1 YES
- 2 NO

Your contribution of time to this study is greatly appreciated. Please return your completed questionnaire in the postage paid return envelop or to the following address as soon as possible. **Thank you.**

Dr. David K. Loomis
University of Massachusetts
Department of Forestry and Wildlife Management
Human Dimensions Research Unit
Holdsworth Natural Resources Center
Amherst, MA 01003-4210

Questionnaire # _____

Appendix B. Map of Massachusetts saltwater fishing zones used for economic analysis.



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