



United States  
Department of  
Agriculture

Forest Service

Northeastern Forest  
Experiment Station

General Technical  
Report NE- 145



# PROCEEDINGS OF THE 1990 NORTHEASTERN RECREATION RESEARCH SYMPOSIUM

FEBRUARY 25-28, 1990

SARATOGA SPRINGS, NEW YORK



## **NORTHEASTERN RECREATION RESEARCH MEETING POLICY STATEMENT**

The Northeast Recreation Research meeting seeks to foster quality information exchange between recreation and travel resource managers and researchers throughout the Northeast. The forum provides opportunities for managers from different agencies and states, and from different governmental levels, to discuss current issues and problems in the field. Students and all those interested in continuing education in recreation and travel resource management are particularly welcome.

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The Steering Committee wishes to thank John Nelson for his assistance in developing the conference data base.

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RECREATION RESEARCH SYMPOSIUM**

FEBRUARY 25-28, 1990

State Parks Management and Research Institute

Saratoga Springs, New York

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## THE ECONOMICS OF WILDLIFE REINTRODUCTION

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Economic values associated with wildlife include personal use value and such extramarket values as option value and several forms of existence values. In this paper, we examine these values for three species recently reintroduced into New England: the bald eagle, the wild turkey, and the Atlantic salmon. Results suggest that economic values (particularly existence values) are substantial for these species.

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Over the past two centuries dramatic land-use changes, environmental degradation, population increases, and pressures from hunting and fishing have caused the extinction of some fish and wildlife species and great changes in the natural range of others. Periodically, we have attempted to counter these shifts and preserve endangered species or to reintroduce species into areas where they had once been plentiful. Restoration efforts (which can be quite costly and have a decidedly mixed success record) have usually occurred when public sentiment has enabled political action or when specific groups like hunters or fishers have financed the restoration of a game species through excise tax payments. Today's decision-making climate, however, often requires more sophisticated economic analysis, so economists have needed to extend the concepts of benefit/cost analysis to incorporate a broader spectrum of benefits produced by wildlife restoration programs. In this paper, we examine the economic values associated with three such restoration programs in New England: the bald eagle (*Haliaeetus leucocephalus*), wild turkey (*Meleagris gallaparo*), and Atlantic salmon (*Salmo salar*).

Each of these species has suffered dramatic declines in the New England region. On land, habitat loss began with the first European settlers who cleared the almost contiguous forest to establish cropland and pasture. By 1850, nearly 70 percent of the original forest

had been removed (Glass 1974). In the waters, dam construction and pollution eliminated the salmon from most of New England.

By the late nineteenth century, however, the situation had begun to shift. The textile industry moved south and many of the mills along rivers were shifted to other uses or were abandoned. Agriculture moved west to richer lands better suited to new technology. Abandoned farmland soon reverted to forest through natural succession, and by 1987 nearly 81 percent of the region again was forested (Haynes 1989). With the return of suitable habitat and new legal protections, species that had been extirpated or reduced to low population levels began to reestablish themselves. Others that have not repopulated naturally (such as those examined in this paper) have benefited from publicly-financed reintroduction programs, even though the reasons for these programs vary.

In the case of the bald eagle, restoration probably was undertaken because of the sentiment it engenders as the national symbol. Bald eagles have never been common in New England; early populations were persecuted and available habitat declined rapidly. It was not until the 1950's and 1960's, however, that pesticide use decimated remaining populations. In 1978, the U. S. Department of the Interior Fish and Wildlife Service classified the bald eagle as an endangered species in each of the New England states (Engel and Issacs 1982). Restoration programs in New England began with the placement of eagle eggs from Minnesota into eagle nests in Maine, the last state with a resident (although declining) eagle population. Although initial efforts achieved only limited success, restoration efforts were initiated in nearby states. New York placed nestling eagles into hacking towers and released them when they could fly. In New England, restoration programs have focused on Massachusetts and Maine. Success has been quite good and the programs are within reach of the recovery goals set for them (Nickerson 1988). The costs, however, have been high: New York State has spent an estimated \$500,000 on its program; consequently, no further efforts are underway. Eventually, the populations established by the programs are expected to expand to the capacity of the available habitat.

By 1900, massive changes in land use had eliminated entirely the once plentiful eastern wild turkey from the New England/New York region; only a small population remained in south central Pennsylvania. Numerous expensive, and largely unsuccessful attempts to establish viable populations have been made by stocking game-farm-raised turkeys (Cardoza 1983). In the early 1940's, however, the Pennsylvania population began to expand, and by the end of the decade, the wild turkey was reestablished in southwestern New York (Nenno 1980). This naturally expanding population eventually provided the basis for a phenomenally successful trap-and-transfer program. In Vermont, for

example, an initial stocking in 1969 and 1970 of 31 live-trapped turkeys resulted in a 1979 population estimated at 8,000 (Bailey 1980); the total cost of this program over a 5-year period was less than \$75,000. Wild turkeys now exist beyond their original range in some areas, and every New England state permits hunting.

The arrival of Europeans and their subsequent settlement of river basins marked the beginning of the end for New England's Atlantic salmon. Dam construction along river tributaries totally blocked the salmon from its breeding grounds, and by 1800 salmon was extinct virtually throughout the region. Restoration efforts were undertaken in 1865 and 1880 but failed due to pollution, overfishing, and lack of knowledge of the salmon's needs. In 1965, the Anadromous Fish Conservation Act gave new impetus to restoration efforts by providing federal funds. All New England states now participate along with public utilities groups and the U.S. Fish and Wildlife Service. Unfortunately, the restoration program has been expensive and the results have not been encouraging: program completion is estimated to cost four million dollars per year over the next 20 years. In the Connecticut River, the first returning salmon was spotted in 1974, and by 1981 over 500 were counted. By 1989, however, the count had dropped to just over 100 fish. Fortunately, the program has produced a variety of other benefits including greatly improved water quality which has enhanced populations of other valued fish like the American shad.

In sum, past efforts to restore wildlife have occurred when public sentiment for a project has prompted political action. Many of these projects have been expensive, however, and with tight budgets likely to continue for some time, we expect economic analyses--particularly benefit/cost analyses--to play an increasingly important role in decision making about these kinds of programs. Consequently, we must begin to examine the nature and value of benefits produced by these programs.

### *Economic Concepts*

As noted above, wildlife restoration efforts usually have occurred in response to public sentiment or at the wish of specific groups like hunters or fishers. Since much of this activity has been publicly financed and lies outside the realm of traditional market-oriented economics, economists have needed to develop sophisticated methods of benefit/cost analysis in order to incorporate the diverse values involved. Today, two benefit categories are generally recognized for any wildlife species: personal use value and existence value. Personal use is perhaps the most widely studied source of value; it includes both current use of a species and options to preserve opportunities for future use (option value). Personal use values for the bald eagle reflect the value to the individual of observing the actual birds;

for the wild turkey and the Atlantic salmon, it includes both the value of each as a game species and for observation, although observation value is presumably slight in the case of the salmon.

Most past attempts to value wildlife have focused on personal use value; only recently have economists recognized other extramarket values. Past valuation attempts that examined only the direct users of a species may have underestimated substantially the total value. Weisbrod (1964) and Krutilla (1967) were among the first to suggest that economic value might accrue to those not actually using a resource directly. Weisbrod suggested that, in an uncertain world, nonusers might be willing to pay an option price to preserve the possibility of future use (option value), while Krutilla argued that the simple "existence" of natural resources had value for people who had no desire ever to use them. Several motives since have been suggested for Krutilla's "existence value": some people want to insure that a resource or species is available for future generations (bequest value); some are pleased that other people have a chance to enjoy the resource even though they themselves do not care to (altruism); while still others argue that wildlife species and other resources have intrinsic value and should exist independent of any benefit or harm to humans (intrinsic value). While conceptual and definitional issues remain for many of these values (c.f., McConnell 1983, Loomis 1988), this study sought to make the values operational by using contingent valuation methods. Although imperfect for a variety of reasons, contingent valuation remains the only effective technique for quantifying many of the values. Option value was treated as a personal use value because, unlike the other forms of existence value, it reflects the desire for direct personal consumption.

### *The Surveys*

Information on public attitudes and extramarket values was collected in two separate studies: the first surveyed 1,000 randomly selected Massachusetts residents during April, 1988 and concerned the Atlantic salmon. Twenty percent of the forms were returned, of which 181 were complete and useable. The second study was about the bald eagle and wild turkey and used a slightly revised version of the salmon questionnaire. Several variations (each particular to a species or combination of species) were mailed to a total of 1,497 randomly selected persons throughout New England in February, 1989. For the entire survey, 38 percent were returned yielding 452 complete, useable questionnaires. Of these, 88 dealt with the bald eagle and 104 dealt with the wild turkey; the remainder concerned other species or combinations of species. In both the salmon and the bald eagle/wild turkey studies, the samples were drawn from current telephone directories following procedures recommended by Dillman (1978). The questionnaires solicited information on attitudes about particular wildlife species, the monetary value placed on

the existence of those species, and the motives underlying the monetary values. Using contingent valuation techniques, the amount of money people were willing to spend to assure the continued existence of a given species was estimated. Here, respondents were asked if they would be willing to pay a predetermined amount ranging between \$5 and \$100 in 5-dollar increments. This amount was distributed randomly throughout the questionnaires. Those who agreed were asked if they would make any additional contribution. Those who refused were asked if they would contribute any amount. Finally, those refusing to contribute anything at all were asked their reasons. The mean willingness-to-pay was then computed for the sample and projected to the New England population over 18 years of age. In making these projections, nonrespondents were assumed to place a zero value on these species and the projections were adjusted accordingly.

### Results

Although nearly 75 percent of respondents were aware of the existence of both the bald eagle and wild turkey in New England, only 28 percent had ever seen a bald eagle in the wild and only 25 percent had ever seen a wild turkey in the region. Fewer (43 percent) were aware of efforts to restore the Atlantic salmon, and only 12 percent reported ever having seen an Atlantic salmon in New England. Despite this lack of familiarity, however, the continued existence of these species was viewed as quite important: over 80 percent of respondents in both surveys attached at least some importance to the existence of each of these species (Table 1).

For the bald eagle and Atlantic salmon, the reasons for this importance (unfortunately, comparable questions were not asked on the wild turkey survey) were categorized. Twelve percent of the respondents to the bald eagle survey indicated personal use value

(observation), while 80 percent indicated some kind of existence value: either giving others the chance to view eagles (16 percent), ensuring that eagles were available for future generations (23 percent), or the insisting that eagles have intrinsic value (41 percent) (Table 2). For the Atlantic salmon, 94 percent indicated existence values, particularly bequest value (55 percent), to be most important; only 6 percent indicated that preserving the option for future use was important (salmon fishing is currently illegal).

While attitudes provide some indication of importance, an individual's willingness to make a personal monetary donation to promote the welfare of these species may be a more powerful indicator of sentiment. When asked about their willingness to make an annual contribution to maintain populations of these species (Table 3), 48 percent indicated that they would contribute (average of \$19.28) annually to benefit the bald eagle. The remainder refused to contribute. For the wild turkey, 30 percent were willing to contribute (average of \$11.86) annually, while for the Atlantic salmon, 36 percent said they would contribute (average of \$7.93) annually.

When expanded to the populations involved, the willingness-to-pay estimates are imposing (Table 4). For the New England population over age 18, bald eagle and wild turkey protection and enhancement received total annual commitments estimated at \$69.6 million and \$42.8 million, respectively. For the Atlantic salmon, Massachusetts residents indicated an total annual commitment estimated at \$13.5 million. The vast majority of this willingness to pay for wildlife protection and enhancement was attributable to existence rather than personal use values.

The motives for contributing also indicated concern with the species' existence rather than personal use (Table 5). For each of the species, about 47 percent of the respondents indicated that the intrinsic worth of the species was their primary concern while between

Table 1.--Importance for existence of bald eagle, wild turkey, and Atlantic salmon.

| Importance                | Bald eagle<br>(n = 447)<br>(percent) | Wild turkey<br>(n = 447)<br>(percent) | Atlantic salmon<br>(n = 181)<br>(percent) |
|---------------------------|--------------------------------------|---------------------------------------|---|
| Very                      | 53.2                                 | 41.4                                  | 31.0                                      |
| Somewhat                  | 35.6                                 | 40.5                                  | 56.0                                      |
| Not very                  | 5.4                                  | 13.9                                  | *   |
| Not very important at all | 3.4                                  | 3.8                                   | *   |
| Not important             | *                                    | *                                     | 13.0                                      |
| No answer                 | 2.4                                  | 0.4                                   | 0.0                                       |
| Totals                    | 100.0                                | 100.0                                 | 100.0                                     |

\* The surveys differed in their response categories for this question. The bald eagle and wild turkey questionnaires included the first four response categories. The Atlantic salmon survey included only three: "very important," "somewhat important," and "not important."

Table 2.--Reasons why the existence of the bald eagle and Atlantic salmon was important.

| Value  | Bald eagle (percent) |       | Atlantic salmon (percent) |       |
|--|----------------------|-------|---------------------------|-------|
| Personal use   |                      |       |                           |       |
| Current use (observation)                                    | 3.2                  |       |                           |       |
| Option value (chance for future personal observation or use) | 8.8                  |       | 6.0                       |       |
| Subtotal:  |                      | 12.0  |                           | 6.0   |
| Existence value  |                      |       |                           |       |
| Altruism   | 16.0                 |       | *                         |       |
| Bequest  | 23.0                 |       | 55.0                      |       |
| Intrinsic  | 41.0                 |       | 39.0                      |       |
| Subtotal:  |                      | 80.0  |                           | 94.0  |
| No Answer  |                      | 8.0   | 0.0                       |       |
| Total:   |                      | 100.0 |                           | 100.0 |

\* Questions about altruism values were not asked in the salmon survey.

Table 3.--Annual contribution over a 5-year period to maintain bald eagle, wild turkey, and Atlantic salmon populations in New England.

Willingness to Pay

| Species                 | Would give (percent) | Would not give (percent) | Total amount | Mean willingness to pay and standard deviation |
|-------------------------|----------------------|--------------------------|--------------|--|
| Bald eagle (n=79)       | 48                   | 52                       | \$1,523.50   | \$19.28<br>(\$36.86)                           |
| Wild turkey (n=97)      | 30                   | 70                       | \$1,150.00   | \$11.86<br>(\$28.53)                           |
| Atlantic salmon (n=181) | 36                   | 64                       | \$1,436.00   | \$ 7.93<br>(\$16.79)                           |

Table 4.--Estimated annual option and existence values over a 5-year period for bald eagle, wild turkey, and Atlantic salmon. Inference to total New England population by species; estimated value in millions of dollars.

| Value     | Bald eagle <sup>1</sup> | Wild turkey <sup>1</sup> | Atlantic salmon <sup>2</sup> |
|-----------|-------------------------|--------------------------|------------------------------|
| Option    | 7.3                     | 2.6                      | 2.0                          |
| Existence | 62.3                    | 40.2                     | 11.5                         |
| Total:    | 69.6                    | 42.8                     | 13.5                         |

<sup>1</sup> For the New England region

<sup>2</sup> For Massachusetts only

Table 5.--Motives for donating to bald eagle, wild turkey, and Atlantic salmon programs.

Percent of Donation

| Species         | Option value | Existence Value |         |           |       | Grand total |
|-----------------|--------------|-----------------|---------|-----------|-------|-------------|
|                 |              | Altruism        | Bequest | Intrinsic | Total |             |
| Bald eagle      | 10.5         | 12.8            | 30.1    | 46.7      | 89.6  | 100.0       |
| Wild turkey     | 6.1          | 7.6             | 37.6    | 48.7      | 93.9  | 100.0       |
| Atlantic salmon | 15.0         | *               | 38.0    | 47.0      | 85.0  | 100.0       |

\* Questions about altruism were not included in the Atlantic salmon survey.

30 and 40 percent cited the desire to ensure the availability of the species for future generations. Option values ranged from 15.0 percent for the salmon to 6.1 percent for the wild turkey, a surprisingly low figure considering that the turkey has value both as a game bird and for observation.

Despite the size of the willingness-to-pay estimates, a majority of the respondents in each survey refused to make any financial commitment to protecting or enhancing these species. For both the bald eagle and wild turkey, the most common reason for refusing was the sense that the money should come from taxes and license fees instead of donations (44 and 37 percent respectively, Table 6). For the Atlantic salmon, 36 percent of the respondents felt that someone else, particularly industry, should pay the costs. Only 6 percent of respondents refused to contribute to the salmon or wild turkey because they felt these species had no value for them; no one indicated that the bald eagle had no value. It is also important to note that, for the bald eagle and wild turkey, 22 and 24 percent of the respondents, respectively, indicated that the species was important but they refused to place a dollar value on it. This sort of protest indicates that many people do believe that wildlife is priceless, and that forcing it into a valuation context may be ethically wrong, a sentiment that warrants additional study.

#### Discussion and Conclusion

The efforts to restore bald eagles, wild turkeys, and Atlantic salmon to New England enjoy broad public support: from 30 to 48 percent of the respondents were willing to make a financial commitment to maintain or enhance these populations. Moreover, the magnitude of the estimated contributions was substantial: \$69.6 million for the bald eagle and \$42.8 million for the wild turkey from throughout New England, and \$13.5 million for the Atlantic salmon from Massachusetts residents. Most who refused to contribute did not oppose the programs, but questioned the appropriateness of contributions to finance them and the validity of placing

a monetary value on wildlife. Only a small percentage indicated that these species were of no value to them.

When the motives that underlie this strong expression of sentiment are examined, it is evident that only a small amount of it derives from the desire for either current or future personal use. Rather, 90 percent of respondents to the eagle survey, 94 percent of respondents to the wild turkey survey, and 85 percent of respondents to the salmon survey indicated they were motivated by some kind of existence value. These existence values are of various kinds. The most important was intrinsic value--the right of a species to exist on its own merits regardless of any benefit or harm to man; almost half of the respondents to each survey indicated this as the reason for their willingness to contribute. Bequest value--preserving a species for the benefit of future generations was the second most frequently cited reason for being willing to contribute, with between 30 and 38 percent of respondents indicating that this value was important to them. Altruism, the least frequent motive for existence values, still exceeded option values in both the bald eagle and wild turkey surveys.

These results require cautious interpretation. Willingness-to-pay assessments are hypothetical--there are questions about the quality of decision making under such artificial circumstances and about the extent to which respondents would follow through with actual contributions. However, while these questions are valid and there is much debate about them in the literature, the values estimated in this study fall within the range of those reported elsewhere and seem reasonable when compared to previous research results. For example, willingness-to-pay bids for bald eagle preservation have ranged, on average, between \$10.62 and \$75.31 (Boyle and Bishop 1987), while existence values for Atlantic salmon have been estimated at from \$10 to \$30 above the willingness to pay for fishing licenses (Kay, Brown and Allee 1987).

Possible sample bias is another concern: some evidence suggests that the respondents tended to be more affluent and better educated than the population

Table 6.--Reasons respondents would not contribute for bald eagle, wild turkey and Atlantic salmon protection.

| Reason for not contributing   | Bald eagle<br>(n=79)<br>(percent) | Wild turkey<br>(n=97)<br>(percent) | Atlantic salmon<br>(n=181)<br>(percent) |
|---|-----------------------------------|------------------------------------|---|
| Money should come from taxes and license fees instead of donations <sup>1</sup> | 44.0                              | 37.0                               | --                                      |
| Species is not worth anything to me   | 0.0                               | 6.0                                | 6.0                                     |
| Species is important but I refuse to place a dollar value on it <sup>1</sup>    | 22.0                              | 24.0                               | --                                      |
| Population in Maine is sufficient <sup>2</sup>                                  | ---                               | ---                                | 5.0                                     |
| Someone else <sup>2</sup> like industry should pay                              | ---                               | ---                                | 36.0                                    |
| Other   | 34.0                              | 33.0                               | 53.0                                    |
| Total:  | 100.0                             | 100.0                              | 100.0                                   |

<sup>1</sup> Not included on the Atlantic salmon questionnaire.

<sup>2</sup> Not included on bald eagle or wild turkey questionnaires.

as a whole, particularly for the bald eagle and wild turkey surveys. If so, then the inferences to the general population made about total value and species importance could be overstated. Nevertheless, the overwhelming magnitude of responses that found the selected species important, the substantial funds respondents said they were willing to donate, and the reasons for not donating (which tend to be favorable to wildlife) all indicate tremendous public support even if somewhat overestimated because of possible sample bias.

In sum, restoring and maintaining viable wildlife populations is of great importance to the public. Their interest in these projects is reflected in their willingness to donate substantial personal funds to enhance the populations of these species. These donations (although hypothetical in the present case) are motivated primarily by concerns related to existence values rather than by the desire for current or future personal use. Expanding the context of valuation to include existence values enables a more accurate representation of the significance of wildlife to our population.

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## Quelling Controversy Through Public Relations *Implementing a Controlled Moose Hunt*

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Planning and carrying out a public relations strategy can significantly reduce the potential conflict between a natural resource agency and its publics. A strategy can be implemented, using minimal additional funds, that can deliver increased public awareness, understanding and support for an agency introducing a wildlife management plan, including a plan which supports a hunt.

In 1985, the New Hampshire Legislature mandated Fish and Game Department to implement a moose management program that would include public education about "biological status and management needs." It further outlined research and management measures, which could include a moose hunt. In 1986, the Department began planning a controlled hunt for 1988 under the multiple use objectives of the moose management program. The hunt would only be "proposed" until species research confirmed that the state's largest game animal could sustain a hunt.

### THE PLAN

There were virtually no funds set aside to implement either a public relations strategy or any significant information dissemination program at Fish and Game Department in 1986. Beginning in 1987, however, roughly \$25,000 would be made available, through Department funds, for specific use on the public relations aspect of this program. This provided a great opportunity to creatively use existing outreach programs and publications to their fullest potential. The decision was made to promote a Department message of: Trust your wildlife professionals to manage wildlife (in this case, moose).

Staffing was a major obstacle. There was minimal staff to carry-out existing programs, without the addition of a new one. These new responsibilities would later affect the mental and physical well-being of the leaders carrying out this effort.

Within a few days following the Fish and Game Commission's charge in early 1986 to implement a moose hunt in 1988, the Information and Education Division (I & E) staff of five and the Moose Project Leader came up with a preliminary plan, which met the approval of the Executive Director and Game Division Chief, to infuse information and education efforts into every possible existing outreach program and future department publication. The initial objectives were:

- Upgrade an existing slide presentation about the natural history of moose to include current research activities and management plans.

- Develop a natural history, educational brochure about moose.

- Build a series of clear and simple graphic images to visually communicate management information.

- Take the Department's message, through the use of displays, to every possible public event.

- Begin disseminating information about increased research activities and management strategies through existing Department publications.

- Make a concerted effort to bring the research component to the attention of the public through the use of radio, TV, newspapers and magazines.

- Work to secure a base of outdoor journalists sensitive to wildlife management activities.

- Build an educational component into the Hunter Education Course, and work to upgrade the instructors' knowledge base of management activities.

### RESEARCH

It was assumed that this would be an emotional issue that would have the potential of dividing factions within consumptive and nonconsumptive user groups. We knew moose were very popular with residents and tourists alike. But we needed to know a profile of our publics, their perceptions and interactions with the animal. We believed we needed to target residents in the northern and southern regions of the state, rural and city dwellers, nonresident tourists and property owners.

Shortly after the announcement of the proposed moose hunt, a University of New Hampshire professor offered to work with the Department to measure public attitudes regarding moose, the proposed hunt, department performance and the effectiveness of our public relations efforts. A 10-page survey was mailed to 1,250 New Hampshire residents in six target groups using a stratified random sample. Two separate mailings were done with a reminder postcard after the first mailing. The response rate was 72 percent or 906 usable questionnaires.<sup>1</sup>

Game Management and Research Division staff, coordinated by the Moose Project Leader, continued existing research programs and began new ones. The new research work was visually appealing: radio collaring of animals and telemetry monitoring. It was a statement of professional wildlife management at work. We touted it.

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<sup>1</sup> *Public Attitudes Toward Moose Hunting in New Hampshire, July 1988, Maureen P. Donnelly, Lori Sommer and Jerry Vaske. Funding for the project was provided by USDA Forest Service Northeastern Forest Experiment Station, and the University of New Hampshire's Travel Research and Statistics Service, the Department of Leisure Management and Tourism and NH Fish & Game Dept. Many thanks are given to everyone who made this project a success.*

## PERCEPTION VS. REALITY

Regardless of what the reality is with a situation involving wildlife management, it is the perceptions of the public that determines what the reality becomes. We set out to build a case on biological data rather than engage staff in emotional issues. Public concerns were addressed that lent themselves to management information (e.g., the availability of roadside moose for viewing), but the project leader would not engage in emotional-based arguments (e.g., whether or not it was sporting to kill a moose, etc.).

## INFORMATION DISSEMINATION

Information was distributed through normal press channels using press releases, feature stories and summaries. It was also done through a grass-roots effort to bring the management issue to the public through the updated 20-minute slide presentation. Within the nearly two-year time period, approximately 150 of these presentations were given by the Moose Project Leader who addressed research, management and biological questions after the program. A pre-recorded slide presentation was available, but did not gain popularity until after the first hunt took place. People wanted to talk directly to someone who knew what was going on.

The two brochures used -- Moose Management 1988 and The Moose -- became the basis from which most press materials evolved. Research updates were given, then a rehash of the same information, in new form, followed. This allowed the public to be given consistent background information to build a knowledge base about the department's plans and findings.

## PUBLICITY

Continuous contacts were made by an overwhelming number of journalists seeking coverage of the research that would be used to determine if the hunt would take place as proposed. Our objective was to provide as much information as possible, but not impede the research efforts of our biologists.

The Department supplied graphic illustrations, photographs, background information and road kill accident statistics, which were extremely useful in helping journalists tell the story in a fair, accurate manner. Press conferences proved difficult because only the Moose Project Leader was permitted to release new information as it evolved. Time dedicated to species research had priority over press relations, so time given to the press had to be maximized. It was much easier for the project leader to work with I & E staff to disseminate information through printed means because of the control it offered. Dealing with aggressive press members, some bordering hostility, was sometimes too stressful for the biological staff and had the potential to impede the pace of biological research work.

Early on, it became clear that we would have to limit journalists' access to biologists during their field research activities, in order to remain on schedule. A small, select group of trustworthy outdoor wildlife-oriented journalists evolved through trial and error. If a reporter didn't become obtrusive during the fieldwork activity, and presented a story accurately and fairly after the excursion, they were allowed to accompany the biologists later as the story evolved. This proved very valuable to reducing the stress level of biologists who worked many 20-hour days. It also gave the I & E staff some control over scheduling the release of information.

Some reporters were consistently reporting inaccuracies.<sup>2</sup> Some editors appeared caught up with the idea that a hunt was wrong and reported inaccurate information as a result of it. For example, one year *before* the hunt was to take place, an editorial comment after a neutral article on watching moose stated, "This fall <1987> the Fish and Game Department received approval from the state to issue 75 hunting permits...it is yet undetermined as to how many New Hampshire moose were killed."<sup>3</sup>

One newspaper continuously displayed moose as anthropomorphic in their cartoons and contended the Department would be bringing in exorbitant sums of money.<sup>4</sup> In actuality, costs of the research and management program (approximately \$120,000) is twice the amount of the money generated from the hunt (about \$60,000). As interest wanes in 1990, the hunt has begun to lose its position in the public eye. Funds generated by the lottery have started to decrease because many applicants applied as a show of support for the Department.

Press kits with comprehensive background and summarized pertinent information, including graphics, were sent to all members of the press one month before the legislative vote on whether or not to ban the hunt. The Department's graphic material was used by just about every newspaper, magazine and television station reporting the story.

## BUILDING AN IMAGE

Early in the project it was decided that we would use one moose image that communicated a sense of historical presence. This simple, yet immense, figure demanded the attention of the viewer's eye. The moose would become the thread of our visual communications.

Between the period of 1955 and 1988 the state's moose

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<sup>2</sup>It was difficult to move journalists to reporting the latest population estimate as the information became available. One major news reporting service continued to report an inaccurate population estimate nearly one year after support materials were sent announcing the change, and subsequent news releases continually referred to the updated information.

<sup>3</sup>This Week magazine, October 16, 1987, Moose Watch.

<sup>4</sup>Concord Monitor.

herd had grown tremendously. We summarized the growth in a graphic by using the same moose image twice (one at approximately 1-3/4 inches and another at 19-3/4 inches) to visually communicate a burgeoning population growth rate.

The graphic illustrating growth was used in the Moose Management 1988 brochure and later in a full-page paid advertisement in the statewide newspaper.<sup>5</sup> The message used in these print items was the same, "The Resource Always Comes First-- New Hampshire's moose herd has grown a minimum of 33 times in 33 years. After 87 years of protection, Fish and Game Department has scheduled a limited hunt according to RSA 208:1-a." We wanted people to know that we were not implementing a hunt at the expense of the resource.

Professionalism is oftentimes merely a perception because of association. A uniform conveys this professional image. Understanding this concept, the executive director pursued garnering funds to purchase uniforms for Department biological staff to enhance their image. This was not possible. As a result a "professional image" was not portrayed by the use of clothing. The visual impact of this is clearly evident in photos where conservation officers in uniforms with department patches are next to biologists wearing casual clothing. While this has nothing to do with professional ability, it imparts a message as to the professional stature of the individual.

#### SPECIAL EVENTS

Table-top displays featuring moose range, distribution, interaction with deer/brainworm and brief facts about what was known about the species were sent to many agricultural fairs and outdoor shows across the state. Literature accompanied it, but no staff member was available to answer questions from the public. An attempt was made to have conservation officers service these booths, but cooperation was limited.

#### ELECTRONIC MEDIA

Radio was the selected electronic medium used to bring our message to a listening public because television couldn't offer the time needed for discussion of biological issues, and funds weren't available to produce television's more expensive public service announcements or paid advertisements.

Extensive effort was made to contact radio talk show hosts and schedule appearances to discuss the Department's management plans. More than 30 guest appearances were made on these shows.

As the antihunting movement gained momentum, more TV talk show hosts wanted to schedule debates. After

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<sup>5</sup>A typographical error was made in the Moose Management 1988 brochure which changed "1955" to "1950." The error undoubtedly effected our statement to some members of our audience.

one debate, however, the effort was discontinued because wildlife management doesn't lend itself to short, clear-cut explanations. The television forum proved least beneficial in getting the issues fully explained to the public.

Public service announcements, stating the Department had scheduled a hunt, were prepared and sent to radio stations to be read on-the-air. The announcements had a tag ending urging the listener to call or write the Department for information.

#### SECURING SUPPORT

Credibility was enhanced when other like-minded organizations agreed with the Department's position. The New Hampshire Wildlife Federation and National Wildlife Federation joined with Fish and Game to produce the Moose Management 1988 brochure.<sup>6</sup> Each agency was listed as supporting the management plan. New Hampshire Audubon also supported "wildlife management by professionals, not emotions" and had representatives testify to this during the House Fish and Game Committee hearing on legislation which would effectively stop the hunt.

The majority of the Department's hunting constituency supported the controlled hunt as proposed, but lacked the sophistication in use of the press and press agency.<sup>7</sup> Most hunter's actions were reactive rather than proactive, however there were a group of press savvy outdoor writers who moved hunters to action.<sup>8</sup>

#### THE OPPOSITION

The Department's management plan and the professionalism of its biologists were challenged by a group called the "Save the Moose Coalition," which was primarily comprised of animal rights activists (they later joined forces with Friends of Animals). Public perception could be that this group was working to "save" the moose, simply by its name. This group worked diligently to undermine the efforts of the Department, and it continues to do so today. The tactics they use most are press agency and manipulation of emotions.

Demonstrations with sign-carrying activists were done on several occasions, sometimes featuring a person dressed as the moose, "Bullwinkle."

The members of this particular animal rights group, appeared to be coached in press agency and letter writing campaigns. Their efforts seemed to be well

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<sup>6</sup>Text was written in cooperation with the National Wildlife Federation. Over 175,000 six-panel brochures were produced and distributed.

<sup>7</sup>Public Attitudes Toward Moose Hunting in New Hampshire Donnelly et al., 1988

<sup>8</sup>Many thanks to John D. Harrigan, Warren "Mac" McGranahan Mike Garzillo and Tim Jones for their untiring efforts.

planned and coordinated, quite unlike the state pro-hunting groups which rarely became involved in the same magnitude of effort.

New Hampshire Humane Society's 19-year veteran executive director in a newspaper commentary stated, "here in the United States, and especially here in New Hampshire, we continue to hunt. Not for food and clothing, but for 'sport.' However, hunting is on the decline, and 'sportsmen' are now looking to new creatures such as...the moose."<sup>9</sup>

In a direct mail campaign, the NH Society for the Prevention of Cruelty to Animals called on its members and friends to, "help save these gentle and trusting animals from terror and pain."

A newspaper editorial declared, "The hunt, apparently, is more a service to blood lust than anything else."<sup>10</sup>

When the three-day hunt was carried-out in October of 1988, antihunt demonstrations were conducted at two of four check stations. Only four people showed up at each of the two check stations, and their stay only lasted until the TV camera crews left. This was normal activity for this group.

## THE LEGISLATURE

Two bills were introduced in the House of Representatives in January of 1988, which would effectively stop the hunt. Testimony was taken by the House Fish and Game Committee.

A summary of public relations efforts and expenditures (to date) was prepared by Department staff for legislative review. This preparation proved valuable.

The Save the Moose Coalition brought in other antihunt activists to testify along with their members. Friends of Animals sent an ecologist (who formerly worked for a state agency), and the executive director of NH Humane Society testified against the hunt.

Early that day, the Department released initial results of the public attitude survey which indicated 62 percent of the respondents approved of the hunt; 70 percent felt that the agency was doing enough to research the moose herd's needs; and two-thirds rated the Department's wildlife management programs as good to excellent.<sup>11</sup>

The Committee determined the legislation inexpedient to legislate, but later it would be sent to the house floor for a vote.

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<sup>9</sup>*Boston Sunday Globe*, September 13, 1987.

<sup>10</sup>*The Keene Sentinel*, October 5, 1987.

<sup>11</sup>*Moose Hunting in New Hampshire: The Resident's View*, Maureen P. Donnelly, Leisure Management and Tourism Department, University of New Hampshire.

On the day that legislators voted on the two antihunt bills, hunters dressed in blaze orange gathered outside Fish and Game Headquarters before marching to the state house. Unfortunately, the hunters weren't as adept in press agency as the antihunters. No one had called members of the press to alert them of the march. Many disgruntled hunters stood outside Fish and Game and wondered where the press were. It was perceived by some of the hunters that it was Fish and Game's responsibility to call the press for them. This perception is probably because of the Department's reliance on hunting fees as its primary source of funding.

## TIMING

Timing is critical when strategically vying for position. When this public relations project was started, it was believed that Fish & Game would have two-and-a-half years to implement the strategy. However, the legislative component forced conclusion to the 1988 hunt issue in under two years.

When the antihunt bills were introduced as legislation, the Department secured a full-page advertisement (which used the same copy as the moose management brochure) in a statewide newspaper that had the potential of reaching 88,000 households.<sup>12</sup>

The advertisement, detailing the management plan, appeared in the front section of the Sunday newspaper before the vote was taken the following Tuesday. Meanwhile, a political action group (P.A.C.) conducted a telephone poll the evening before the vote and answered last minute questions of legislators.<sup>13</sup> A second P.A.C. sent telegrams to each legislator voicing support for the hunt.<sup>14</sup>

The first bill was defeated with better than a two to one margin, the second bill was defeated in a voice vote.<sup>15</sup>

## FINDINGS

--During and immediately following the limited hunt, press coverage became very positive. We can only attribute this to sticking with the same message and providing as much information as available on a regular basis.

The following findings are opinions of the author:

--Always use more than one person as a spokesperson for a controversial issue. The Moose Project Leader was personally connected to the project in the minds of the public through repetition. Numerous hate letters, threats

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<sup>12</sup>*New Hampshire Sunday News*, January 10, 1988.

<sup>13</sup>*New Hampshire Wildlife Federation*. Many thanks are given for their efforts, particularly those of Ellen Rice, executive director.

<sup>14</sup>*National Rifle Association*, Washington, DC.

<sup>15</sup>The actual vote was 223 to 91, with 82 members not voting.

on her life and those of her pets and livestock, obscene telephone calls and general harassment were received by the. If this project were to be undertaken again, a select group of wildlife biologists, with proven public speaking ability, would be responsible for rotating the responsibilities of communicating with the public and the press about research, management and biological issues.

--Wildlife agencies should commit significant funding to the education and promotion of professional natural resource management. It will prove invaluable when approaching an audience with a controversial issue. Building public confidence for a natural resource agency is an ongoing project that requires continuous attention if attitudes are to be molded favorably.

--A dedicated budget should be set aside to support the public relations efforts needed to carry out a management directive. Decisions that have public impact should only be made after consulting with senior management public relations specialists.

--Wildlife agencies in the Northeast must make a concerted effort to the education and promotion of professional wildlife research and management or the animal rights movement will eventually be successful in thwarting hunting components of management plans.

PENNSYLVANIA TROUT FISHING:  
A CONSIDERATION OF SPECIALIZATION AND  
SOCIAL INTERACTION

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Anglers are not solely interested in catching fish but rather in a variety of aspects of the fishing experience. Trout fishing is considered by many to be one of the most specialized forms of fishing and several researchers have suggested that individuals pursuing this activity seek the lowest levels of social interactions. While this may be the case when compared to other fishing activities, a variety of social interactions may exist within the trout fishing experience. This study focused on the social interactions of trout fishermen and the sub-specializations which exist within the trout fishing specialty. A dynamic relationship was discovered determining that actual and perceived social relationships change with level of specialization.  
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Why Do Fishermen Fish?

Why do fishermen fish? To catch fish of course! This would seem to be the main motivational reason for fishing. However, fishermen are not solely interested in catching fish, but rather in the fishing experience itself (Moeller and Engelken, 1972). There are many other factors that significantly influence the enjoyment and satisfactions of the fishing experience.

Behavioral Aspects of Outdoor Recreation

Recreation is a particular type of human experience that finds its source in intrinsically rewarding, voluntary engagements (mental or physical) during non-obligated time (Driver, 1975). These experiences result from participation in an activity (or from mental engagement only) and this participation is instrumental for realizing specific types of satisfactory experiences that make up overall satisfaction realized from that activity. The word "experience" is used to denote the totality of a person's physiological, psychological, spiritual or other response to a situation. A specific recreation experience then is a specific type of response. Some of these specific experiences will be pleasing or "good" and others will be displeasing or "bad". According to Driver (1975), the underlying assumption here

is that specific satisfying experiences determine the attractiveness of a particular activity or environment to a particular user group and the type of satisfaction realized from an activity gives satisfaction simultaneously, but some give relatively higher amounts of satisfaction than others (Driver, 1975).

Viewing recreation as an experience emphasizes a behavioral approach in defining recreation, rather than the conventional approach of viewing recreation as activity, the process of participating. The behavioral approach is concerned with why a person participates, what they do while participating and what they experience from participation (Knopf et al., 1973). This participation in recreation is viewed as a response to some perceived consequences that are desired. Thus, satisfying experiences are the ultimate products of recreation participation.

Motivation/Determination of Recreation Choice in Fishing

The determination of recreation choice seems to be influenced strongly by events in the non-recreational domain. Knopf's et al. (1973) model of recreation behavior was based on the generic problem solving model of human behavior. The choice of recreation environments and/or activities is strongly influenced by problem states that either cannot be, or for some reasons are not, resolved in non-recreational environments. Choice might be based primarily on curiosity - exploratory preferences for variety or change, the desire to realize preferred levels of skills, to collect status symbols, to develop and maintain social affiliations, or to remove one's self temporarily from adverse work or home environmental conditions. The model proposed that, while recreating, people are relatively free to move in a variety of preferred environments that are chosen because of "problems" experienced prior to the time the choices are made. These problem states define relatively unmet needs that influence the direction, intensity and persistence of recreation behavior as these needs are adjusted by past learning and by personality, environmental and other static and dynamic influences.

Knopf et al. (1973) utilized scales in achievement, affiliation, exploration, dominance, status, experiencing nature, risk-taking, family togetherness, and stress mediation and applied these to samples of participants in several different recreational activities. The results suggested that different activities helped resolve different "packages" of unmet needs. In one study designed to determine why fishermen fish, the results suggested that fishermen are strongly motivated by four unmet needs: (1) temporary escape from stressful conditions in the non-leisure environment, (2) achievement, (3) exploration or seeking out new environments and experiences, and (4) experiencing natural settings - appreciating natural surroundings. However, motivations may vary by different types of fishermen. Types of fishing vary in degree to which they satisfy unmet needs for affiliation. Trout fishermen scored low in affiliation; they preferred not to engage in human interaction. Bank fishermen scored higher in affiliation; for them social interaction was more important. Thus, there are intra- and inter group dimensions to these unmet needs.

Moeller and Engelken (1972), in interviewing 100 fishermen, found that elements of the natural environment - water quality, natural beauty, and privacy while fishing - were consistently rated as the most important factors influencing fishing enjoyment. Size and number of fish caught, weather conditions and ease of access were of

moderate importance, and facilities available were rated as of low importance.

McCullough et al. (1984) studied winter fishing in Missouri's trout parks and noted 4,000 visits during the 1983-84 winter program versus 430,000 visits during the regular trout park season. The researchers pointed out that perhaps the very absence of large crowds was the major strength of the program in that winter fishermen found greater solitude and had more choices as to which stretches of stream to fish, both apparent benefits related to the winter fishing experience. They further suggested that a "special camaraderie" was shared among these participants in that they all had to use flies, and discussions of "what's working best" were of interest to all.

### Social Context of Fishing Motivation

Sociological explanations of correlates of fishing behavior characteristics of the angler are important (Bryan, 1976). For example, different orientations occur by age groups - younger fishermen place greater emphasis on catching fish (but are less successful) while older fishermen place higher value on companionship as a key ingredient in the fishing experience. There are also rural - urban differences. Rural fishermen have an "harvesting attitude" towards nature. Often outdoor recreation values are supported by the homogeneous friendship networks characteristic of rural areas. Friendship group considerations may even be the prime motivator for some outdoor recreation activities.

The social factors pertaining to the motivation of fishermen can be viewed dichotomously. First, there is the need to escape the "stressors" in the home environment; to seek solitude, be alone, get away from people, get away from the family. Second, there is the need to be with others, to socialize through active participation in fishing; to be with family and/or friends, to be with other "like" recreationists with similar values and skills, to meet new people, to share knowledge and skill. A third need can be viewed as a motivation to escape with a small group of family or friends, thus emphasizing intra-group social interaction.

Driver and Knopf (1976) found that although the desire to escape and experience nature was very important to warm water lake fishermen, family togetherness and the opportunity to be with friends was also important. Mandell and Marans (1972) conducted a national survey of over 1,300 households and found with 198 fishermen respondents, 51% designated fishing as providing an escape from the pressures of work as being very important to them for engaging in the activity. However, 42% thought fishing was very important in order to spend more time with the family and 27% in order to be with friends and other people. Motives for leisure involvement are often based on the need for social interaction (Iso-Ahola, 1980).

If fishing satisfies so many motives, why don't most people fish? A available opportunities, time constraints, and what a person is taught on the way toward growing up all seem to affect an individual's motivations to fish (Bryan, 1976).

### The Theory of Recreation Specialization

The theorizing of recreation specialization followed that of Kelly (1974) who viewed leisure as a lifelong process

of socialization or "leisure careers". Bryan (1977) utilized this concept by suggesting that as one progresses through their leisure career they become more skilled and knowledgeable. In other words, a person becomes more specialized throughout their leisure career. Here, recreation specialization has been defined as a continuum of behavior from the general to the particular, reflected by the equipment and skills used in the sport (Bryan, 1979). At one end of the continuum is the person who has more general recreational interests, the generalist/novice. At the other end is the person who denotes or limits interest to some special branch of the sport, the specialist (Bryan, 1977).

Support for Bryan's theory can be seen in the study which examined specialization within and across activities (Donnelly, et al., 1986). The degree of specialization was used to compare within and across activities. The higher the degree of specialization (across or within activities) the more specialized of an activity it was. Here, sailboaters did have a higher degree of specialization than motorboaters. Furthermore, the three subgroups of sailboaters did follow the predicted increases in degree of specialization. Hence, specialization can be seen within the activity of sailing and across activities between sailing and motorized use.

It is important to note that recreationists differ at each level of specialization (Bryan, 1980). These differences are noted in values, motivations, benefits, satisfactions, preferences, etc. These differences within groups are very important to outdoor recreation managers. Historically, survey research has lent itself to determining the average. If only the average is managed for, conflict may result simply because everyone is not average (Shafer 1969). Thus, the objective of specialization research was to develop explanatory principles of recreational behavior based on leisure specialization.

Bryan (1977) studied the specialization of fishermen by grouping them into four categories:

- (1) Occasional fishermen: ones who fish infrequently because they are new to the activity and have not yet established it as a regular part of their leisure repertoire - or perhaps it has not become a major interest. These fishermen prefer to use spinning equipment and emphasize the number of fish caught (the size of the fish does not matter). The places where members of this group fish is insignificant, just as long as it is somewhere that they can catch fish.
- (2) Generalists: fishermen who use a variety of techniques and who fish on a regular basis. The generalists are very similar to the occasional fishermen. The key differences are that size of the fish caught is as important as the number of fish caught. Furthermore, the generalists fish more often.
- (3) Technique specialists: anglers who specialized in a particular method of fishing (flyfishing) largely to the exclusion of other techniques. These fishermen do not place a great emphasis on catching a high number of fish, instead, they are after fewer larger ones.
- (4) Technique-setting specialists: anglers who specialized in a particular method of fishing (flyfishing) largely to the exclusion of other techniques and are more highly committed anglers who prefer fishing a particular type of water.

## Specialization and Socialization

When viewing this typology in light of what Kelly (1974) theorized, social interactions throughout fishing careers is evident. The social context is a major component of fishing as a leisure activity. Social settings range from family outings - the most frequent situation about 63% of occasional anglers - to fishing with peers/companions (54% of the technique-setting specialists) (Bryan, 1979). However, with occasional fishermen, angling is usually secondary to other activities, such as family picnicking/sightseeing. But, for their leisure time, the primary purpose of the trip is fishing, and the individual is more likely to engage in it with peers who have similar interests, values and skills. A fishermen peer group may serve as a reference group as well. Fishing specialists form ties which transcend traditional occupational and class barriers and mold these fishermen into a true leisure social world. Such social worlds are groups of fellow sportsmen that hold similar attitudes, beliefs, and ideologies, engage in similar behavior, and have a sense of group identification.

## Measuring Specialization

Just how specialized is each level of specialization? When measuring specialization difficulties can arise. For example, Wellman, et al. (1982) found few, if any, differences in attitudes toward depreciative behavior between specialization levels of canoeists. One reason for this could have been the fact that the researchers were trying to subdivide a specialization level. Hence, there were no differences found.

Not only is it possible to be too specific, but, it is also possible to be too general. Schreyer and Beaulieu (1986) examined experience and commitment levels in relation to attribute preferences for wildland recreation settings. The results showed that persons at varying levels of experience and commitment do not appear to differ significantly in the types of attributes they identify as important in selecting wildland recreation environments. A reason for this may be that the ninety-eight attribute groups that were identified were consolidated into four categories. These broad categories were most likely to have been limited in their ability to capture the complexity of individual responses.

Precautions need to be taken when defining the specialization classes. As Schreyer and Lime (1984) pointed out, the group that is considered "novices" may not actually be novices. With regard to river floating the novice had typically been defined as anyone who had not floated the study river previously. But, what about people who had floated other rivers? The researchers found that those people who had previously floated other rivers responded more similarly to the experienced group than to the novice group with regard to motivations. When this group of persons with experience on other rivers was summed up with the novice group, the line between the novice and the experienced groups became ambiguous. If the criteria for classifying recreationists is not precise, true differences between groups may not be detected.

In a later study Schreyer, et al. (1984) examined the influence of Experience Use History (EUH) on recreational behavior. EUH represented the amount, type, and diversity of information available to the individual through previous participation. EUH is very similar to the previously tested concept. Thus, the results led to the same conclusions that

previous experience plays a key role in how one should be classified.

## Methodology

The principal investigators theorized that while earlier studies reflected a lack of sociability among trout anglers, the most specialized of anglers, that in fact a dynamic social atmosphere might exist within this activity just as it exists between different fishing specializations in general and that this sociability may change dependent upon changes in the anglers "leisure career."

### Research design

The research framework of this study was a "One - Shot Unequivocal Group Comparison" design which was used to compare the responses of fishermen concerning several specific aspects of their recreational fishing experience (Campbell and Stanley 1966). This research was conducted to determine whether differences exist for fishermen in regard to their level of social interaction as effected by their level of specialization.

While this form of research is limited by its inability to show the changes which occur over time, it does provide the data necessary to adequately describe the actual expressed and perceived motivations and satisfactions of fishermen concerning various aspects of their recreational experience at a specific point in time.

### Data collection methods

The sampling scheme. The study population considered in this research consisted of a sample of 96 Pennsylvania trout fishermen. A specific and very important limitation of this study is that the study was an exploratory study with a relatively small number of respondents. Because of this fact the statistical analysis of the data may not be completely reliable in predicting the responses of the total population. These statistics, should though, be indicative of trends and indicate need for further research in this topical area.

Additionally, the results are only representative of Pennsylvania trout fishermen and are not necessarily representative of other kinds of fishermen or fishermen in other areas. In addition, the results are only representative of the 1989 Pennsylvania trout season and these trout fishermen and may not be representative of other fishing seasons or specialties.

Survey instrument development. To develop an instrument to collect data which would adequately answer the research, data needs were first determined. Upon determining the context of the research, a set of questions which would adequately provide data for answers were developed. The following types of data were needed to adequately address the research objectives; (1) perceived importance of select motivational items to the decision to fish, (2) actual and preferred fishing companions, (3) perceived specialization level, and (4) indicators of actual specialization level. Data of these types provide both direct and indirect measures establishing a triangle approach to interpreting complex data.

To provide a field of valid research questions which would provide viable data for analysis, a number of previously completed research studies which addressed similar objectives were reviewed, and a set of possible

questions were assembled for possible inclusion into this survey instrument. Due to the fact that this survey instrument employed questions which have been well tested in previous studies it was determined that a pre-test would not be necessary.

**Questionnaire administration.** Questionnaires administered in face-to-face interviews with fishermen were conducted by the three principal researchers. Control of sample selection was maintained to avoid sampling bias.

The visitor sample was selected using a modified systematic/stratified random sampling design (Kerlinger 1973; Weisberg and Bowen 1977; Babbie 1982). The randomness of this design was achieved by interviewers systematically contacting each group or individual present on the site during the survey time, in subsequent order as encountered, and randomly selecting one individual from each group to interview. This randomness helped prevent the interview from being dominated by the "group leader" or a member of the group with strong feelings on a particular subject. While dominant individuals may be the most vocal in an interview situation, their perceptions are not necessarily the controlling factor in visitation decisions.

**Treatment of the data**

The first step in data analysis was to compute frequency distributions for the responses to each question (Weisberg and Bowen 1977). A one-way analysis of variance (ANOVA) was then performed on the response data which was gathered on the surveys. Data for all questions pertaining to the independent variable, social interaction, were analyzed using a contrast of responses to each individual question by the dependent specialization variables. The ANOVA determined whether there were statistically significant differences in response means for each dependent variable between the independent variable categories. Thus, the independent variable and degree of importance which measured the dependent variables, were expressed by fishermen through Likert-scale responses. Statistically significant differences for Likert-scale responses were tested in this study at the .05 alpha level (Ott 1980; Weisberg and Bowen 1977).

The specialization index was computed by summing tackle, skill and site. This specialization index was then used as the independent variable with the dependent social interaction variables in the regression analysis (Hammit, Knauf and Noe 1989). The social interaction index was computed by recoding the social interaction variables so direction was the same and then taking the means of all of these variables.

**Results**

Frequencies for indirect measures of specialization, site selected (Table 1) and tackle used (Table 2), showed minimal differences within the study sample. Table 3 reflects the direct measure by the respondents perceived and self reported skill level. This table is generally uniform in nature, but does, however, reflect the restricted N for the study with a low response rate for the second skill level.

TABLE 1  
Frequencies for Respondent Selected Fishing Site  
\*\*\*\*\*

|      | N  | STILL WATER | FAST WATER | TOTAL  |
|------|----|-------------|------------|--------|
| SITE | 96 | 55.2%       | 44.8%      | 100.0% |

\*\*\*\*\*

TABLE 2  
Frequencies for Respondent Selected Tackle  
\*\*\*\*\*

|        | N  | BAIT  | SPIN  | FLY   | TOTAL  |
|--------|----|-------|-------|-------|--------|
| TACKLE | 96 | 38.5% | 24.0% | 36.5% | 100.0% |

\*\*\*\*\*

TABLE 3  
Frequencies for Respondent Selected Tackle  
\*\*\*\*\*

|        | N  | BASIC MODERATE ADVANCED |     |      |      |      | TOTAL  |
|--------|----|-------------------------|-----|------|------|------|--------|
|        |    | 1                       | 2   | 3    | 4    | 5    |        |
| TACKLE | 96 | 15.6                    | 2.1 | 37.5 | 25.0 | 19.8 | 100.0% |

\*\*\*\*\*

Additionally, the frequencies showed specific and surprising differences in the social interaction categories. These frequencies showed that 86.5% of all fishermen were fishing in some form of social group (Table 4) and that 92.8% preferred to fish in some form of social group (Table 5). This is contrary to reported popular belief that fishing is primarily an individual activity. Further research is indicated in this function, possibly to determine if fishermen travel to the site in groups but then separate to fish alone or if the social group function maintains throughout the fishing experience.

TABLE 4  
Frequencies for Who the Respondent was Fishing With.  
\*\*\*\*\*

|     | N  | TOGETHER | ALONE | TOTAL  |
|-----|----|----------|-------|--------|
| WHO | 96 | 86.5%    | 13.5% | 100.0% |

\*\*\*\*\*

TABLE 5  
Frequencies for Whom the Respondent Preferred to Fish with.  
\*\*\*\*\*

|      | N  | TOGETHER | ALONE | TOTAL  |
|------|----|----------|-------|--------|
| WHOM | 96 | 92.8%    | 4.2%  | 100.0% |

\*\*\*\*\*

When the motivation field of questions (indirect) were considered by the type of site selected (indirect), five significant factors were found (Table 6). These tend to indicate that a stronger association of groups is present at the lake sites over the fast running streams. Lake sites return means which are in the upper end of the importance spectrum, while stream site are generally in the mid-range. These data indicate that social relationships are strongest for the lake sites and inconclusive for those fishing on streams. ANOVA for Type of tackle employed was also executed using the motivation variables. Five variables showed significant differences with fly fishermen indicating a preference in social motivation for fishing alone (Table 7)

TABLE 6

Mean Responses to Questionnaire Items Related to Fishing Motivation by Different Types of Sites.

| Motivation                                 | STILL WATER | FAST WATER | F-Probability for Differences in Mean Responses |
|--|-------------|------------|---|
| So the family could do something together. | 3.79        | 2.83       | .008**  |
| For the chance to think about who I am.    | 3.16        | 2.50       | .040*   |
| To be alone.                               | 2.23        | 3.00       | .017*   |
| To get away from other people.             | 2.65        | 3.66       | .003**  |
| To be on my own.                           | 2.26        | 3.33       | .001**  |

\*\*\*\*\*  
\*P≤.05  
\*\*P≤.01  
\*\*\*P≤.001  
N=96

TABLE 7

Mean Responses to Questionnaire Items Related to Motivation by Different Types of Tackle Employed.

| Motivation                                 | BAIT | SPIN | FLY  | F-Probability for Differences in Mean Responses |
|--|------|------|------|---|
| So the family could do something together. | 3.35 | 3.72 | 2.65 | .033**  |
| To be alone.                               | 2.52 | 2.16 | 3.32 | .006**  |
| To get away from other people.             | 2.74 | 2.95 | 3.86 | .015*   |
| To be on my own.                           | 2.68 | 2.38 | 3.53 | .008**  |

\*\*\*\*\*  
\*P≤.05  
\*\*P≤.01  
\*\*\*P≤.001  
N=96

NEXT, social motivations (indirect) as they effect social groups (direct) were recorded. Within this field nine significant motivation questions were discovered (Table 8). These data indicate that individuals who report that they are fishing with friends, family and/or family and friends showed a stronger preference for being with other people than did those individuals who were fishing alone. While the effects of the disproportionate sample group size may be effecting these data the fact that few individuals were found to be fishing alone is also of significance here.

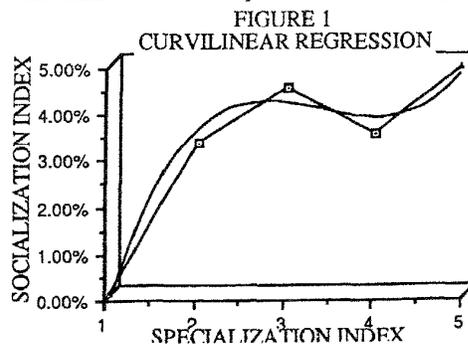
TABLE 8

Mean Responses to Questionnaire Items Related to Fishing Motivation by Who the Respondent is Fishing With.

| Motivation  | ALONE | TOGETHER# | F-Probability for Differences in Mean Responses |
|---|-------|-----------|---|
| So the family could do something together.              | 1.54  | 3.53      | .000***   |
| To be with and observe the other people using the area. | 1.31  | 2.34      | .020*   |
| To be with others who enjoy the same things I do.       | 2.38  | 3.39      | .025*   |
| For the chance to think about who I am.                 | 1.85  | 2.95      | .017*   |
| So I could do things with my companions.                | 2.08  | 3.89      | .000***   |
| It would be a chance to meet new people.                | 1.38  | 2.41      | .016*   |
| To be with people having similar values.                | 2.08  | 3.40      | .002**  |
| To share my skill and knowledge with others.            | 2.15  | 3.06      | .047*   |
| To be on my own.  | 3.69  | 2.72      | .042*   |

\*\*\*\*\*  
# Together signifies with friends, family or family and friends.  
\*P≤.05  
\*\*P≤.01  
\*\*\*P≤.001  
N=96

When specialization was plotted with the social motivation index no direct linear relationship was found (Figure 1). However, upon viewing the scatter plot for this data a startling and significant discovery was made. There appears to be a curvilinear relationship between the socialization index and the specialization index (Figure 1).



The researchers interpreted this relationship to suggest that as specialization increases, social motivations increase, decrease and then increase again. This perhaps reflects a social process of learning a skill. While being taught to fish, one fishes with others. Then, while further developing one's skill, perhaps there is a need to be alone. Finally, when one comes full circle and is now a good angler, they begin to teach others. Hence, an increase in social motivation. The researchers found this relationship to be of considerable significance within the context of this study and believe that this curvilinear relationship may hold a key to social interaction as effected by specialization, one that needs considerable indepth study.

### Summation

Original thoughts about fishing were that it is a recreational activity one practices by one's self, alone, a skill with greater intrinsic rewards than extrinsic. Popular belief, supported by the media by way of advertisement, has depicted the trout fisherman as a solitary individual, stalking the elusive trout in the wilds, relying upon individual skills in solitude. Some research has begun to question whether this depiction of the trout fisherman was true or whether a myth or popular misconception had been spawned, establishing myth as accepted fact.

This research suggests that perhaps a fallacy exists in this belief. Fishermen are social beings and even the most specialized, the trout fisherman, exhibits actual social behavior and expresses motivations to fish in a social environment. Additionally, there may be many additional variables which effect the fishing experience and that specialization and social interaction represent but a few factors of this multidimensional recreational experience of fishing.

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## SPORTFISHING IN NEW YORK STATE:

### TRENDS TOWARD THE YEAR 2010

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Recreational fishing participation in freshwater environments in New York State has steadily increased in the last 20 years. By 1985, 1.1 million anglers fished 21.7 million days and spent \$427 million in trip-related expenditures in New York State. Eighty-five percent of those angler days of fishing were accounted for state residents. Resident participation was segmented by demographic and age groups to establish average rates of use per-capita for New York State residents. The participation rate per cohort (age group) was the basis for projecting the total demand for fishing to the year 2010. The implications of an aging New York State population and a subsequent decline in avidity and total demand are discussed.

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### Introduction

In New York State, the increased participation in sportfishing over the past 20 years is due in part to the successful rehabilitation of the Great Lakes and inland freshwater sportfishery resources. By 1985, 1.1 million anglers fished 21.7 million days and spent \$427 million in trip-related expenditures in New York State (USDI 1989). Twenty-nine percent of the angler days of effort were in the Great Lakes waters of New York State and 71 percent of the angler days were spent in freshwater inland waters of the state (USDI 1989). Trip-related expenditures are important

economic contributions for the recreation and tourism industry within the state and especially the waterfront communities.

In 1985, 85 percent of those angler days of fishing were accounted for by residents who fished in New York State (USDI 1989). The close proximity of the majority of 1985 anglers to the fishery resource is further illustrated by the fact that the average one-way distance traveled per trip for resident anglers was 30 miles for trips to Great Lakes waters and 20.7 miles for trips to inland freshwater locations (USDI 1989).

The aging of the population in the nation and the Great Lakes states has been predicted to produce a 16 percent increase in travel volume in the United States by the year 2000 (U.S. Travel Data Center 1989). However, participation in angling generally declines for the older age groups, which may decrease overall demand for fishing by the year 2000 (Kelly 1987). Similar trends may be experienced in tourism and sportfishing demand in New York State by the year 2000.

The implications of an aging New York State population and subsequent changes in avidity and total angler demand are assessed in this paper. The intent of this paper is to estimate future demand to the year 2010 based on age cohort analysis and to highlight the implications of declining resident angler demand and economic contributions to the waterfront communities in New York State.

### Methods

The data used in this paper were collected in the 1985 National Survey of Fishing, Hunting, and Wildlife Associated Recreation (USDI 1988 and 1989) and included information on the number of days fished in each state during 1985, and the distribution of anglers according to age, race, sex, and state of residence. The New York State area included fishing in inland waters and the New York State waters of the Great Lakes by boat, from shore, or in any connecting bodies of water or tributaries of the state. Only the freshwater fishing days by state residents were used for this analysis which represented 85 percent of the total effort.

The methodology used was age cohort analysis, illustrated recently by Loomis

and Ditton (1988) and the Sport Fishing Institute (1988). Anglers were characterized by three demographic categories of white males (77%), white females (19%), and all non-whites (4%) since these categories represented sufficient 1985 data for an analysis of angler days of effort and they conformed to the available census data from the Sport Fishing Institute (1988). The angler data were segmented into six age cohorts: 16-24, 25-34, 35-44, 45-54, 55-64, and 65 or more. These categories conform to the categories used by the USDI (1988), Loomis and Ditton (1988), and the Sport Fishing Institute (1988). The population forecasts were comparable except for the 16-24 age cohort that was expanded to 15-24 years old to allow for demand projections of that cohort.

The three steps to calculate the demand projections involve:

- 1) Calculation of the 1985 per-capita participation rates for each demographic category and age cohort in the state.
- 2) Determination of the resident population age structures for 1985, 1990, 1995, 2000, and 2010 segmented by each demographic category and age cohort.
- 3) Calculation of the total demand for each year by multiplying the per-capita participation rates by the population of each demographic category and age cohort and summing the results.

This methodology is based on two assumptions (Loomis and Ditton 1988, Sport Fishing Institute 1988): (1) the proportion of the population that fishes in New York State each year will remain approximately the same; and, (2) the age cohort and demographic category per-capita participation rates remain stable over time.

### Results and Discussion

The New York State fishing demand projections for the year 2010 are based on the anglers who fished in and lived in the state. These resident anglers contributed 85 percent of the total New York State freshwater angler days in 1985.

The 1985 distribution of the 21.7 million days of fishing in New York State by state resident anglers varied considerably among the age cohorts (Table 1). The greatest participation was by age cohorts 25-34 and 35-44 and the smallest participation was from age cohorts 55-64 and 65 or more (Table 1). Similarly, the per-capita participation rates are smaller for the 55-64 and 65

or more age cohorts compared to the younger age cohorts with the greatest per-capita participation from the 35-44 age cohort (Table 2).

Table 1. The 1985 Distribution of Freshwater Fishing by New York State Residents by Age Cohort.

| <u>Age Cohort</u> | <u>Total Days</u> | <u>Percent Days</u> |
|-------------------|-------------------|---------------------|
| 15-24             | 3,694,141         | 17.0%               |
| 25-34             | 5,305,445         | 24.4%               |
| 35-44             | 6,751,392         | 31.1%               |
| 45-54             | 2,444,424         | 11.3%               |
| 55-64             | 1,239,969         | 5.7%                |
| <u>65 +</u>       | <u>2,271,529</u>  | <u>10.5%</u>        |
| TOTAL             | 21,706,899        | 100.0%              |

Table 2. The 1985 Population Age Structure and Per-Capita Fishing Participation Rates for New York State Residents by Age Cohort.

| <u>Age Cohort</u> | <u>Population Age Structure</u> | <u>Per-Capita Fishing Days/Year</u> |
|-------------------|---------------------------------|-------------------------------------|
| 15-24             | 5,988,628                       | 0.62                                |
| 25-34             | 6,239,056                       | 0.85                                |
| 35-44             | 4,820,228                       | 1.40                                |
| 45-54             | 3,513,886                       | 0.70                                |
| 55-64             | 3,315,856                       | 0.37                                |
| <u>65 +</u>       | <u>4,582,800</u>                | <u>0.50</u>                         |
| TOTAL             | 28,460,454                      | 0.76                                |

Total demand is a function of cohort size and per-capita participation. The projected demand structure for 1985 through 2010 shifts toward an increasing contribution by older age cohorts (Table 3). The demand structure is a function of an aging population and per-capita participation by each age cohort. The decreasing per-capita participation by older age cohorts tends to decrease their total fishing demand, even though they are increasing dramatically in population size as compared to younger age cohorts (Table 4). The population projections used in this age cohort analysis (Sport Fishing Institute 1988) were considered to be conservative estimates of the aging shifts; higher estimates have been produced by other studies (Schick 1986). Thus, the aging population structure may

actually produce a more dramatic effect on the contribution of each age cohort (i.e., older age cohorts may produce fewer total angler days of demand).

Table 3. The Projected Fishing Demand Structure for New York State Residents in 1985 and 2010 by Age Cohort.

| Age Cohort | Projected Fishing Demand Structure |        |
|------------|------------------------------------|--------|
|            | 1985                               | 2010   |
| 15-24      | 17.0%                              | 14.2%  |
| 25-34      | 24.4%                              | 18.5%  |
| 35-44      | 31.1%                              | 30.2%  |
| 45-54      | 11.3%                              | 17.9%  |
| 55-64      | 5.7%                               | 7.6%   |
| 65 +       | 10.5%                              | 11.7%  |
| TOTAL      | 100.0%                             | 100.0% |

Table 4. The Population Age Structure for New York State Residents in 1985 and 2010 by Age Cohort.

| Age Cohort | Resident Population Age Structure |        |
|------------|-----------------------------------|--------|
|            | 1985                              | 2010   |
| 15-24      | 21.0%                             | 16.8%  |
| 25-34      | 21.9%                             | 15.9%  |
| 35-44      | 16.9%                             | 15.8%  |
| 45-54      | 12.3%                             | 18.5%  |
| 55-64      | 11.7%                             | 15.0%  |
| 65 +       | 16.1%                             | 18.0%  |
| TOTAL      | 100.0%                            | 100.0% |

The total annual demand is projected to gradually increase from 21.1 million days of freshwater fishing by New York State resident anglers in 1980 (USDI 1982) to 24.0 million days by 2000 and then decline to 23.9 million days by 2010 (Table 5). The same trend is projected for both New York's Great Lakes and inland waters. The average annual percent increase will decline over time due to the impact of the aging population (Table 5). This is a cautiously optimistic scenario since more recent demographic studies have reported the possibility that the Great Lakes coastal population may decrease in total numbers by 2010 (Edwards 1989). Although it is not clear how such changes would affect the population within each age cohort, it estimated that total demand would decrease to some

extent for New York's Great Lakes demand.

Table 5. Projected Total Demand for Freshwater Fishing by New York State Residents and Percent Average Annual Demand Change for 1985 through 2010.

| Year | Annual Total Demand | Year Period | Percent Annual Demand Change |
|------|---------------------|-------------|------------------------------|
|      | (Millions)          |             |                              |
| 1980 | 21.1                | N.A.        | N.A.                         |
| 1985 | 21.7                | 1980-85     | 0.53%                        |
| 1990 | 22.8                | 1985-90     | 1.03%                        |
| 1995 | 23.6                | 1990-95     | 0.65%                        |
| 2000 | 24.0                | 1995-00     | 0.36%                        |
| 2010 | 23.9                | 2000-10     | -0.05%                       |

Because the age structure of the population is often closely correlated with fishing and outdoor recreation participation (Charbonneau and Lyons 1980, Kelly 1987) and age data are readily available, age cohort analysis is a useful but limited tool for examining future recreation trends. Age is only one factor that influences recreation participation. The combination of income and the cost of participation, available leisure time, and the quality and quantity of the recreation resource base also affect participation and offer the potential for using more complex projection methods (Brown and Wilkins 1975, Cordell et al. 1985).

In 1985, 29 percent of New York's resident freshwater fishing was spent in Great Lakes waters. Because the production of salmonids is now at peak levels for most of the Great Lakes, any increased participation focused only on harvesting fish, or any setbacks in fish populations (e.g. sea lamprey increases, forage fish decline) and public perceptions of the fishery (e.g., toxic contaminants in fish) will be translated to a decline in the average individual catch rate. These factors could have a dampening effect on future growth in participation in New York's Great Lakes waters.

The projected decline in overall resident fishing license sales in New York State by Connelly and Brown (1989) is another indication that these demand projections for New York State freshwater fishing by residents may be overly optimistic. As Connelly and Brown

note: "since the major influencing factor for long term projections is the 18-44 age population segment, which is expected to decline through 1995, the [regression] model would predict a slight general decline (3 to 4%) in sales by 1995". The relationship between total state fishing license sales and freshwater angling participation is estimated to be closely related.

### Conclusions

In summary, these projections suggest that because of an aging New York State population, resident demand for freshwater angling will increase only marginally through 2000 and then decline slightly by 2010. These angler demand projections are **relatively optimistic** and highlight the observation that an aging state population will result in changes in avidity and little growth, at best, in total demand.

The application of this methodology raises some questions about the need for changing marketing strategies to support continued sportfishery-related participation and economic contributions to waterfront communities. Changes in the age structure and subsequent changes in avidity and total angler demand in New York State suggest the need for expanding the target markets (e.g., women, families, non-white people), the geographic market area (e.g., out-of-state anglers), and the marketing strategies (e.g. emphasize recruiting urban and rural youth) for New York freshwater angling. Additional marketing information will be necessary to determine the angling opportunities sought by these markets and their motivations for participation.

The sportfishing industry makes important economic contributions to waterfront communities and regional economies within the state. Therefore, assessing socioeconomic trends such as changing age structures will help maintain economic stability by anticipating changes in angler demand and suggesting proactive modifications and improvements to the sportfishing marketing strategies and programs.

### Acknowledgments

This research was supported by the Great Lakes Research Consortium with additional support from the New York Sea

Grant Institute and New York Sea Grant Extension Program. This is publication #27 of the Great Lakes Research Consortium.

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