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A MARKET SEGMENTATION OF NEW YORK'S GREAT LAKES ANGLERS

Tommy L. Brown

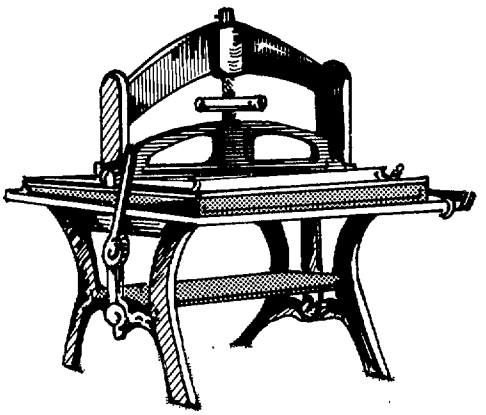

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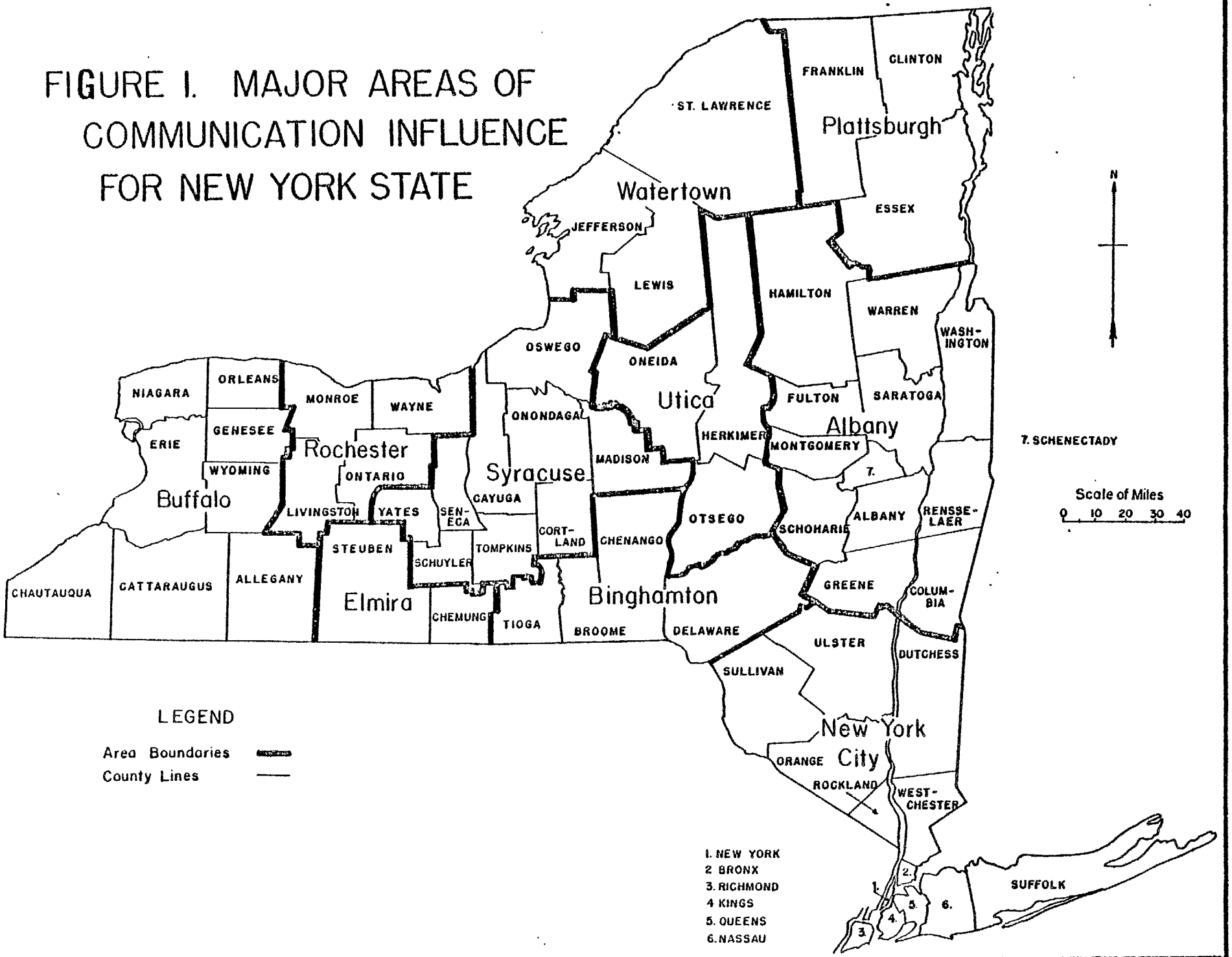
FIGURE I. MAJOR AREAS OF COMMUNICATION INFLUENCE FOR NEW YORK STATE



ABSTRACT

New York's Great Lakes fisheries make a substantial contribution to the economic base of Great Lakes communities. With expanded development of these fisheries and related facilities, Great Lakes communities have additional potential to capitalize. This study identifies the primary residence areas or markets of anglers who fish the various sections of New York's Great Lakes-St. Lawrence River system. It also provides information about the characteristics and preferences of anglers by major residence areas. This information should enhance the ability of recreational businesses and communities to market Great Lakes fishing.

INTRODUCTION

New York's Great Lakes fisheries are among the best in the state for both warmwater and coldwater species. The system of Lakes Erie and Ontario, the Niagara River, and the St. Lawrence River accounted for approximately 17.5% of total freshwater angler days and 23.5% of the total harvest in New York in 1976-77 (derived from Kretser and Klatt 1981). Only Oneida Lake interrupts the ranking of these waters as tops in the state (Table 1).

Table 1 Top five Waters of New York Ranked by Total Estimated Harvest for All Species and Angler Days Generated, 1976-77

Waterway	Total Harvest	(Rank)	Angler Days	(Rank)
Lake Ontario	6,473,000	(1)	1,027,000	(1)
St. Lawrence River	4,406,000	(2)	702,800	(3)
Oneida Lake	3,582,000	(3)	703,400	(2)
Niagara River	2,417,000	(4)	515,700	(5)
Lake Erie	2,325,000	(5)	663,000	(4)

Source: Kretser and Klatt 1981.

Fishing, boating, and other water-oriented activities are not only popular on the Great Lakes coastline; they are extremely important to the economics of coastal communities. The Thousand Islands area and the coast of northeastern Lake Ontario have historically been vacation and second home communities whose economies have depended heavily on tourism. The remainder of the Great Lakes system (with the exception of Niagara Falls) has been characterized generally by underutilized but keen recreational interest and steady efforts at development (e.g., see

Schuman, Brown, and Duttweiler 1979). These efforts have centered around the Great Lakes salmonid stocking program and the construction of new waterfront facilities to enhance fishing and boating access.

Tourism development has gained considerable interest at the local level as a result of the above programs. This interest has been additionally heightened by the state's "I Love New York" tourism promotion program and by matching funds made available from the Department of Commerce to counties for tourism promotion. These funds, which have amounted to up to $1 million per year statewide through 1980, have recently been doubled to $2 million by the state legislature. The availability of these state matching funds has enabled smaller rural counties and other counties which traditionally have not relied heavily upon tourism to initiate programs or strengthen existing ones.

A significant problem at the local or regional level, given an interest in tourism development and funds for mounting or extending promotional efforts, is knowing how to promote the program. Successful tourism marketing has numerous dimensions, including the choice of what attractions to promote, what media to use, and which segments of the population to aim promotional materials toward. Prerequisite to these decisions, however, is the decision of which geographic markets to aim the advertising toward. The primary objective of this study was to determine the best geographic markets for water-related activities in the various regions of New York's Great Lakes system. In addition, socioeconomic and fishing preference analyses were undertaken to characterize these geographic markets.

METHODS

The data base for this study is the 1976-77 DEC statewide angler study (Kretser and Klatt 1981). This study was conducted by mail questionnaire in 1977, and covered fishing during the 12-month period of April 1, 1976 through March 31, 1977. A total of 25,564 questionnaires randomly distributed by county were used for the survey; 11,721 anglers responded (46%), of which 10,400 were usable. Expansions of angler days, harvest, and expenditures were weighted for nonresponse bias as determined in a similar survey by Brown (1976) in 1973.

From the statewide data set, a subfile of all respondents who took at least one trip to a county bordering the Great Lakes was obtained from the NYS Department of Environmental Conservation. Additional subfiles were created as needed for this analyis.

The dimension of market segmentation analysis so important to local and regional entities is the definition and analysis of their angler clientele by meaningful media markets. Most advertising is done by mass media which serve a multi-county area. If information on angler effort and expenditures is available by media markets in which anglers reside, Great Lakes communities can assess that information and determine the media markets where they should focus their advertising.

The application of media markets to tourism was pioneered by Gray (1976) and used in an assessment of the market potential of hotels-motels-resorts (1977) and campgrounds (1977). Information on the market size and distribution of such media markets as television,

radio, and newspapers is available commercially from Standard Rate and Data Service, Inc. of Skokie, Illinois on an annual basis.

Based on information from Standard Rate and Data Service, Inc., New York State was divided into 10 media market areas (Figure 1) which will be called Areas of Communication Influence (ACIs) as termed by Gray. These ACIs are delineated in such a way that the majority of households with television sets in any county of New York located within the ACI tune primarily to stations in the cities used in the name of the ACI. Furthermore, the metropolitan newpapers of the ACI are read by at least 20% of the residents of each county in the ACI, and by more than those of any other ACI.

As an illustration, Tompkins County is placed in the Syracuse ACI. The majority of Tompkins County television viewing is via Syracuse television stations. Furthermore, Syracuse newspapers are read at least weekly by a minimum of 20% of Tompkins County households. More Tompkins County residents read Syracuse newspapers than those in any other ACI. Therefore, the regional media which will reach the most Tompkins County households are those of Syracuse. However, more people in Tompkins County read Ithaca newspapers and listen to Ithaca radio stations than use the corresponding Syracuse media. Therefore, while an advertiser who wanted to reach the Syracuse ACI would easily reach the most people through Syracuse media, the advertiser should consider supplementing with local newspaper and radio advertising to maximize coverage in any important counties on the periphery of the ACI.

The DEC angler survey permits a market analysis of two St. Lawrence River destinations bordering St. Lawrence County and Jefferson County, of each of the seven counties bordering Lake Ontario from Jefferson on the east to Niagara on the west, and of two Lake Erie destinations bordering Erie and Chautauqua counties. Totals are also presented to permit a comparative analysis of each destination.

For each Great Lakes destination county/waterway, the market analysis presents two parameters for both angler days and destination expenditures by residence ACI of anglers. Total angler days and total destination expenditure provide an absolute measure of the contribution of each ACI to each Great Lakes destination. Sometimes the ACI contributing the greatest number of angler days is not the one making the largest economic contribution; this comparison is important in planning marketing strategies. In addition, a relative measure of angler days and expenditures per thousand licenses sold is provided for each residence ACI. These measures indicate the relative popularity and attraction of expenditures of ACIs independent of their licensed angler populations.

Two important variables which influence the attraction of anglers and other tourists are the distance they have to travel and the number (and type) of competing quality fisheries which lie a shorter distance from their home than any specific Great Lakes destination. Explanatory models of the gravity type among others, have been developed to quantify and explain recreational travel for various forms of recreation to specific locations (e.g., Freund and Wilson 1974). Such

models are not pursued in this study beyond a brief regional comparison because our purpose is rather to provide a market segmentation analysis. It should be noted however that demand, in number of anglers per thousand population, typically decreases with distance. We would not expect as many anglers from New York City as from Rochester to visit any portion of Lake Ontario, strictly because of the distance factor.

Although explanatory models accounting for distance from the various ACIs to Great Lakes destinations are not pursued in this study, it is quite clear that a declining distance function is not always observed for a given ACI versus all others in relation to a given Great Lakes destination. Notable exceptions are pointed out in the report.

Following the presentation of the primary ACIs which contribute anglers and dollars to the various Great Lakes, a market analysis of anglers in each ACI is presented. This analysis presents socioeconomic characteristics and fishing preference information for anglers residing in those leading ACIs who visit particular Great Lakes destinations.

REGIONAL COMPARISON OF THE GREAT LAKES FISHING DESTINATIONS

New York's Great Lakes fisheries generated an estimated 2.7 million angler days, with expenditures in the destination area of over $15.3 million in 1976-77[1] (Table 2). Each of the four Great Lakes waterways generated at least half a million angler days.

The St. Lawrence River fisheries generated the largest total destination expenditures, although angling effort was approximately one-third greater on Lake Ontario. About half of Lake Ontario angler days were spent in the eastern basin (Jefferson and Oswego counties); these anglers accounted for 72% of the lake's destination expenditures. Lake Erie and the Niagara River combined account for over 40% of total angler days of New York's Great Lakes system, largely because of their proximity to the metropolitan Buffalo area. These Western New York fisheries accounted for nearly $3 million in local expenditures, although the daily expenditure rate was only in the $2.00 to $3.00 range.

Because the proportion of angler days on the Niagara River originating outside the Buffalo SMSA is only about 1%, the Niagara River is excluded from further analysis.

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[1] It should be noted that the author has used a slightly different expansion method from that of Kretser and Klatt. If any angler trip by a given respondent contained missing data, Kretser and Klatt coded all trips by that angler as missing data. In this study, individual trips by such an angler which are completely described are part of the data base. This results in expansion estimates for this study which are less than those of Kretser and Klatt, though not by a constant factor.

Table 2 Angler Day and Expenditure Estimates for New York's Great Lakes System, 1976-77

Waterway/ County	Angler Days	Expenditures at Destination Total	Per Angler Day
St. Lawrence River	666,500	$6,940,000	$10.42
St. Lawrence	231,200	1,672,000	7.23
Jefferson	435,300	5,268,000	12.10
Lake Ontario	957,300	5,540,000	5.79
Jefferson	345,200	3,262,000	9.45
Oswego	145,800	730,000	5.01
Cayuga	50,700	201,000	3.96
Wayne	208,600	710,000	3.40
Monroe	126,500	386,000	3.05
Orleans	32,600	108,000	3.31
Niagara	47,900	143,000	2.99
Lake Erie	613,100	1,853,000	3.02
Erie	519,200	1,691,000	3.26
Chautauqua	93,900	162,000	1.73
Niagara River	510,700	1,013,000	1.98
Great Lakes Totals:	2,747,600	15,346,000	5.59

In an attempt to measure the relative attractiveness of the 11 Great Lakes fisheries regions used in this study to anglers, an attractiveness ratio was calculated which weighs the total number of angler days at each destination by the mean travel distance and the miles of shoreline. The formula used is:

$$A_i = \frac{days_i}{Days} \times \frac{dist_i}{Dist} \times \frac{Miles}{miles_i}$$

Where

A_i = attractiveness ratio of site i

$days_i$ = total angler days at site i

Days = mean number of angler days at the 11 destination sites

$dist_i$ = mean distance traveled to $site_i$

Dist = mean distance traveled to all sites

Miles = mean shoreline distance of the 11 sites

$miles_i$ = miles of shoreline of $site_i$

The concept of the ratio is to create an index of relative popularity of the various sites revolving around 1.0 which holds the size of the area constant and which gives due recognition to sites which people are willing to travel greater distances to reach. This ratio treats the distance function linearly. Other geographic and planning models have used the linear function as a simplication (e.g., Berry and Marble 1968, Izard 1976). When both short and very long distances are considered, the functional relationship between angler days and distance at most Great Lakes sites is logarithmic. However, the vast majority of trips ranging from 15 to 150 miles can be closely approximated mathematically via linear functions.

The highest relative popularity of the Thousand Islands area for fishing is evidenced from the attractiveness ratio of 3.27 for that area (Table 3). The number of angler days per mile visiting this portion of the St. Lawrence is just over half that of the Erie County portion of Lake Erie, but the mean distance traveled to the St. Lawrence, 103 miles, compares to only 12 miles for Erie County.

The attractiveness ratio also puts the small shoreline of Cayuga County into perspective. Although it attracts the least number of anglers of any county on Lake Ontario, it attracts 6,338 anglers per mile annually, and anglers travel an average distance of 79 miles. As a result, the attractiveness ratio of .72 is the highest on Lake Ontario west of Jefferson County, and is comparable to that of the St. Lawrence County portion of the St. Lawrence River.

The low attractiveness ratios of western Lake Ontario counties and Chautauqua County on Lake Erie reflect in large part a lack of adequate access facilities, fisheries that were very much in the development stages in 1976-77 (especially western Lake Ontario), and close proximity to Buffalo, which easily leads all cities in New York in the number of licensed anglers. The location of these counties prohibits an average travel distance substantially greater than the current level, but the potential for fisheries which attract 3,000 to 4,000 anglers per mile seems quite viable given continued development of the fisheries and access facilities.

Table 3 Mean Distance Traveled, Miles of Shoreline, Angler Days per Mile and Attractiveness Ratio for Great Lakes Destinations

Waterway/ County	Mean Mileage	Miles of Shoreline	Angler Days per Mile	Attractiveness Ratio
St. Lawrence River				
St. Lawrence	124	77	3,003	0.70
Jefferson	103	52	8,371	3.27
Lake Ontario				
Jefferson	54	64	5,394	1.46
Oswego	43	33	4,418	0.63
Cayuga	79	8	6,338	0.72
Wayne	18	41	5,088	0.49
Monroe	19	35	3,614	0.31
Orleans	30	24	1,358	0.13
Niagara	17	32	1,497	0.13
Lake Erie				
Erie	12	33	15,733	1.61
Chautauqua	30	41	1,168	0.12

St. Lawrence River Anglers

St. Lawrence County

The local Watertown ACI contributed the largest proportion of angler days to the St. Lawrence County section of the St. Lawrence River (about 37%). Syracuse and Rochester ranked second and third, respectively (Table 4). These areas sent more than the statewide average of 378 angler days per thousand licenses sold to this portion of the St. Lawrence; the Binghamton ACI fell just below this average.

The pattern of angler expenditures to this area was considerably different. Rochester and Buffalo, the two leading ACIs, together contributed $577,000 or 35% of angler expenditures to localities along this portion of the St. Lawrence. Anglers from five other ACIs as well as those from out of state contributed over $100,000 to local economies. Expenditures per thousand licenses sold were highest from the Binghamton and Rochester ACIs.

Anglers who fished in St. Lawrence County are largely male, as is typical of New York's Great Lakes anglers, but a much higher proportion of the spouses of St. Lawrence County anglers fish. Each major market zone is above the Great Lakes average of 39% of anglers whose spouses fish, and the 61% figure for Rochester ACI anglers is the highest for any Great Lakes ACI (Table 5). Since almost all children of these anglers also fish, it is clear that this portion of the St. Lawrence River can be effectively promoted as a family recreation opportunity.

Table 5 indicates substantial differences between Watertown ACI anglers and those from Syracuse and Rochester who fish the St. Lawrence. Those from Watertown had average incomes and education

levels which were among the lowest of Great Lakes anglers. One-third indicated either perch, panfish, or bullheads as their preferred species to fish for. Over one-third Rochester and Syracuse ACI anglers, on the other hand, preferred to fish for bass, and over one-fourth of the Rochester anglers indicated a preference for muskellunge or northern pike. Over 10% of each ACI indicated a preference for trout and for walleyed pike.

Table 5 Profile of St. Lawrence River Anglers, St. Lawrence County By Major Residence Market

Characteristics	Major Residence Market Zones		
	Watertown	Syracuse	Rochester
% Male	87	89	88
% Spouse Fishes	44	51	61
% Children Fish	96	89	94
Age (Mean)	40	41	39
Years Fished (Mean)	27	30	26
Sports Club Member (%)	15	19	22
Education (Mean Years)	12.4	13.3	14.0
1976 Household Income (Mean, $000's)	13.1	19.7	20.3
Preferred Species to Fish For (%)			
Bass	8.4	34.9	38.9
Walleye	19.0	18.6	13.9
Musky/N. Pike/Pickerel	17.8	18.7	27.8
Salmon/Trout	21.5	20.9	11.2
Perch/Panfish	14.3	7.0	5.6
Bullheads	19.0	0	0

Jefferson County

The vast majority of anglers who fished the Thousand Islands area of the St. Lawrence were tourists; only 11% of these total angler days originated in the local Watertown ACI. Rochester was easily the leading ACI, providing 32% of all angler days, or almost twice that of Syracuse, the second leading ACI. The strong relative attraction of an area as distant from the Thousand Islands as Rochester is highly unusual. Typically, the number of angler days per thousand licenses sold for origin (residence) zones decreases with distance. The estimated mean distance of 168 miles from the Rochester ACI to the Thousand Islands area is far greater than that from Watertown (32 miles), and substantially greater than that from Syracuse (103 miles), or Utica (123 miles). Yet the 2,413 angler days per thousand licenses sold in the Rochester ACI is 64% greater than that of the Watertown ACI.

Rochester ACI anglers spent over $1.7 million in the Thousand Islands area (Table 6), or 32% of all angler expenditures. The next largest expenditure totals came from the Syracuse and Buffalo ACIs. Considering the licensed angler population of the various market areas, however, Rochester was followed by the Utica and Binghamton ACIs.

Although fewer spouses of anglers visiting the Jefferson County portion of the St. Lawrence fished, the range of 33% from the Syracuse to 41% from the Rochester ACI, suggests that the area can be marketed for family fishing. The finding that over 90% of the children of these anglers fished supports this suggestion (Table 7). The incomes of Rochester and Syracuse ACI anglers were among the highest of all

residence groups studied. As a result, moderately priced goods and services such as vacation or weekend lodging, fishing package plans, guide services, and fishing equipment may be marketed toward these anglers and their families.

A plurality of Rochester and Watertown residents preferred bass fishing (47% and 40%, respectively). Syracuse residents visiting the St. Lawrence were roughly evenly divided as to preference for salmon and trout, muskellunge/northern pike/pickerel, bass, and walleye (Table 7).

Table 6 . Effort and Expenditure Data for St. Lawrence River, Jefferson County Anglers by Residence Market Zones, 1976-77

Residence ACI	Angler Days Total (000's)	Angler Days Per Thousand Licenses Sold	Destination Expenditures Total (000's)	Destination Expenditures Per Thousand Licenses Sold
New York City	23.3	196	$ 408	$3,425
Albany	8.7	94	301	3,242
Plattsburgh	0.2	9	4	141
Binghamton	27.9	854	295	9,023
Utica	29.9	984	311	10,220
Watertown	48.1	1,470	270	8,253
Syracuse	72.4	905	676	8,445
Elmira	9.2	533	120	6,964
Rochester	139.3	2,413	1,724	29,860
Buffalo	41.3	398	652	6,280
New York Totals	400.4	676	4,759	8,040
Out of State	34.9	*	509	*
Totals	435.3	*	$5,268	*

*Available for New York data only.

Table 7 Profile of St. Lawrence River Anglers, Jefferson County By Major Residence Market Zones

Characteristics	Major Residence Market Zones		
	Rochester	Syracuse	Watertown
% Male	82	82	86
% Spouse Fishes	41	33	45
% Children Fish	91	92	99
Age (Mean)	42	42	44
Years Fished (Mean)	29	30	33
Sports Club Member (%)	15	19	22
Education (Mean Years)	13.4	13.4	13.4
1976 Household Income (Mean, $000's)	20.0	19.0	13.2
Preferred Species to Fish For (%)			
Bass	47.1	21.6	40.0
Walleye	5.1	19.4	8.0
Musky/N. Pike/Pickerel	17.2	24.8	14.0
Salmon/Trout	18.4	24.9	16.0
Perch/Panfish	10.2	7.5	12.0
Bullheads	1.9	1.1	10.0

Lake Ontario Anglers

Jefferson County

The 345,200 angler days spent on the Jefferson County portion of Lake Ontario easily tops the level of angling effort on any other Great Lakes county segment. The largest portion of total angler days, about 58%, originated in the Rochester and Watertown ACIs. As is true of the Jefferson County portion of the St. Lawrence River, more angler days originated from the Rochester ACI than from the local Watertown ACI (Table 8). However, Watertown provided the greater amount of effort per thousand licenses sold for the Jefferson County segment of Lake Ontario.

In terms of local expenditures almost one-third came from Rochester and 26% came from Syracuse ACI anglers. Buffalo ACI and out-of-state anglers also made expenditures in excess of $250,000 (Table 8).

Table 9 suggests that the Lake Ontario portion of Jefferson County had similar potential to the St. Lawrence River portion as a family fishing destination; 33% to 42% of spouses and 87% to 97% of children fished. Income levels were also similar to those on the St. Lawrence River—quite high for Rochester and Syracuse ACI residents, and relatively low for the local Watertown area.

Roughly half of the Rochester and Watertown ACI anglers indicated bass as their preferred species to fish for; no other species group was the first preference of as many as 20%. Syracuse ACI anglers were more evenly divided as to preference between bass fishing (33%) and salmon and trout fishing (28%) (Table 9).

Table 8 Effort and Expenditure Data for Lake Ontario, Jefferson County Anglers by Residence Market Zones, 1976-77

Residence ACI	Angler Days Total (000's)	Angler Days Per Thousand Licenses Sold	Expenditures Total (000's)	Expenditures Per Thousand Licenses Sold
New York City	2.0	17	11	94
Albany	2.0	21	24	259
Plattsburgh	0.6	25	14	568
Binghamton	9.4	288	118	3,597
Utica	16.3	538	119	3,876
Watertown	98.3	3,005	445	13,605
Syracuse	75.1	939	843	10,540
Elmira	1.4	79	2	105
Rochester	100.7	1,744	1,042	18,053
Buffalo	24.7	238	357	3,440
New York Totals	330.5	558	2,974	5,025
Out of State	14.7	*	288	*
Totals	345.2	*	3,262	*

*Available for New York data only.

Table 9 Profile of Lake Ontario Anglers, Jefferson County by Major Residence Market Zones

Characteristics	Major Residence Market Zones		
	Rochester	Syracuse	Watertown
% Male	78	81	89
% Spouse Fishes	33	42	39
% Children Fish	90	87	97
Age (Mean)	49	44	45
Years Fished (Mean)	38	30	32
Sports Club Member (%)	17	19	32
Education (Mean Years)	13.1	13.6	13.1
1976 Household Income (Mean, $000's)	20.3	19.2	13.0
Preferred Species to Fish For (%)			
Bass	55.1	33.1	49.3
Walleye	1.1	10.3	2.7
Musky/N. Pike/Pickerel	10.2	8.8	9.6
Salmon/Trout	15.9	28.1	11.0
Perch/Panfish	16.1	16.1	17.8
Bullheads	1.1	4.4	9.6

Oswego County

Approximately 77% of angler days fished in the Oswego County portion of Lake Ontario originated in the local Syracuse ACI. No other ACI contributed as much as 10% of total angler days.

The Syracuse ACI accounted for $433,000 (Table 10), or 59% of on-site angler expenditures in the Oswego County portion of Lake Ontario. Estimates of $63,000 to $75,000 were spent by anglers from the Rochester, Binghamton, and Albany ACIs, although it should be noted that these estimates are drawn from small sample sizes and may be subject to large sampling errors. If these estimates are accurate, the angler expenditures attracted from Binghamton and Utica exceeded the average rate of expenditure statewide in Oswego County, in dollars per thousand licenses sold.

Syracuse ACI angling visitors to Oswego County were younger than most residence segments, with a mean age of 38 years. Their mean 1976 income of $17,100[1] was moderately high, but about $2,000 lower than that of somewhat older Syracuse anglers who fished Jefferson and St. Lawrence counties. Nearly one-third of spouses and 84% of children fished (Table 11); this suggests a moderately strong family fishing market.

Salmon and trout, easily the leading species group preference, was the first preference of 42% of Syracuse anglers (Table 11). Walleye and bass ranked second and third, respectively.

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[1] To convert 1976 dollars to 1981 dollars, multiply by the factor 1.58.

Table 10 Effort and Expenditure Data for Lake Ontario, Oswego County Anglers by Residence Market Zones, 1976-77

Residence ACI	Angler Days Total (000's)	Angler Days Per Thousand Licenses Sold	Expenditures Total (000's)	Expenditures Per Thousand Licenses Sold
New York City	0.4	3	9	74
Albany	11.1	120	75	803
Binghamton	7.0	216	74	2,278
Utica	6.8	223	37	1,209
Watertown	0.4	11	4	110
Syracuse	112.0	1,400	433	5,411
Elmira	0.4	21	7	387
Rochester	5.7	99	63	1,083
Buffalo	0.3	3	2	17
New York Totals	144.0	244	702	1,186
Out of State	1.8	*	28	*
Totals	145.8	*	730	*

*Available for New York data only.

Table 11 Profile of Lake Ontario Anglers, Oswego County by Major Residence Market Zones

Characteristics	Major Residence Market Zones
	Syracuse
% Male	97
% Spouse Fishes	32
% Children Fish	84
Age (Mean)	38
Years Fished (Mean)	27
Sports Club Member (%)	19
Education (Mean Years)	12.8
1976 Household Income (Mean, $000's)	17.1
Preferred Species to Fish For (%)	
Bass	15.6
Walleye	19.3
Musky/N. Pike/Pickerel	8.1
Salmon/Trout	42.2
Perch/Panfish	8.8
Bullheads	5.9

Cayuga County

The vast majority of angler trips to the less than 10 mile shoreline of Cayuga County originated from the local Syracuse (47.9%) or from the Rochester ACI (45.2%). On a relative basis (angler days per thousand licenses sold), Cayuga County drew more heavily from Rochester than from Syracuse.

The Rochester ACI provided two-thirds of all destination angler expenditures in Cayuga County. Syracuse is the only other ACI which provided as much as 10% of total expenditures.

Syracuse and Rochester ACI anglers fishing the Cayuga County shorelines had mean income levels of approximately $14,000 in 1976 (or $22,000 in 1981 dollars), somewhat lower than that of anglers from the same area who fished Eastern Lake Ontario and the St. Lawrence River. The 32% female anglers from Rochester was the highest percent of any ACI-Great Lakes segment; this combined with the information that virtually all households of these anglers have children who fish suggests that the area can be successfully marketed for family fishing (Table 13).

Table 13 suggests notable differences in the species preferences of Rochester versus Syracuse ACI residents who fished the Cayuga County shoreline. Almost 44% of Rochester area anglers prefer bass fishing, while about 19% each prefer salmon and trout, and perch/panfish. The largest proportion of Syracuse anglers, 35.5%, preferred to fish for salmon and trout, while 29% preferred bass. Notable interest was expressed in bullhead fishing by both Syracuse and Rochester ACI residents, and in warmwater game fishing (primarily northern pike) by Syracuse ACI residents.

Table 12 Effort and Expenditure Data for Lake Ontario, Cayuga County Anglers by Residence Market Zones, 1976-77

Residence ACI	Angler Days Total (000's)	Angler Days Per Thousand Licenses Sold	Expenditures Total (000's)	Expenditures Per Thousand Licenses Sold
Albany	0.3	3	3	24
Binghamton	1.3	39	4	133
Utica	0.2	6	2	59
Syracuse	24.3	304	39	482
Rochester	22.9	397	134	2,325
Buffalo	1.4	14	15	141
New York Totals	50.4	85	196	340
Out of State	0.3	*	5	*
Totals	50.7	*	201	*

*Available for New York data only.

Table 13 Profile of Lake Ontario Anglers, Cayuga County by Major Residence Market Zones

Characteristics	Major Residence Market Zones	
	Syracuse	Rochester
% Male	74	68
% Spouse Fishes	38	37
% Children Fish	95	99
Age (Mean)	35	42
Years Fished (Mean)	27	28
Sports Club Member (%)	19	11
Education (Mean Years)	13.8	12.8
1976 Household Income (Mean, $000's)	14.3	13.8
Preferred Species to Fish For (%)		
Bass	29.0	43.8
Walleye	6.5	0
Musky/N. Pike/Pickerel	12.9	6.3
Salmon/Trout	35.5	18.9
Perch/Panfish	0	18.8
Bullheads	16.1	12.5

Wayne County

The Wayne County portion of Lake Ontario is essentially a fishery for the local Rochester ACI; 98% of both angler days and destination expenditures originated in the Rochester ACI. Approximately 3,400 angler days originated in the Syracuse ACI, and approximately 900 angler days originated out of state. Angler expenditures in the county were approximately $710,000 (Table 14).

Rochester ACI anglers visiting Wayne County had moderately high average incomes. Although 85% were male, 37% had spouses who fish, and 98% of their households had children who fish. These anglers were split as to species preference; about one-third preferred to fish for salmon/trout and one-third for bass. Other preferences are shown in Table 15.

Table 14 Effort and Expenditure Data for Wayne County Anglers by Residence Market Zones, 1976-77

	Angler Days		Expenditures	
Residence ACI	Total (000's)	Per Thousand Licenses Sold	Total (000's)	Per Thousand Licenses Sold
Syracuse	3.4	43	11	140
Rochester	204.2	3,537	696	12,054
New York Totals	207.7	351	707	1,195
Out of State	0.9	*	3	*
Totals	208.6	*	710	*

*Available for New York data only.

Table 15 Profile of Lake Ontario Anglers, Wayne County by Major Residence Market Zones

Characteristics	Major Residence Market Zones
	Rochester
% Male	85
% Spouse Fishes	37
% Children Fish	98
Age (Mean)	39
Years Fished (Mean)	33
Sports Club Member (%)	16
Education (Mean Years)	13.0
1976 Household Income (Mean, $000's)	17.5
Preferred Species to Fish For (%)	
Bass	32.9
Walleye	4.8
Musky/N. Pike/Pickerel	11.1
Salmon/Trout	32.6
Perch/Panfish	11.2
Bullheads	6.4

Monroe County

The Monroe County Lake Ontario fisheries are primarily local; 119,100 out of 126,500 angler days (94%) originated from the Monroe County ACI (Table 16). Similarly, 92.5% of all expenditures came from anglers residing within the Rochester ACI. The only other ACI of note was Buffalo, which contributed 5,300 angler days and $17,000 in local expenditures.

The mean household income of these Rochester ACI anglers was $18,200 in 1976, or about $28,700 in 1981 dollars, among the higher income levels of Great Lakes anglers. Although 90% of responding anglers were male, 33% had spouses who fish, and 86% of the households had children who fish. Slightly over one-third listed salmon and trout as their preferred species to fish for, while slightly under one-third preferred bass. Other preferences are shown in Table 17.

Table 16 Effort and Expenditure Data for Lake Ontario, Monroe County Anglers by Residence Market Zones, 1976-77

Residence ACI	Angler Days Total (000's)	Angler Days Per Thousand Licenses Sold	Expenditures Total (000's)	Expenditures Per Thousand Licenses Sold
Binghamton	0.1	3	5	138
Utica	0.1	3	*	12
Syracuse	1.2	15	4	45
Rochester	119.1	2,063	357	6,187
Buffalo	5.3	51	17	166
New York Totals	125.9	213	383	647
Out of State	0.6	**	3	**
Totals	126.5	**	386	**

* Too small to be estimated.
** Available for New York data only.

Table 17 Profile of Lake Ontario Anglers, Monroe County, By Major Residence Market Zones

Characteristics	Major Residence Market Zones
	Rochester
% Male	90
% Spouse Fishes	33
% Children Fish	86
Age (Mean)	39
Years Fished (Mean)	31
Sports Club Member (%)	12
Education (Mean Years)	13.3
1976 Household Income (Mean, $000's)	18.2
Preferred Species to Fish For (%)	
Bass	31.0
Walleye	5.0
Musky/N. Pike/Pickerel	14.4
Salmon/Trout	35.5
Perch/Panfish	7.0
Bullheads	3.3

Orleans County

The Orleans County Lake Ontario fishery is highly regional, drawing from the Buffalo ACI. Approximately 30,000 of a total of 32,600 angler days, and $97,000 of a total of $108,000 in local expenditures were from anglers residing within the Buffalo ACI. See Table 18 for other estimates.

Buffalo ACI anglers fishing in Orleans County had a moderately high average income level. Other characteristics (e.g., largely male, one-third of spouses who fish, high proportion of children who fish) were similar to those of anglers throughout the Great Lakes. More of these anglers (33%) were members of sports clubs, however, than other Great Lakes destination groups.

Salmon and trout were the preferred species of 36% of Buffalo ACI anglers fishing Orleans County. Notable proportions of anglers also listed bass, northern pike, and walleye as preferred species (Table 19).

Table 18 Effort and Expenditure Data for Lake Ontario, Orleans County Anglers by Residence Market Zones, 1976-77

	Angler Days		Expenditures	
Residence ACI	Total (000's)	Per Thousand Licenses Sold	Total (000's)	Per Thousand Licenses Sold
Syracuse	1.1	14	4	45
Rochester	1.5	27	7	113
Buffalo	30.0	289	97	939
New York Totals	32.6	55	108	182

* Available for New York data only.

Table 19 Profile of Lake Ontario Anglers, Orleans County by Major Residence Market Zones

Characteristics	Major Residence Market Zones
	Buffalo
% Male	90
% Spouse Fishes	32
% Children Fish	86
Age (Mean)	42
Years Fished (Mean)	31
Sports Club Member (%)	33
Education (Mean Years)	12.4
1976 Household Income (Mean, $000's)	16.9
Preferred Species to Fish For (%)	
Bass	19.5
Walleye	11.1
Musky/N. Pike/Pickerel	16.6
Salmon/Trout	36.2
Perch/Panfish	8.3
Bullheads	5.6

Niagara County

The Niagara County Lake Ontario fisheries drew anglers almost exclusively from the local Buffalo ACI. About 96% of angler days and 95% of destination expenditures occurred from Buffalo ACI anglers. Small numbers of anglers also came from the Rochester and Elmira ACIs (Table 20).

Buffalo ACI anglers fishing the Lake Ontario shoreline had the highest mean income of any primary ACI group west of Jefferson County; the $18,600 mean income level in 1976 would translate to about $29,400 in 1981 dollars. Although 61% of the households had children who fished (Table 21), this figure is the lowest of any primary ACI group fishing the Great Lakes. Other characteristics (high proportion of males, about one-third of spouses who fish, mean age of 39) were similar to findings elsewhere on the Great Lakes. Unlike Buffalo ACI anglers fishing neighboring Orleans County, only 15% of those fishing Niagara County belonged to sports clubs.

Preferred species of Niagara County anglers were split; 20% to 25% indicated a first preference to fish for walleye, bass, and salmon/trout. There was also notable interest in fishing for northern pike/muskellunge, and for perch/panfish (Table 21).

Table 20 Effort and Expenditure Data for Lake Ontario, Niagara County Anglers by Residence Market Zones, 1976-77

	Angler Days		Expenditures	
Residence ACI	Total (000's)	Per Thousand Licenses Sold	Total (000's)	Per Thousand Licenses Sold
Elmira	*	*	4	209
Rochester	*	*	4	63
Buffalo	45.0	433	136	1,310
New York Totals	46.9	81	143	242

* Too small to estimate.

Table 21 Profile of Lake Ontario Anglers, Niagara County by Major Residence Market Zones

Characteristics	Major Residence Market Zones
	Buffalo
% Male	87
% Spouse Fishes	32
% Children Fish	61
Age (Mean)	39
Years Fished (Mean)	26
Sports Club Member (%)	15
Education (Mean Years)	12.6
1976 Household Income (Mean, $000's)	18.6
Preferred Species to Fish For (%)	
Bass	22.6
Walleye	24.7
Musky/N. Pike/Pickerel	14.0
Salmon/Trout	20.6
Perch/Panfish	11.8
Bullheads	4.3

Lake Erie Anglers

Lake Erie anglers are largely from the local Buffalo ACI. About 98% of angler days spent at the Erie County portion, and 94% of those spent at the Chautauqua County portion of the lake originated within the Buffalo ACI. Similarly, 98% of expenditures at the fishing destination originated from anglers residing in the Buffalo ACI. Both the Erie and Chautauqua portions of the lake had small but notable out-of-state visitation and expenditures which exceeded that of any other residence market zone in New York. See Table 22 for effort and expenditure estimates.

Most characteristics of Lake Erie anglers are similar to those of Lake Ontario anglers. The vast majority of anglers were male, roughly one-third had spouses who fish, and the majority of households had children under 16 who fish. The educational level of these anglers was comparatively high, however; the 14.7 mean years of education for Buffalo ACI residents fishing Chautauqua County was the highest of any Great Lakes ACI group. Incomes did not parallel education, however, especially for anglers fishing the Chautauqua County portion of Lake Ontario. The $14,300 mean income in 1976 for these anglers was about $2,000 below the mean for Great Lakes anglers. Very few of these anglers belonged to sports clubs (Table 21).

Unlike Lake Ontario anglers, the largest proportion of Lake Erie anglers (roughly one-third) indicated their first preference was to fish for walleye; salmon and trout was second for the anglers fishing the Erie County portion of Lake Erie, while bass was second for the Chautauqua County portion. Considerable interest was shown in a wide range of species (Table 23).

Table 22 Effort and Expenditure Data for Lake Erie Anglers by Residence Market Zones, 1976-77

Residence ACI	Angler Days Total (000's)	Angler Days Per Thousand Licenses Sold	Expenditures Total (000's)	Expenditures Per Thousand Licenses Sold
		Erie County		
Utica	0.2	8	*	8
Rochester	2.5	43	5	78
Buffalo	511.1	4,924	1,673	16,118
New York Totals	513.8	868	1,678	2,835
Out of State	5.4	**	13	**
Totals	519.2	**	1,691	**
		Chautauqua County		
Rochester	1.6	29	1	14
Buffalo	87.9	847	159	1,534
New York Totals	89.5	151	160	270
Out of State	4.4	*	2	*
Totals	93.9	**	162	**

* Too small to estimate.
** Available for New York data only.

Table 23 Profile of Lake Erie Anglers by Major Residence Market Zones

Characteristics	Major Residence Market Zones	
	Buffalo (Erie County destination)	Buffalo (Chautauqua County destination)
% Male	88	87
% Spouse Fishes	32	40
% Children Fish	77	71
Age (Mean)	40	41
Years Fished (Mean)	32	26
Sports Club Member (%)	13	10
Education (Mean Years)	14.0	14.7
1976 Household Income (Mean, $000's)	16.3	14.3
Preferred Species to Fish For (%)		
Bass	16.8	21.1
Walleye	33.0	30.3
Musky/N. Pike/Pickerel	12.4	12.9
Salmon/Trout	21.9	15.6
Perch/Panfish	14.9	16.5
Bullheads	0	1.8

SUMMARY

New York's Great Lakes coastline relies heavily upon recreation and tourism as a part of the local economic base. For some sections of the coastline, this is traditional; for others it is newly developing. Successful development requires two major ingredients: facilities and resources attractive to tourists, and the communication to tourists that these facilities and resources are indeed available. Although recreational development is a long-term phenomenon spanning decades, all areas of the Great Lakes now have some attractions worthy of promoting. This study was designed to help Great Lakes communities understand the primary markets of one of their principal resource attractions, the Great Lakes sport fisheries.

As is true of all studies, the results of this study should be carefully interpreted. The data are four to five years old at the time of printing of this report. Findings of primary geographic markets shouldhold true for some period of years. However, major changes in fishing stocks, presence of contaminants, availability of new access points, opening of new highways, or fishing restrictions or costs could change the market structure of Great Lakes anglers.

A further precaution lies in the interpretation of the potential of market segments actively fishing the Great Lakes. While the study identifies those segments to whom the Great Lakes fisheries appealed most strongly in 1976-77, it provides no information about the degree of market saturation of those segments. It is a typical rule of thumb to aim promotional materials toward those segments which research shows to be currently most interested; that is in general a suggested use of this report. Marketing should typically be aimed at drawing more

anglers from leading market segments, and/or appealing to the current angler audiences to stay longer at the destination area. However, there may be situations in which little potential remains among an active market segment because the vast majority of those potentially interested are already participating. Further studies of market potential would be needed to determine this.

In the absence of these studies, given the large number of freshwater licenses sold in upstate New York, and given developing fisheries resources in the Great Lakes which are viewed as having high potential, it is the author's belief that the potential for attracting more anglers from active market segments to the Great Lakes-St. Lawrence River is generally very good. The information contained in this report should be useful in identifying which areas of the state (by ACI) particular Great Lakes destination counties should aim their marketing toward, and the characteristics of anglers most likely to be attracted.

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