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## LAKE ONTARIO ANGLER SATISFACTION

by

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### INTRODUCTION

The ecosystem of Lake Ontario has changed greatly over the past two decades. A reduction of nearly 40% in total phosphorus in the lake in the 1980s (data from the Canadian Center of Inland Waters), followed by the introduction of the zebra mussel, led to a large decline in zooplankton density. This, in turn, led to substantial declines in smelt and alewife populations by 1991 (Lake Ontario Committee of the Great Lakes Fishery Commission, 1992). As a result, the New York State Department of Environmental Conservation (DEC) decided in 1992 to reduce predatory demand on the declining forage fish stock by 50% through a stepwise reduction in the stocking of salmonines, starting in 1993 (Brandt et al., 1996). The potential impacts of these ecosystem and stocking changes on catch rates and, consequently, angler satisfaction and activity are a concern of fishing-related businesses and tourism promotion agencies.

This study was implemented by Cornell University researchers with funding from the New York Sea Grant Institute in order to determine current levels of angler satisfaction and whether other fishing-related recreation opportunities could compensate for potential changes in catch rates.

### METHODS

To target Lake Ontario anglers, a systematic sample of 1,500 names was drawn from 1993-1994 fishing licenses purchased in five New York counties bordering Lake Ontario (i.e., Oswego, Wayne, Monroe, Orleans, and Niagara). These counties, which had the highest percentages of license buyers fishing Lake Ontario in 1988 of all New York counties (Connelly, Brown & Knuth, 1990), provided the most efficient way to obtain a sample of Lake Ontario anglers. The sample included resident, nonresident, seasonal, and short-term fishing licenses.

A questionnaire was mailed to the sample in early September 1995. Respondents who had fished Lake Ontario or one of its tributaries in 1994 or 1995 were asked to recall specific information about their two most recent trips. Respondents were asked specific details about each trip, including the number, species, and size of fish caught, and if they were fishing from a charter boat. Respondents also rated, on a 10-point scale (1 = very dissatisfied to 10 = very satisfied), their satisfaction with nine different aspects of their fishing trip (Table 1) and their overall satisfaction with their trip. Respondents were then asked how their overall satisfaction would have changed if, in addition, they could have

taken advantage of three different fishing-related recreation opportunities (i.e., a booth for fishing information, a regional fishing museum, and a retail outlet store specializing in fishing equipment) during their last trip.

A statistical analysis (regression analysis) was used to identify which aspects or components of an angler's trip were the most important to his/her satisfaction. Each additional recreation opportunity was then examined to determine if it would compensate for a decreased satisfaction with catch and catch rate.

## RESULTS AND DISCUSSION

### Survey respondents

Of the 1,500 questionnaires mailed, 78 were undeliverable and 838 completed questionnaires were returned. This resulted in an adjusted response rate of 59%.

Approximately 56% of the sample of license buyers fished Lake Ontario or one of its tributaries in 1994 or 1995. Most of them (81%) fished for salmon or trout during that time; 40% fished for species other than salmon and trout.

In an effort to begin tracking the use of the internet by anglers, those who had fished Lake Ontario in 1994 or 1995 were asked if they had access to the internet either at work or at home. More than one-third (37%) of respondents indicated they had access in September 1995, when this study was conducted.

Access did not differ for anglers fishing only for salmon and trout.

### Angler satisfaction with fishing trips

The remainder of this fact sheet deals only with trips anglers took to Lake Ontario or its tributaries to fish primarily for salmon or trout. These results are based on 456 trips, 96 (21%) of which were charter boat fishing trips.

On a 10-point scale (1 = very dissatisfied, 5 = neutral, and 10 = very satisfied), the average overall trip satisfaction for anglers was 7.1. Although this means that the average angler was satisfied with his/her trip to Lake Ontario, individual responses ranged from 1 to 10 (very unsatisfied to very satisfied).

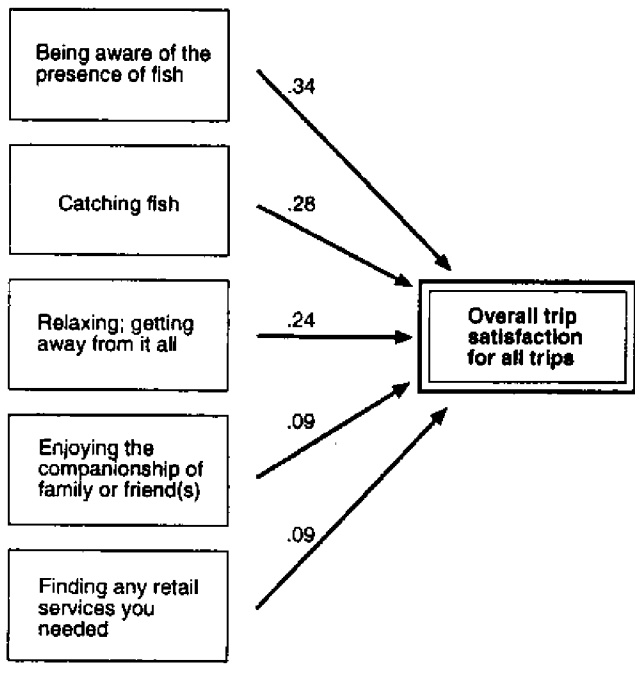
Survey respondents were also asked to rate their satisfaction with nine different aspects or components of their fishing trip (Table 1). While the average angler was satisfied with each of these components, individual responses once again ranged from 1 to 10. Anglers were the least satisfied with catching fish (the average rating was 5.4), and most satisfied with the companionship of family or friends (the average rating was 8.8).

The aspects or components of angler trips that were most important in explaining overall trip satisfaction were also identified (Figure 1). The numbers listed next to each component in Figure 1 identify the relative importance of the component to overall trip satisfaction. While "catching fish" and "being aware of the presence

**Table 1.** Trip-related components and average levels of angler satisfaction with each. Satisfaction was measured on a 10-point scale, where 1 = very dissatisfied and 10 = very satisfied.

Components of Trip	Average Angler Satisfaction
Enjoying the companionship of family or friend(s)	8.8
Relaxing; getting away from it all	8.3
Getting access to where you wanted to fish	8.0
Finding any retail services you needed	7.4
Practicing fishing and/or boating skills	7.3
Having enough room to fish; not being too crowded	7.2
Learning something new about fishing or the aquatic environment	7.0
Being aware of the presence of fish	6.9
Catching fish	5.4

**Figure 1.** A model developed to explain the major components that contribute to overall trip satisfaction for **all trips** to Lake Ontario or its tributaries, primarily for trout or salmon fishing. The numbers (standardized regression coefficients) indicate the relative importance of each component to overall trip satisfaction (i.e., the higher the number, the higher the importance of the component).

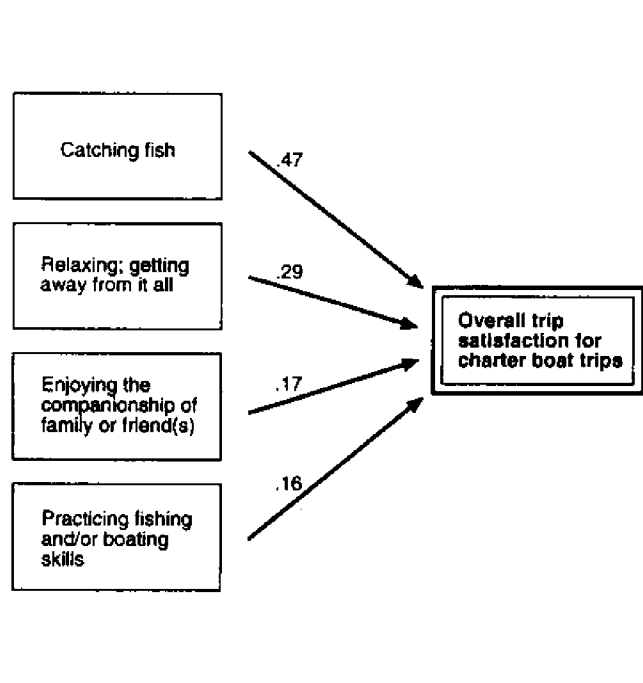


of fish" had two of the highest numbers (indicating they were among the most important factors), "relaxing; getting away from it all" was also important. "Finding any retail service you needed" and "enjoying the companionship of family and friends" had smaller numbers and thus were not as important as the other three components. Components of fishing trip satisfaction that were not statistically significant are not included in Figure 1.

Half of the anglers (51%) who fished for salmon or trout felt that the ban on snagging in Lake Ontario tributaries had no effect on their fishing satisfaction. One-third (32%) felt the ban had increased their fishing satisfaction, whereas 17% felt it had decreased their satisfaction. The majority of anglers (58%) who fished for salmon or trout supported the ban; 21% opposed it and 21% had no opinion.

For anglers reporting trips on charter boats, the key satisfaction components were similar to trips for all anglers (Figure 2). "Catching fish" was the most important component affecting overall satisfaction, while "relaxing and getting away from it all" was second; "enjoying the companionship of family or friends" and "practicing fishing skills" were somewhat less important.

**Figure 2.** A model developed to explain the major components that contribute to overall trip satisfaction for **charter boat trips** to Lake Ontario or its tributaries, primarily for trout or salmon fishing. The numbers (standardized regression coefficients) indicate the relative importance of each component to overall charter boat trip satisfaction (i.e., the higher the number, the higher the importance of the component).



### Importance of catch to overall trip satisfaction

Results indicate that the size of the fish caught by anglers was more closely related to trip satisfaction than the number of fish caught. The average weight of the largest trout or salmon caught on each trip was 14 pounds. A decline of 6 pounds in this average weight would result in a slight decline in overall trip satisfaction. For anglers on charter boat trips (where catching fish was more important than for anglers on all trips), a decline in the size of the catch would result in only slightly more of a decline in satisfaction. On 28% of the trips, no trout or salmon were caught.

### Importance of fishing-related options to satisfaction

Anglers were asked how their overall satisfaction would have changed if one of three fishing-related recreation options (i.e., a booth for fishing information, a regional fishing museum, or a retail outlet store specializing in fishing equipment; Table 2) was available. For 40% to 50% of trips, respondents felt these options would not increase their overall satisfaction. These respondents were more likely to have caught a fish on their trip and

**Table 2.** Potential fishing-related recreation options.

Option A	Visit a booth or kiosk and get free, updated information on the status of Lake Ontario's fisheries and the fishing outlook for the next month.
Option B	For a modest price visit a regional fishing museum that describes and illustrates the history of commercial fishing and sportfishing for that section of Lake Ontario, and how fishing has affected local culture, both historically and today.
Option C	Visit a major nationally-known retail outlet store that specializes in fishing equipment and outdoor clothing.

were generally more satisfied with their overall trip experience than anglers who felt the options would increase their satisfaction.

For 50% to 60% of the trips, anglers said they would experience an increase in satisfaction if one of the options was developed. On average, an increase in overall trip satisfaction of 2.2 to 2.3 points (on a scale of 1 to 10) was expected for each of the three options. For example, an angler having a trip satisfaction of 6.0 **without** the existence of any of the three options, would have a trip satisfaction of 8.2 to 8.3 **with** the existence of one of the options. For anglers on charter boat trips, overall trip satisfaction would increase on average by 2.6 points if they were visiting a regional fishing museum. For both overall trips and charter boat trips, the increase in satisfaction from implementing any of the three options may compensate for the loss in satisfaction resulting from realistic reductions in the average weight of trout and salmon caught. This does not mean that more anglers would come to Lake Ontario for fishing if these options were implemented, only that the trip satisfaction of anglers who did come could increase.

## CONCLUSION

The average angler was generally satisfied with his/her Lake Ontario fishing experiences. While "catching fish" and "being aware of the presence of fish" were two of the most important factors for overall trip satisfaction, "relaxing; getting away from it all" was equally as im-

portant. "Catching fish" was more important to anglers on charter boat trips, indicating that the importance of catch varies by trip type.

Developing fishing-related recreation opportunities such as fishing museums and retail fishing equipment stores may help increase angler satisfaction. For most trips (50% to 60%), anglers said they would experience an increase in satisfaction if one of these options was developed. However, the results from this study do not indicate that more anglers will come to the Lake Ontario region to fish if these options were implemented, only that the trip satisfaction of anglers who did come would increase. The development of a regional fishing museum may be the best option to pursue to provide additional satisfaction to anglers, since results indicate that this option would increase trip satisfaction for anglers on all trips (including charter boat trips).

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