ECONOMICS OF SPORT FISHING IN MANISTEE, BENZIE AND GRAND TRAVERSE COUNTIES

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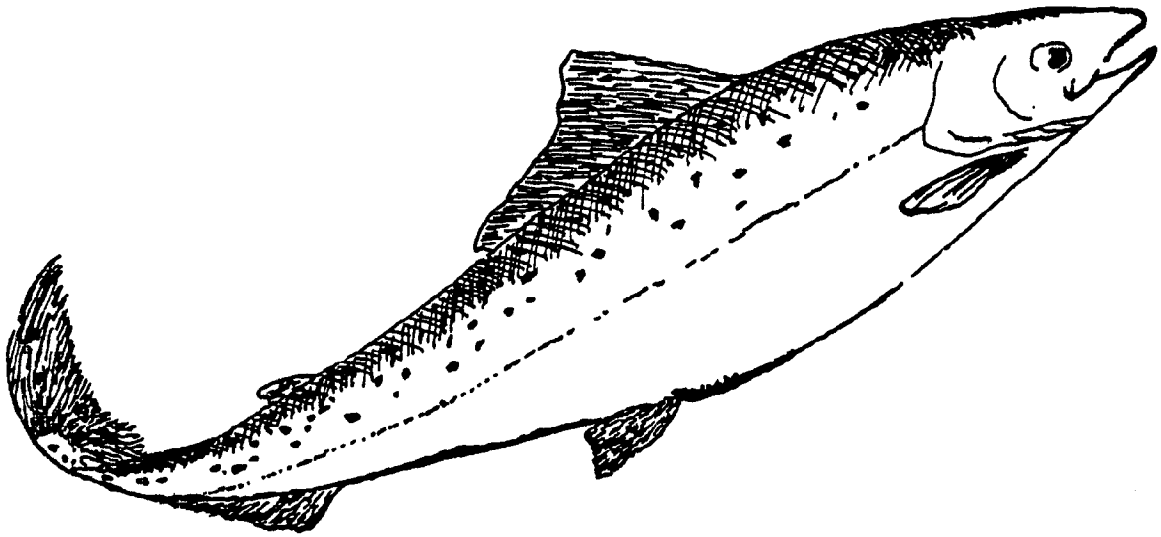

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ECONOMICS OF SPORT FISHING IN MANISTEE, BENZIE AND GRAND TRAVERSE COUNTIES

A Study of the Lake Michigan Fisheries
from October 1981 to October 1982

by

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October 1983

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SUMMARY

During the one year period from October 1982 through September 1983, we estimate anglers spent about $2.5 million in Manistee County, $1.9 million in Benzie County and $160,000 in Grand Traverse County for angling for Great Lakes fish. Of this, non-residents spent about $2.2 million in Manistee County, $1.7 million in Benzie County and $77,000 in Grand Traverse County, generating total sales of about $4.4 million in Manistee County, $3.5 million in Benzie County and $154,000 in Grand Traverse County, and increasing county personal incomes by about $1.5 million in Manistee County, $1.2 million in Benzie County and $54,000 in Grand Traverse County. The boat fisheries in all three counties were by far the most significant fisheries, contributing 78 percent of the economic impact in Manistee County, 75% in Benzie County and 83% in Grand Traverse County. See Tables 1, 2 and 3 for more detail.

This study estimated the angling effort, associated spending and related economic and marketing information for ice, pier, shore, boat and charter fishing in Manistee, Benzie and Grand Traverse counties, and foul-hook fishing in Manistee County. Each fishery differs from the others, not only in mode, location and season, but also in the type of individuals attracted and their needs and perceptions. By documenting who is attracted to each fishery, and their associated needs and perceptions, we hope to provide insights to public officials and businesses about how to attract more anglers and better meet their needs.

The anglers we encountered in the Grand Traverse fisheries were predominantly county residents. Manistee County and Benzie County however, drew a significant share of non-resident (out-of-county) anglers. Consequently, Grand Traverse's economic impact of the fishery is relatively low because so few anglers traveled far to fish there. In contrast the Manistee County and the Benzie County fisheries with their large percentages of non-residents show substantial economic impacts; from 10 to 15 times as great as those found in Grand Traverse County. From our interviews with anglers, we believe that the adverse impacts of Native Americam gill-netting in the Grand Traverse Bay region on fish stocks is what accounts for the reduced level of angling activity in Grand Traverse County. One local businessman's opinion was that before the gill-netting, angling use in Grand Traverse County was 10 times greater than current levels. We have

Table 1. Summary of angler use (angler days), expenditures and secondary economic impacts in Manistee County for all angling for Great Lakes fish and related angling in Manistee County in 1982-83.

	ALL ANGLERS		NON-RESIDENT	
Fishery	Use	$	Use	$
Manistee ice	5,862	33,296	821	4,934
Manistee pier	19,544	182,541	6,059	82,099
Manistee shore	24,289	201,113	12,333	164,399
Manistee boat	112,484	1,934,725	96,136	1,846,773
Manistee foul-hook	5,722	125,541	5,035	121,142
Manistee total	167,901	2,477,216	120,384	2,219,347

Secondary Economic Impacts on Manistee County of Non-resident Angler Expenditures

Angler Expenditures		Multiplier		Gross Revenues
$2,219,347	X	2.00	=	$4,438,694

Gross Revenues		Income Component		Personal Income
$4,438,694	X	0.35	=	$1,553,543

Table 2. Summary of angler use (angler days), expenditures and secondary economic impacts in Benzie County for all angling for Great Lakes fish and related angling in Benzie County in 1982-83.

	ALL ANGLERS		NON-RESIDENT	
Fishery	Use	$	Use	$
Benzie ice	5,970	26,092	1,115	4,973
Benzie pier	8,564	73,479	2,484	31,845
Benzie shore	32,031	373,481	21,461	315,262
Benzie boat	64,307	1,416,683	60,449	1,397,581

Table 2 continued:

Benzie total	110,872	1,889,735	85,509	1,749,661

Secondary Economic Impacts on Benzie County of Non-resident Angler Expenditures

Angler Expenditures		Multiplier		Gross Revenues
$1,749,661	X	2.00	=	$3,499,322

Gross Revenues		Income Component		Personal Income
$3,499,322	X	0.35	=	$1,224,763

Table 3. Summary of angler use (angler days), expenditures and secondary economic impacts in Grand Traverse County for all angling for Great Lakes fish and related angling in Grand Traverse County in 1982-83.

	ALL ANGLERS		NON-RESIDENT	
Fishery	Use	$	Use	$
Traverse ice	427	1,697	n.a.	n.a.
Traverse shore	4,403	25,097	1,249	9,805
Traverse boat	18,482	132,886	6,654	66,873
Traverse total	23,312	159,680	7,903	76,678

Secondary Economic Impacts on Grand Traverse County of Non-resident Angler Expenditures

Angler Expenditures		Multiplier		Gross Revenues
$76,678	X	2.00	=	$153,356

Gross Revenues		Income Component		Personal Income
$153,356	X	0.35	=	$53,675

no doubts that if commercial fishing had not taken place in Grand Traverse Bay, the economic impacts of sport fishing in Grand Traverse County would be similar to those we found in Manistee and Benzie Counties.

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INTRODUCTION

Even as Michigan's manufacturing-based economy is gradually beginning to recover from the current recession, the economic contribution made by recreation-tourism industries in Michigan during those economically bleak years reminds many communities of the significance of the recreationist's dollar . While recreation and tourism dollars will probably never replace all the manufacturing jobs and income lost throughout the state, the current economic problems have focused the attention of public officials and private citizens on the present and potential future contribution of Michigan's tourism resources.

Great Lakes sport fishing has for many years been one of Michigan's major recreational pursuits and tourist attractions. All coastal counties offer attractive fishing. Angler expenditures vary, but the economies of many coastal communities depend heavily on this spending. In a study of the economic impacts of Great Lakes sport fishing in Alcona County, Michigan (Jordan and Talhelm, 1982), we found that angler expenditures are a major component of the local economy. Great Lakes anglers spent over $1.3 million in 1981 in Alcona County, distributed over a wide spectrum of the local business community. Alcona County (population 10,000) is located on Lake Huron in the northeast corner of Michigan's Lower Peninsula. In that rural area the economic base was limited and fishing pressure was great. In the more populous and industrialized areas of Muskegon, Ottawa, Bay, and Macomb counties, we found that whereas the total dollar impacts were several times greater than they were in Alcona County, they comprised a smaller percentage of the much larger overall local economies.

The Alcona County study was initiated when local businesses became concerned that local residents and government officials incorrectly percieved that Great Lakes sport fishing was of no benefit to Alcona's economy. An important aspect of that study was that it surveyed anglers directly, giving added credibility to the estimates. We also investigated the interests and needs of anglers, businesses and residents. The communities were able to document and address those issues and problems which were of particular concern to each group. They knew how they could attract and better serve more anglers if they wished.

As the reports of the Alcona study spread throughout the state, other counties realized their need for similar information about their own Great Lakes fishing opportunities. When Muskegon and Ottawa counties expressed interest in having a study done, we saw it as an excellent opportunity to analyze an area of the state much different from Alcona County. In Muskegon County we found anglers spent 170,000 angler days and $1.8 million and in Ottawa County 240,000 angler days and $4.6 million.

The Muskegon County Commissioners were dismayed by the disparity of economic impacts between the two counties, yet our investigation revealed several factors which accounted for the differences. The most significant factor was that the Muskegon fisheries were characterized by a local clientele. Particularly in the city of Muskegon, fishing has never been promoted. They have always had a good fishery resource and even have additional ones developing (walleye in Muskegon lake), but because of their reliance on a heavy-manufacturing based economy have never adequately marketed their fishing resources. Plenty of their local people utilize the resource, and there certainly is a quality-of-life benefit associated with that aspect, but they have historically neglected the income-producing aspect of recreational fishing. However, with our results as an added impetus, they are now moving ahead with planning (new marinas and more promotion) to more effectively tap the fishery's revenue-generating potential.

Manistee, Benzie and Grand Traverse Counties were chosen as a study area because they encompassed a mix of the community types found in Northwest Lower Michigan. The three county region has a varied economy with many light to heavy manufacturing industries, a large farming community, and a well established tourism trade based on a variety of natural resources and cultural attractions. The character of the communities along the Lake Michigan shoreline ranges from the "rural" type represented by places such as Wellston and Arcadia, through the "small town" type such as Onekama, Frankfort and Beulah, to the relatively "modern urban" type represented by Manistee and Traverse City. In addition to the spectrum of communities the area offered, we were interested in Grand Traverse County in particular, because an economic impact analysis was done there ten years ago (Kapetsky and Ryckman, 1973). That study provides an excellent benchmark to our work in seeing how impacts in Grand Traverse County have changed over time with changes in the fisheries.

The Great Lakes fishing opportunities available in the three county area are varied. A winter ice fishery offers a variety of gamefish (northern pike *Esox lucius*, yellow perch *Perca flavescens*, crappie *Pomoxis* spp., and bluegill *Lepomis macrochirus*), smelt *Osmerus mordax*, whitefish *Coregonus clupeaformes*, steelhead trout *Salmo gairdneri*, brown trout *Salmo trutta*, chinook salmon *Oncharycus tshawytscha* and coho salmon *Oncharycus kisutch*) on one or more of the following lakes: Manistee Lake, Portage Lake, Arcadia Lake, Upper and Lower Herring Lakes, Betzie Lake, Crystal Lake, Platte Lake, Little Platte Lake, Boardman Lake and the East and West arms of Grand Traverse Bay. Those same lakes also offer fishing opportunities during the spring, summer and fall for those same species in addition to largemouth bass *Micropterus salmoides*, smallmouth bass *Micropterus dolomieui*, and catfish *Ictalurus* spp. on some of them.

On the Lake Michigan waters of the three counties anglers fish for salmon Oncorhynchus spp., lake trout Salvelinus namaycush, steelhead Salmo gairdneri, brown trout Salmo trutta, menominee Prosopium cylindraceum, whitefish and yellow perch from boats, piers, and the shore.

The primary goals of this investigation were to estimate: 1) the total number of angler days - an angler day is one person fishing any part of one day - spent fishing by anglers in all the Great Lakes-associated fisheries in the three county area, 2) the average daily expenditures by both county resident and county non-resident anglers for each of the different fisheries previously listed and 3) angler perceptions of the adequacy of both public and privately offered goods and services in the study area, along with their overall impressions of the fishing opportunities available in the three counties.

A one year study always presents the risk of sampling a time period which does not represent the norm. From conversations with local people and from actual experience through the interviewing process, it appears that the year in which this study was made approximated the normal in all respects but one; the relatively warm winter drastically cut the level of use associated with the area's ice fisheries. The extreme was Grand Traverse Bay, where there was no ice fishery during our study period.

We have found in past studies that non-resident anglers have greater average daily expenditures than county resident anglers. Manistee and Benzie Counties showed the greater economic impacts because of their historically good salmonid fisheries, which are patronized by many non-residents. Grand Traverse County on the other hand had minimal economic impacts (except for the fall salmon fishery on the Boardman River) due to the predominantly local clientele associated with its fisheries. This is in contrast to the situation which existed ten years ago when sport fishing use in Grand Traverse County was on a par with Manistee and Benzie Counties (Kapetsky and Ryckman, 1973). At that time non-resident angler expenditures were approaching $500,000. We believe had gill-netting not been allowed in Grand Traverse Bay, Grand Traverse County would be experiencing economic impacts attributable to sport fishing on the order of those we currently found in Manistee and Benzie Counties.

For the entire study year, we estimated that anglers spent about 170,000 days fishing and $2.5 million in Manistee County, 111,000 days and $1.9 million in Benzie County and 23,000 days and $160,00 in Grand Traverse County. Of those totals, non-residents spent 120,000 angler days and $2.2 million in Manistee County, 85,000 days and $1.7 million in Benzie County and 8,000 days and $77,000 in Grand Traverse County. Those estimates are apportioned by fishery in the different sections of this report.

Anglers expressed a number of opinions and perceptions when interviewers asked if the businesses and government agencies in the area provided adequate services and facilities for their

angling needs. However, interviewers were very careful not to lead anglers into any particular response. Therefore, while in any particular section of this report it may not seem many anglers expressed concerns or perceptions, those views expressed were of paramount concern to the anglers interviewed.

SURVEYS

Anglers were interviewed at all Great Lakes fishing access points within the three county area. We found access points by either: 1) observing anglers or 2) asking local people to point out fishing areas.

In Manistee County we sampled fishing activity on: (1) Manistee Lake, Portage Lake and Arcadia Lake, (2) the Lake Michigan piers associated with each of those lakes, (3) Lake Michigan (offshore salmonid) originating from each of those lakes and (4) the Little Manistee and Big Manistee Rivers (anadromous fish). We also made a separate survey of the legal foul-hook fishery below Tippy Dam on the Big Manistee River. In Benzie County we sampled fishing on: (1) Upper and Lower Herring Lakes, Betzie Lake, Crystal Lake, Platte Lake and Little Platte Lake, (2) the Lake Michigan piers in Frankfort-Elberta, (3) Lake Michigan (offshore salmonid) originating from Betzie Lake and Platte Bay and (4) the Betzie River, Platte River and Otter Creek (anadromous fish). In Grand Traverse County we sampled fishing on: (1) Boardman Lake, (2) the Boardman River (anadromous fish), (3) the beaches and breakwalls around Grand Traverse Bay and (4) the East and West arms of Grand Traverse Bay (offshore salmonid) originating from various points around the Bay.

Anglers were questioned about their trip expenditures, their length of stay, their fishing success, where they were from, where they were staying, their impressions of the fishing in that sample area, whether they had reasons other than fishing for their trip, their perceptions of government and local businesses and personal information. A copy of the angler questionnaire can be found in Appendix A.

Ice, pier, shore and foul-hook fishing

Ice, pier, shore and foul-hook fishing use was estimated using a roving survey (Hayne, 1966 and 1972; Malvestuto, Davies and Shelton, 1978; and Talhelm, 1972). A roving survey consists of systematic traverses of either sections of shoreline, a pier, or a concentration of ice anglers. In all three instances, anglers are asked how long they plan to fish that day to determine their probability of being encountered by an interviewer. The probability depends on the anglers' length of stay and the number of traverses that day of the fishing site by the interviewer. We

estimated the total number of anglers fishing at a site on a sample day by summing the inverse probability for each angler interviewed. We then averaged daily estimates for each site for each season, distinquishing between weekday and weekend/holiday usage, to estimate total use for each identified fishery.

Foul-hook, shore, pier, and ice anglers were usually interviewed before they had finished fishing for the day. Each anglers' total daily catch was projected by multiplying the ratio of the number of hours they planned on fishing that day to the number of hours they had already fished when interviewed, times the number of fish they had caught at the time of the interview.

Boat fishing

Boat use was estimated at each launching site within the three county study area by first estimating daily fishing boat launchings and multiplying the average daily launchings by the average fishing boat party size. Interviewers estimated boat launchings by first counting the number of empty trailers at the particular launch site and adding to it the number of additional boats launched while they were at the site. Interviewers usually arrived at a launch site in mid-morning and stayed until most boats had returned. As boats returned to the launch site, the interviewer not only interviewed the anglers on those boats which were out fishing, but he/she also kept a tally of how many of the returning boats were either fishing or non-fishing boats. This gave us an estimate of the proportion of that days total launchings which we could attribute to angling use. The average of these daily totals of fishing boats at any given launch site was then multiplied by the average number of anglers per boat at that site (we determined this from our actual interviews of anglers) to estimate the average daily boat angler use for that site. The average daily use was then expanded by the number of days in the boating season at that launch site.

WINTER ICE FISHING

The 1982-83 winter season was one of the warmest on record in Michigan. Both the East and West arms of Grand Traverse Bay never froze that winter and Boardman Lake in Grand Traverse County, the Platte Lakes in Benzie County, and Arcadia, Portage and Manistee Lakes in Manistee County had safe ice for about 50 days. Consequently, the short ice fishing season in the study area will mean our estimates of ice fishing economic impacts are probably an underestimate of the average over time.

In Manistee County we interviewed ice anglers on Arcadia Lake, Portage Lake and Manistee Lake, as they are all connecting lakes to Lake Michigan. In Benzie County we interviewed ice anglers on Little Platte Lake, Platte Lake, Crystal Lake, Betzie Lake and Upper and Lower Herring Lakes. While only Betzie Lake and Lower Herring Lake connect directly with Lake Michigan, we included the other four lakes because they are in close to proximity to Lake Michigan and are in an area frequented by Great Lakes anglers. Our sampling in Grand Traverse County was confined solely to Boardman Lake.

Two types of ice angler use were sampled differently. Anglers fishing in the open were counted, and their associated use estimated using the roving survey-probability methods described in the Surveys section.

Shanty fishing effort was estimated using a three-step method. First, shanties were counted on each sampling day at each site. These counts were used to calculate the average daily number of shanties for the season at each site. Second, from shanty angler interviews, we calculated the average number of anglers per occupied shanty at each site. Third, interviewed shanty anglers were asked how many times during the ice fishing season they expected to use their shanty. Since shanty anglers who fished more often were more likely to be interviewed, we weighted: 1) the number of anglers per shanty and 2) the number of days the angler expected to use the shanty during the ice season, by the probability of encountering that angler.

For instance, if an angler told us he was going to fish 10 times that season, and the season was 80 days long, then we weighted his response by a factor of eight. By multiplying the average daily number of shanties by the weighted average of number of anglers in a shanty, and then again by the weighted average of number of times anglers expected to use their shanties, we estimated total shanty angler use at each ice fishing site.

Ice anglers spent a total of 5,862 days and $33,296 in Manistee County, 5,970 days and $26,092 in Benzie County and 427

days and $1,697 in Grand Traverse County. Of those totals non-residents spent 821 angler days and $4,934 in Manistee County and 1,115 days and $4,973 in Benzie County.

Tables 4, 6 and 8 list the average daily expenditures made by ice anglers in the three counties for a number of categories of purchases. The averages listed are for the entire population of anglers (resident and non-resident), whereas the figures in parentheses are the average non-resident expenditures. The local nature of the ice fisheries explains the very low expenditure patterns. Tables 5, 7 and 9 list anglers' comments about their perceptions of the adequacy of both private and public facilities and services in the three counties.

Manistee County

Portage Lake had the most ice fishing activity, 3,674 angler days. Much of that use was from people coming from Manistee, which is only 12 miles away. Manistee Lake had spotty activity, 1,761 angler days, because the condition of the ice was unstable due to the Big and Little Manistee Rivers bringing relatively warm water into the lake all winter. Arcadia Lake had the least use, 427 angler days, simply because of its rural location.

Ice fishing occured in two locations on Manistee Lake. The first was in the area of the marinas along Arthur Street and the second was in the southern portion of the lake near Stronach. Ice anglers in both locations were primarily jigging for steelhead and coho salmon, although some were fishing for pike and panfish. Again the level of activity was contingent upon the condition of the ice in both locations, the presence and integrity of which fluctuated considerably from the influence of the Big and Little Manistee Rivers.

Ice anglers on Portage Lake were found fishing on the northeast side of the lake off Onekama, the southest corner where Highway 22 parallels the lake, on the south side along Crescent Beach Rd. and on the north side of the lake off Portage Point Drive. Ice anglers on Portage Lake primarily caught yellow perch, bluegill and pike. Shanty anglers represented a significant proportion of the ice angling effort, their being as many as 75 shanties present during the first part of February 1983. On Arcadia Lake all of the activity was in the vicinity of the Arcadia marina. As many as 15 shanties were observed there during the season, and anglers were primarily catching yellow perch.

Seventy-two percent of all Manistee County ice anglers interviewed had caught fish on the day questioned. The average aggregate catch for all Manistee County ice anglers was 8.2 fish per angler day, 73% of which were yellow perch. Non-residents comprised 14% of all the anglers we interviewed. Most of the non-residents were on one day trips which explains why their

average expenditures were similar to the average for all ice anglers.

Table 4. Ice anglers' average daily expenditures made in Manistee County.

Type of expenditure	Manistee County
Major fishing equip.	.24
Tackle-small gear	1.52 (1.83)
Lodging	.12 (.84)
Restaurants	.16 (1.33)
Groceries	.82 (.24)
Beer	.67 (.37)
Vehicle gas	1.74 (.58)
Miscellaneous	.41 (.82)
Total	5.68
Non-resident total	(6.01)

The total estimated gross expenditures in Manistee County of all ice anglers were:

5,862 angler days X $5.68 per angler day = $33,296

The estimated gross expenditures in Manistee County of all non-resident ice anglers were:

821 angler days X $6.01 per angler day = $4,934

All the anglers interviewed felt the local businesses provided adequate services and facilities. Sixty-two percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 5. Manistee ice angler comments.

I. Responses about government agencies.

Responses	% of interviewed anglers
1. Plow accesses more frequently.	4.2%
2. Have a larger limit on panfish.	2.3%
3. Clean up Manistee River and Manistee Lake.	2.3%
4. Keep the boat ramps open in winter.	1.8%
5. Stock more steelhead.	1.8%
6. Stop the gillnetting.	1.8%
7. Keep the restrooms open.	1.3%
8. Heat the restrooms.	0.8%
9. Stop charging to launch boats.	0.8%

III. General responses.

Response	% of interviewed anglers
1. The fishing is good in this area.	12.4%
2. Like the shopping and restaurants close by.	3.8%
3. Friendly people in the area.	2.8%
4. Equipment is reasonably priced.	1.8%
5. Do not like the factories along Manistee Lake.	1.3%
6. Beautiful area.	1.3%

Benzie County

Crystal Lake had the most ice fishing activity, 4,287 angler days. An ice fishing tournament in February sponsored by some Beulah tackle stores was instrumental in generating some of that use. Platte Lake had 822 angler days of use and Little Platte Lake had 345 angler days. The use on Platte and Little Platte Lakes was almost entirely from residents within the immediate vicinity of those lakes. Likewise, Upper and Lower Herring Lakes had only 397 angler days of use and Betzie Lake had 119 angler days, predominantly from residents within those areas.

There were a number of areas on Crystal Lake where ice anglers fished. Ice anglers were interviewed near Beulah, off

Railroad Point, Slades, the Boat House, Mitchell Bay, the Girls Camp, Chimney Corners and Danger Hill. Anglers in all locations were mostly catching yellow perch, smelt and whitefish, with an occasional lake trout caught. On the Platte Lakes anglers mostly caught yellow perch, panfish and pike with the primary areas of activity being the west shore of Little Platte Lake and the north shore and Platte River entrance on Platte Lake. Ice anglers on Betzie Lake were most often jigging for trout, with use there sporadic because of the Betzie River's influence on the ice. Lower Herring Lake provided mostly yellow perch fishing from fish coming in off Lake Michigan, while many of the anglers on Upper Herring Lake fished for pike and panfish.

Fifty-seven percent of all Benzie County ice anglers interviewed had caught fish on the day questioned. The average aggregate catch for all Benzie County ice anglers was 4.3 fish per angler day, 52% of which were yellow perch. Non-residents comprised 17% of our sample. All non-residents were on one day trips which explains why their overall expenditures were similar to the average for all ice anglers.

Table 6. Ice anglers' average daily expenditures made in Benzie County.

Type of expenditure	Benzie County
Major fishing equip.	.37 (.53)
Tackle-small gear	1.27 (1.74)
Restaurants	.11 (.23)
Groceries	.97 (.52)
Beer	.34 (.25)
Vehicle gas	1.12 (.78)
Miscellaneous	.18 (.41)
Total	4.36
Non-resident total	(4.46)

The total estimated gross expenditures in Benzie County of all ice anglers were:

5,970 angler days X $4.36 per angler day = $26,029

The estimated gross expenditures in Benzie County of all non-resident ice anglers were:

1,115 angler days X $4.46 per angler day = $4,973

Ninety-five percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Fifty-three percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 7. Benzie ice angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Tackle and bait stores need to open earlier.	3.4%
2. Tackle and bait store prices are too high.	2.8%
3. Gas prices are too high.	2.8%
4. Restaurants need to open earlier.	2.2%
5. Restaurants need to stay open later.	1.6%
6. Small stores (markets) should sell hot coffee.	1.0%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the gillnetting.	4.6%
2. Need to manage Platte Lakes for more pike.	2.8%
3. Plow accesses to small lakes in area.	2.2%
4. DNR should not allow pike spearing.	2.2%
5. DNR should allow a person to fish three tip-ups.	2.2%
6. Enforce egg-selling laws.	1.6%
7. DNR sells too many fish.	1.6%
8. DNR should stop planting coho in the Platte River.	1.6%
9. DNR should let more fish through the lower Platte River weir.	1.6%

Table 7 continued:

10. Stock sturgeon in Platte Lake.	0.8%
11. DNR should do something to stop all the snagging on the Platte and Betzie Rivers.	0.8%

III. General responses.

Response	% of interviewed anglers
1. The fishing here is great.	8.4%
2. Loves the Benzie County area.	6.6%
3. Wish the illegal snagging could be stopped.	3.0%
4. Do not like to see fish taken just for their eggs.	2.6%
5. The pike population in Platte Lake is down.	1.8%
6. Likes the solitude; not crowded.	1.8%
7. The fishing is poor.	1.2%

Grand Traverse County

Boardman Lake was the only location in Grand Traverse County where ice fishing interviews were made. This was because it was the only lake close enough to Grand Traverse Bay in the county to be considered a substitute. We had every intention of interviewing anglers on Grand Traverse Bay as there is usually considerable use in the winter (Traverse City holds a Frozen Cherry Festival with ice fishing as one of the main attractions), but there was never a time or place on the Bay when ice formed that winter. Ice anglers on Boardman Lake primarily caught yellow perch, crappie, bluegill and northern pike.

Forty-nine percent of all Boardman Lake ice anglers interviewed had caught fish on the day questioned. The average aggregate catch was 2.4 fish per angler day. All interviewed anglers were on a one day trip and all anglers were local residents.

Table 8. Ice anglers' average daily expenditures made in Grand Traverse County.

Type of expenditure	Grand Traverse County
Tackle-small gear	1.02
Groceries	.54
Beer	.21
Vehicle gas	1.27
Miscellaneous	.18
Total	3.22

The total estimated gross expenditures in Grand Traverse County of all ice anglers were:

427 angler days X $3.22 per angler day = $1,697

All the anglers interviewed felt the local businesses provided adequate services and facilities. Eighty-six percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 9. Grand Traverse ice angler comments.

I. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the gillnetting.	11.0%
2. Plant more trout.	9.0%

III. General responses.

Response	% of interviewed anglers
1. The fishing is slow.	5.0%

PIER FISHING

Both Manistee and Benzie Counties have pier fishing available. The piers are actually breakwalls built by the United States Army Corps of Engineers to maintain channels for ocean-going ships to enter the ports of Manistee and Frankfort-Elberta. There are also piers on Portage Lake and Arcadia Lake, although ships do not enter either lake. Traverse City does have some breakwalls along its waterfront, but we considered them as providing more of a shore fishing opportunity, whereas the piers in Manistee, Portage Lake, Arcadia Lake and Frankfort-Elberta give anglers access to deeper water. Anglers fish from the piers from early spring until early winter.

Anglers fish for a variety of species of fish from the piers, the predominant one varying with the season. The general pattern, with some local exceptions, is for anglers to begin by fishing for steelhead, lake trout and brown trout in early spring. In late spring and for most of the summer, anglers fish primarily for yellow perch. Anglers fish for salmon in late summer and into the fall, and then for the steelhead and brown trout which follow the salmon on their migration up the rivers. Anglers also fish for menominee from the piers in the late summer and through the fall. We estimated the length of the pier season in Manistee and Benzie Counties to be 244 days (April 1 - November 30).

In the city of Manistee the piers account for a significant economic impact because of the proportion of non-residents who utilize them. We estimated that 37% of angler use on the Manistee piers was by non-residents. Likewise, for the Frankfort-Elberta piers non-residents accounted for 29% of the estimated use. For the Portage Lake and Arcadia Lake piers the associated impacts were much less because mostly local residents fish from those piers. Non-residents accounted for 16% of the use on the Portage Lake piers and 8% of the use on the Arcadia Lake pier. The impacts were also less for the Portage Lake and Arcadia piers beacause the non-residents using those piers where predominantly from adjacent counties, whereas the non-residents on the Manistee and Frankfort-Elberta piers had come from more distant origins and were staying in the area longer.

Tables 10 and 12 list the average daily expenditures made by pier anglers in Manistee and Benzie Counties. Totals of 19,544 angler days and $182,541 were spent in Manistee County and 8,564 angler days and $73,479 were spent in Benzie County for pier angling. Of those totals non-residents spent 6,059 angler days and $82,099 in Manistee County and 2,484 angler days and $31,845 in Benzie County. Tables 11 and 13 list anglers' comments about their perceptions of the adequacy of both private and public facilities in Manistee and Benzie counties.

Manistee County

Pier interviews in the city of Manistee were done on the north pier, the south pier and the two stub piers. On Portage Lake and Arcadia Lake interviews were done on the north piers. The average aggregate (all species) catch rate (fish per day) for all anglers on the Manistee piers was 0.52 fish, 0.37 fish on the Portage Lake pier, and 0.12 fish on the Arcadia pier. From our conversations with anglers, the study period was fairly typical in terms of angler success.

Table 10. Pier anglers' average daily expenditures made in Manistee County.

Type of expenditure	Manistee County
Major fishing equip.	.97 (1.27)
Tackle-small gear	1.72 (2.03)
Licenses	.48 (.62)
Launch fees	.06 (.18)
Boat gas	.09 (.21)
Camping	.24 (.85)
Lodging	.37 (.64)
Restaurants	.92 (1.42)
Groceries	1.19 (1.52)
Beer	.46 (.41)
Vehicle gas	1.94 (2.74)
Miscellaneous	.38 (.81)
Family spending	.52 (.85)
Total	9.34
Non-resident total	(13.55)

The total estimated gross expenditures in Manistee County of all pier anglers were:

19,544 angler days X $9.34 per angler day = $182,541

The estimated gross expenditures in Manistee County of all non-resident pier anglers were:

6,059 angler days X $13.55 per angler day = $82,099

Eighty-eight percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Fifty-seven percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 11. Manistee pier angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Prices in the area are too high.	7.4%
2. Bait stores need longer hours.	3.5%
3. Tackle stores have a limited selection of merchandise.	2.8%
4. Need a bait store closer to the pier.	1.4%
5. Area needs better restaurants.	1.1%
6. Need more fishing contests.	0.7%
7. Need a concession stand near the Manistee piers in the fall.	0.3%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Plant more salmon and steelhead.	11.2%
2. Stop the Indian gillnetting.	8.4%
3. DNR has too much authority.	3.1%
4. Need stricter laws and more enforcement.	2.4%
5. Manistee Lake still has pollution problems to clean up.	1.4%
6. Need discount license for senior citizens.	1.4%
7. Stop planting salmon.	1.1%
8. Need a larger limit on panfish.	1.1%
9. Develop more sites for pole fishing.	0.7%

Table 11 continued:

10. Arcadia pier needs work done on it.	0.3%
11. Need a cheaper license for people under 21.	0.3%
12. Should be allowed to catch fish anywhere, anytime.	0.3%

III. General responses.

Response	% of interviewed anglers
1. The fishing is great.	11.2%
2. Fishing is slow.	7.3%
3. Too crowded.	3.1%
4. The lakes and rivers are clean here.	2.1%
5. Likes eating the fish from here.	1.7%
6. Do not like all the out-staters coming here.	1.3%
7. Plenty of parking at Manistee piers.	1.3%
8. Like the businesses in downtown Manistee.	0.7%

Benzie County

Pier interviews in the Frankfort-Elberta area were done both on the north or Frankfort pier and the south or Elberta pier. The average aggregate catch rate (fish per day) for all anglers on the two piers was 0.32 fish. From our conversations with anglers, the study period was fairly typical in terms of angler success.

Table 12. Pier anglers' average daily expenditures made in Benzie County.

Type of expenditure	Benzie County
Major fishing equip.	.67 (.97)
Tackle-small gear	1.42 (1.82)
Licenses	.27 (.45)
Launch fees	.11 (.18)

Table 12 continued:

Type of expenditure	Benzie County
Boat gas	.17 (.29)
Camping	.28 (.54)
Lodging	.44 (.79)
Restaurants	.63 (1.07)
Groceries	1.46 (1.72)
Beer	.31 (.51)
Vehicle gas	2.07 (2.93)
Miscellaneous	.41 (.78)
Family	.34 (.77)
Total	8.58
Non-resident total	(12.82)

The total estimated gross expenditures in Benzie County of all pier anglers were:

8,564 angler days X $8.58 per angler day = $73,479

The estimated gross expenditures in Benzie County of all non-resident pier anglers were:

2,484 angler days X $12.82 per angler day = $31,845

Eighty-six percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Seventy-one percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 13. Benzie pier angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Prices in the area are too high.	9.3%
2. Restaurants need to have longer hours; open earlier, close later.	5.7%
3. Stores in town need longer hours.	4.5%
4. Tackle stores do not have a very good selection of gear.	2.1%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the gillnetting.	8.4%
2. Plant more salmon.	6.3%
3. Plant more steelhead.	4.8%
4. License fees are too high.	3.6%
5. Need more DNR people in the field and less in Lansing.	2.1%
6. Restore the railroad system and the ferries.	1.5%
7. Build a walkway from Elberta beach to the pier.	0.9%
8. Need a place to sit on the pier.	0.3%

III. General responses.

Response	% of interviewed anglers
1. The fishing is poor.	5.4%
2. The fishing is great.	4.8%
3. Likes the area.	3.3%
4. People here are friendly.	2.1%
5. Boaters come too close to the pier.	1.2%
6. Too many down-staters buying land.	0.9%
7. Turn off the fog horn.	0.3%

SHORE FISHING

We interviewed anglers wherever we found them fishing the shores of Lake Michigan, the shores of the connecting lakes or the shores of tributaries to Lake Michigan which had runs of anadromous fish. Anglers fish for a variety of species of fish from the various shore areas, the predominant one varying with the season and location. Along the Lake Michigan beaches, and especially in the vicinity of the piers, anglers fish in the spring primarily for brown trout and steelhead and again in the fall for steelhead, coho salmon and chinook salmon. From the shores of the connecting lakes anglers fish from spring through fall for yellow perch, panfish, largemouth and smallmouth bass, northern pike, catfish and suckers. Shore anglers fish the anadromous streams from fall through spring for salmon and steelhead.

Some of the shore fishing sites account for a significant economic impact because of the proportion of non-residents using them. For example, we estimated that non-resident use on both the Little Manistee and Big Manistee Rivers in Manistee County was between 40-50% of the total and that both the Betzie and Platte Rivers in Benzie County had non-resident use approaching 70% of the total. Other areas in both those counties and in Grand Traverse County were characterized more by a local contingent of anglers. For example, non-residents accounted for 6% of the use on Arcadia Lake in Manistee County and 5% of the use at Clinch Park in Traverse City.

Tables 14, 16 and 18 list the average daily expenditures made by shore anglers in the three counties. Totals of 24,289 angler days and $201,113 were spent in Manistee County, 32,031 angler days and $373,481 in Benzie County and 4,403 angler days and $25,097 in Grand Traverse County for shore fishing. Of those totals non-residents spent 12,333 angler days and $164,399 in Manistee County, 21,461 angler days and $315,262 in Benzie County and 1,249 angler days and $9,805 in Grand Traverse County. Tables 15, 17 and 19 list anglers' comments about their perceptions of the adequacy of both private and public facilities in the three counties.

Manistee County

In Manistee County we did interviews along the beaches near the Manistee piers, along the banks of the Manistee River where it flows from Manistee Lake to Lake Michigan, along the shore of Manistee Lake near Stronach where the Little Manistee River enters, along the banks of the lower Little Manistee River, along

the banks of the Big Manistee River from the confluence of Bear Creek upstream to the foul-hooking area below Tippy Dam, along the shore near Coho Bend on the Big Manistee River, on the beaches near the mouth of Portage Lake and near the Highway 22 bridge on Arcadia Lake.

The average aggregate (all species) catch rate (fish per day) for all anglers on the Manistee County Lake Michigan beaches was 0.08 fish, 0.87 fish on Manistee Lake, 1.45 fish on the Little Manistee River, 1.67 fish on the Big Manistee River, 2.56 fish on Portage Lake and 0.43 fish on Arcadia Lake. Non-residents accounted for 47% of the use on the Little Manistee River, 42% of the use on the Big Manistee River, 21% of the use on the Manistee beaches, 11% of the use on Manistee Lake, 8% of the use on Portage Lake and 6% of the use on Arcadia Lake.

Table 14. Shore anglers' average daily expenditures made in Manistee County.

Type of expenditure	Manistee County
Major fishing equip.	.96 (1.43)
Tackle-small gear	1.37 (1.94)
Licenses	.14 (.47)
Launch fees	.05 (.12)
Boat gas	.08 (.12)
Camping	.27 (.63)
Lodging	.52 (1.14)
Restaurants	.76 (1.28)
Groceries	1.25 (1.63)
Beer	.47 (.75)
Vehicle gas	1.85 (2.61)
Miscellaneous	.43 (.77)

Table 14 continued:

Type of expenditure	Manistee County
Family	.13 (.44)
Total	8.28
Non-resident total	(13.33)

The total estimated gross expenditures in Manistee County of all shore anglers were:

24,289 angler days X $8.28 per angler day = $201,113

The estimated gross expenditures in Manistee County of all non-resident shore anglers were:

12,333 angler days X $13.33 per angler day = $164,399

Ninety-three percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Fifty-one percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 15. Manistee shore angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Area stores need to open earlier and close later.	3.6%
2. Need bait shops closer to fishing sites.	3.2%
3. Prices are too high.	2.9%
4. Need a better selection in tackle stores.	1.8%
5. Need better restaurants.	0.7%
6. Need more fast food restaurants.	0.2%

Table 15 continued:

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Plant more steelhead.	27.4%
2. Plant more salmon.	17.6%
3. Release water later in day at Tippy Dam.	8.4%
4. Clean the restrooms.	5.6%
5. Legalize snagging everywhere.	3.9%
6. License fees are too high.	3.9%
7. Stop planting coho.	2.7%
8. Remove the Little Manistee River weir.	1.6%
9. Empty trash cans more often.	1.6%
10. Increase Conservation Officer patrols.	1.5%
11. Post signs where it is unsafe to fish.	0.9%
12. Ban all snagging.	0.8%
13. Do more to prevent pollution.	0.3%
14. Enforce a speed limit for boats on the Big Manistee River.	0.1%

III. General responses.

Response	% of interviewed anglers
1. Fishing is great.	14.7%
2. Fishing is slow.	8.3%
3. Beautiful area.	5.4%
4. Water is clean.	2.6%
5. Friendly people in area.	2.4%
6. Too crowded on river.	1.2%
7. Too many out-of-staters.	0.7%
8. Too many snags in river.	0.4%
9. Prices are fair in area.	0.2%
10. Tackle stores are well stocked.	0.1%
11. Too much line in Big Manistee River.	0.1%
12. Need a booklet showing best fishing spots.	0.1%

Benzie County

In Benzie County we interviewed along the shores of Upper and Lower Herring Lakes, along the Betzie River from the Highway 22 bridge upstream to the Thompsonville Dam, along the Platte River from its mouth upstream to the Platte River Hatchery weir, along the beaches at the mouth of the Platte River and at the mouth of Otter Creek. The average aggregate (all species) catch rate (fish per day) for all anglers on Upper and Lower Herring Lakes was 2.37 fish, 0.74 fish on Betzie River, 0.62 fish on the Platte River, 0.44 fish on the Platte Bay beaches and 0.23 fish on Otter Creek. Non-residents accounted for 3% of the use on the Herring Lakes, 66% of the use on the Betzie River, 69% of the use on the Platte River, 74% of the use on Platte Bay beaches and 7% of the use at the mouth of Otter Creek.

Table 16. Shore anglers' average daily expenditures made in Benzie County.

Type of expenditure	Benzie County
Major fishing equip.	1.27 (1.52)
Tackle-small gear	1.76 (2.07)
Licenses	.29 (.46)
Launch fees	.11 (.19)
Camping	.72 (.93)
Lodging	.93 (1.24)
Restaurants	.89 (1.17)
Groceries	1.52 (1.84)
Beer	.51 (.75)
Vehicle gas	2.35 (2.93)
Miscellaneous	.66 (.81)

Table 16 continued:

Type of expenditure	Benzie County
Family	.49 (.57)
Total	11.66
Non-resident total	(14.69)

The total estimated gross expenditures in Benzie County of all shore anglers were:

32,031 angler days X $11.66 per angler day = $373,481

The estimated gross expenditures in Benzie County of all non-resident shore anglers were:

21,461 angler days X $14.69 per angler day = $315,262

Ninety percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Fifty-eight percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 17. Benzie shore angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Prices in area are too high.	5.7%
2. Stores need to open earlier and close later.	4.5%
3. Area tackle stores have a poor selection of merchandise.	2.4%
4. Area stores raise prices during fishing season.	1.1%
5. Need better restaurants in Platte River area.	0.2%
6. Private camps are too high priced.	0.1%
7. Had rude service at Benzonia tackle store.	0.1%

Table 17 continued:

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the gillnetting.	12.4%
2. Need more fish cleaning facilities on the Platte and Betzie Rivers.	6.3%
3. Plant more salmon.	5.9%
4. Stop people from taking fish just for spawn.	4.3%
5. Let more fish up the Platte R.	2.9%
6. Plant more steelhead.	2.2%
7. Allow snagging everywhere.	1.3%
8. Post rules and regulations at all access points.	0.9%
9. Ban snagging.	0.5%
10. Take out the lower Platte River weir.	0.3%
11. Keep the restrooms clean.	0.3%
12. Permit fishing from Lake Michigan to Platte River weir.	0.2%
13. DNR sells too many fish.	0.2%
14. Stop planting coho in the Platte River.	0.2%
15. Need more access to Platte and Betzie Rivers.	0.2%
16. Need more Conservation Officers.	0.1%
17. Plant more brown trout.	0.1%
18. Increase the catch limits.	0.1%
19. Need a restroom on Platte Bay beach.	0.1%
20. Remove the swans from the Platte River (They eat the weedbeds).	0.1%
21. Plant more brook trout.	0.1%
22. Was unnecessarily hassled by a Federal Park ranger.	0.1%
23. Plant walleye in Platte Lake.	
24. Need campsites for canoe groups on the Betzie River.	0.1% 0.1%

Table 17 continued:

III. General responses.

Response	% of interviewed anglers
1. Great fishing.	14.5%
2. Area people are not accomodating to non-locals.	4.1%
3. Fishing is slow.	3.9%
4. Beautiful area.	3.2%
5. Not too crowded.	2.6%
6. Fish caught here are excellent eating.	2.2%
7. Too many out-of-state people.	1.4%
8. More stores should have area maps.	0.7%
9. Area businesses should try to stay open after the salmon season.	0.3%
10. Benzie Chamber of Commerce does a great job.	0.1%
11. Nature trail at Otter Creek is great.	0.1%

Grand Traverse County

In Grand Traverse County we interviewed shore anglers at Clinch Park, along the Boardman River from its mouth upstream to the first dam and along the breakwall at the mouth of the Boardman River. All three of those areas are within Traverse City. The average aggregate (all species) catch rate (fish per day) for all anglers at Clinch Park was 0.31 fish, 1.27 fish on the Boardman River and 0.28 fish along the breakwall at the mouth of the Boardman River.

Non-residents accounted for 5% of the use at Clinch Park, 33% of the use on the Boardman River and 2% of the use at the mouth of the Boardman River. Most of the non-resident use comes during the fall run of chinook salmon on the Boardman River.

Table 18. Shore anglers' average daily expenditures made in Grand Traverse County.

Type of expenditure	Grand Traverse County
Major fishing equip.	.62 (.47)

Table 18 continued:

Type of expenditure	Grand Traverse County
Tackle-small gear	1.18 (1.22)
Licenses	.24 (.34)
Camping	.09 (.36)
Lodging	.05 (.32)
Restaurants	.22 (.67)
Groceries	1.27 (1.41)
Beer	.34 (.28)
Vehicle gas	1.42 (2.21)
Miscellaneous	.25 (.39)
Family	.02 (.18)
Total	5.70
Non-resident total	(7.85)

The total estimated gross expenditures in Grand Traverse County of all shore anglers were:

4,403 angler days X $5.70 per angler day = $25,097

The estimated gross expenditures in Grand Traverse County of all non-resident shore anglers were:

1,249 angler days X $7.85 per angler day = $9,805

Ninety-eight percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Sixty-seven percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 19. Grand Traverse shore angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Need more bait shops.	2.1%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Need restrooms at Boardman Dam.	3.3%
2. Clean up the trash around the Boardman Dam.	2.7%
3. Need restrooms at mouth of Boardman River.	2.4%
4. Install benches at the Boardman Dam.	2.1%
5. Clean up the Boardman River.	1.5%
6. Allow snagging.	1.5%
7. Plant more fish.	1.2%
8. Plant more brown trout.	0.9%
9. Need a fish ladder on the Boardman Dam.	0.9%
10. No ladder on the Boardman Dam.	0.6%
11. Enforce no snagging.	0.6%
12. Need more boat ramps.	0.3%
13. Build a pier at the mouth of the Boardman River.	0.3%

III. General responses.

Response	% of interviewed anglers
1. Likes the improvements along the Boardman River in Traverse City.	4.5%
2. Likes the area.	3.9%
3. Good fishing.	2.4%

BOAT FISHING

In all three counties boat fishing accounted for the largest proportion of angler use and economic impact. Between 60-80% of total angler days were attributable to boat fishing in all three counties. Boat anglers also had the highest average daily expenditures: $17.20 in Manistee County, $22.03 in Benzie County and $10.05 in Grand Traverse County. The large economic impacts associated with the boat fishery are due to the high levels of use and the predominance of non-residents among the boat fishing group. Non-residents accounted for 86% of the boat use in Manistee County and 94% of the boat use in Benzie County. Not only were most of the boat anglers non-residents, but they also tended to be on longer trips than the other fishery groups, which accounts for their larger average daily expenditures.

The predominance of boat fishing is not surprising. Manistee and Benzie Counties have historically been preeminent boat fishing locations, which over the years have built-up a loyal clientele of Lake Michigan anglers. Grand Traverse County at one time also had such a distinction, but recent gill-netting has all but eliminated that county's reputation. In addition to the good fisheries on Lake Michigan for salmon and trout, the connecting and substitute lakes we included in our study also offer a variety of very productive fishing opportunities for the angler with a boat.

Tables 20, 22 and 24 list the average daily expenditures made by boat anglers in each of the three counties for a number of categories of purchases. The averages are for the entire population of anglers (resident and non-resident), whereas the figures in parentheses are the average non-resident expenditures. Tables 21, 23 and 25 list boat anglers' comments about their perceptions of the adequacy of both private and public facilities and services in each of the three counties.

Boat anglers spent a total of 112,484 angler days and $1,934,725 in Manistee County, 64,307 angler days and $1,416,683 in Benzie County, and 18,482 angler days and $132,886 in Grand Traverse County. Of those totals non-residents spent 96,136 angler days and $1,846,773 in Manistee County, 60,449 angler days and $1,397,581 in Benzie County, and 6,654 angler days and $66,873 in Grand Traverse County.

Manistee County

Boat anglers were interviewed in the Manistee Lake area at the First Street launch ramp, the Arthur Street launch, the Insta-launch ramp, Coho Bend, Penny Park and the DNR Stronach launch. On the Big Manistee River they were interviewed at Tippy Dam, the High Bridge launch, Bear Creek, River Road and Blacksmith

Bayou. On Portage Lake they were interviewed at the Onekama marina and on Arcadia Lake at the Arcadia marina.

For those anglers who said they were fishing for salmonids, the average aggregate salmonid catch was 0.9 fish per angler day. For those anglers who said they were fishing for non-salmonid species, their average aggregate non-salmonid catch was 5.7 fish per angler day. From our conversations with anglers, the study period was fairly typical in terms of angler success.

Table 20. Boat anglers' average daily expenditures made in Manistee County.

Type of expenditure	Manistee County
Major fishing equip.	1.42 (1.51)
Tackle-small gear	2.56 (2.77)
Licenses	.32 (.46)
Slip fees	.13 (.15)
Launch fees	1.36 (1.41)
Boat gas and oil	2.83 (3.16)
Camping	.54 (.73)
Lodging	.92 (1.08)
Restaurants	.86 (.73)
Groceries	1.68 (2.09)
Beer	1.13 (.88)
Vehicle gas	3.21 (3.64)
Miscellaneous	.26 (.35)
Family spending	.11 (.18)
Total	17.20
Non-resident total	(19.21)

The total estimated gross expenditures in Manistee County of all boat anglers were:

112,484 angler days X $17.20 per angler day = $1,934,725

The estimated gross expenditures in Manistee County of all non-resident boat anglers were:

96,136 angler days X $19.21 per angler day = $1,846,773

Ninety-one percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Sixty-nine percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 21. Manistee boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Longer business hours.	5.2%
2. Gas prices are too high.	4.8%
3. Tackle store prices too high.	4.3%
4. Poor selection of gear in tackle stores.	3.5%
5. Need bait shop near launch site.	3.1%
6. Advertize the fishing more.	1.9%
7. Need better restaurants.	1.2%
8. Need a concession stand at First St. launch in fall.	1.1%
9. Need more gas stations.	0.7%
10. Need a place to fix motors.	0.1%
11. Area stores not good about returns.	0.1%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Plant more salmon.	18.4%
2. Stop the gillnetting.	11.3%
3. Need more boat launches.	7.8%
4. Plant more steelhead.	6.7%
5. Need more fish cleaning stations.	5.4%
6. Lower license fees.	5.1%

Table 21 continued:

Responses	% of interviewed anglers
7. Launching should be free for locals.	3.4%
8. Stop charging to park.	2.1%
9. Allow camping overnight at First St. launch.	1.4%
10. Need more Conservation Officer patrols.	1.3%
11. Stop overnight camping at First St. launch.	1.1%
12. Free launching for senior citizens.	1.1%
13. Enforce no snagging.	0.9%
14. Regulate boat traffic.	0.8%
15. Need more and better weather reports.	0.5%
16. Plant more walleye.	0.4%
17. Enforce boat speed limits.	0.2%
18. DNR should not sell fish.	0.2%
19. Coast Guard needs to be more alert.	0.1%
20. Build an artificial reef.	0.1%
21. Need a boat landing above Tippy Dam.	0.1%

III. General responses.

Response	% of interviewed anglers
1. Fishing was great.	21.2%
2. Beautiful area.	13.4%
3. Great facilities.	8.2%
4. Fishing was poor.	4.6%
5. Friendly people in area.	3.3%
6. Too crowded.	2.7%
7. Too many people from out-of-state.	1.9%
8. Plenty of parking.	1.4%
9. Like the restaurants and shops close by.	0.8%
10. The fish are great eating.	0.7%
11. Need more fishing contests.	0.5%
12. Stop commercializing the sport fishing.	0.3%
13. Like the Coho Bend facilities.	0.1%

Table 21 continued:

Responses	% of interviewed anglers
14. Local fishermen could help outsiders more.	0.1%
15. Tackle stores in Wellston have a good selection of gear.	0.1%

Benzie County

Boat anglers were interviewed on Upper and Lower Herring Lakes, at the Frankfort municipal launch, the Elberta municipal launch and the mouth of the Platte River. Boat anglers had an average aggregate catch rate of 1.7 fish per angler day. From our conversations with anglers, the study period was fairly typical in terms of angler success.

Table 22. Boat anglers' average daily expenditures made in Benzie County.

Type of expenditure	Benzie County
Major fishing equip.	1.93 (2.05)
Tackle-small gear	2.88 (2.96)
Licenses	.57 (.64)
Slip fees	.17 (.07)
Launch fees	1.28 (1.47)
Boat gas and oil	2.72 (2.88)
Camping	1.17 (1.24)
Lodging	1.39 (1.45)
Restaurants	.94 (1.01)
Groceries	2.13 (2.25)
Beer	1.76 (1.68)
Vehicle gas	3.72 (3.89)

Table 22 continued:

Type of expenditure	Benzie County
Miscellaneous	.96 (1.07)
Family spending	.41 (.53)
Total	22.03
Non-resident total	(23.12)

The total estimated gross expenditures in Benzie County of all boat anglers were:

64,307 angler days X $22.03 per angler day = $1,416,683

The estimated gross expenditures in Benzie County of all non-resident boat anglers were:

60,449 angler days X $23.12 per angler day = $1,397,581

Ninety-seven percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Seventy-five percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 23. Benzie boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Prices are too high.	8.4%
2. Area businesses are only interested in making a buck; not very friendly.	5.6%
3. Restaurants need longer hours.	3.2%
4. Tackle stores need longer hours.	2.7%
5. Tackle stores have poor selection of gear.	1.3%
6. Local businesses should stand behind their merchandise when it malfunctions.	0.2%
7. Businesses should do more to attract people to this area.	0.1%
8. Need better boat repair services.	0.1%

Table 23 continued:

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Plant more salmon.	14.8%
2. Stop the gillnetting.	8.2%
3. Need more fish cleaning stations.	8.1%
4. Build a breakwall at the mouth of the Platte River.	4.2%
5. DNR sells too many fish.	3.9%
6. Improve the boat channel on the Platte River.	2.9%
7. Need more launch ramps on the Platte River.	2.2%
8. License fees are too high.	1.5%
9. Put out more trash barrels.	1.4%
10. Pick up trash more often.	1.2%
11. Keep tissue in the outhouses.	0.6%
12. Need a harbor at the mouth of the Platte River.	0.3%
13. Need better weather reports.	0.2%
14. Need more Conservation Officers.	0.2%
15. Platte River Park needs flush toilets and showers.	0.1%
16. Put electricity in at Sleeping Bear Dunes.	0.1%
17. Liked it better when Platte River Park was a state park.	0.1%
18. Plant more fish in Grand Traverse Bay.	0.1%

III. General responses.

Response	% of interviewed anglers
1. Great fishing.	14.7%
2. Beautiful area.	12.5%
3. Platte and Betzie Rivers are the best in the state.	6.9%
4. Friendly people.	3.1%
5. Not crowded.	2.4%
6. Fishing is poor.	1.8%

Table 23 continued:

Responses	% of interviewed anglers
7. Too many people from out-of-state.	1.1%
8. Fish are good eating.	0.7%
9. Frankfort is the friendliest place to visit and fish.	0.2%
10. Do not like inconsiderate fishermen.	0.1%

Grand Traverse County

Boat anglers were interviewed at the Milliken Park boat launch, at the Bayview Inn launch, at the Waterfront launch, at Four Mile Rd., at the Acme launch ramp, at the Ember's Marina, at Clinch Park and at Bower's Harbor. Boat anglers had an average aggregate catch rate of 2.1 fish per angler day, most of which were whitefish. From our conversations with anglers, the study period was fairly typical in terms of angler success.

We were intrigued by the whitefish sport fishery which local people have developed. Although the decimation of the lake trout stocks by commercial gillnetters has severly effected the Grand Traverse Bay sport fishing industry, the local fishermen have shifted their efforts to the whitefish stocks and with favorable results. With the absence of any ice during the winter of our study period, many locals continued to fish for whitefish fronm their boats. Local fishermen have developed their techniques to the point where they have developed a very viable fishery. The whitefish is a very fine tablefish, and we believe with proper local cooperation and marketing more non-resident participation could be solicited for that fishery.

Table 24. Boat anglers' average daily expenditures made in Grand Traverse County.

Type of expenditure	Grand Traverse County
Major fishing equip.	.47 (.39)
Tackle-small gear	.82 (1.27)
Licenses	.22 (.48)
Launch fees	.09 (.12)
Boat gas and oil	1.47 (1.64)

Table 24 continued:

Type of expenditure	Grand Traverse County
Camping	.12 (.37)
Lodging	.08 (.29)
Restaurants	.34 (.82)
Groceries	.77 (1.14)
Beer	.38 (.52)
Vehicle gas	1.91 (2.33)
Miscellaneous	.36 (.44)
Family spending	.16 (.24)
Total	7.19
Non-resident total	(10.05)

The total estimated gross expenditures in Grand Traverse County of all boat anglers were:

18,482 angler days X $7.19 per angler day = $132,886

The estimated gross expenditures in Grand Traverse County of all non-resident boat anglers were:

6,654 angler days X $10.05 per angler day = $66,873

Ninety-nine percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Eighty-five percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 25. Grand Traverse boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Ember's should make their restrooms available to fishermen without having to buy a meal.	0.5%
2. Bayview Inn should make their restrooms available to fishermen.	0.5%
3. Bower's Harbor marina gas prices too high.	0.5%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Repair the Milliken Park launch ramp.	9.5%
2. Plant more fish.	5.0%
3. Dredge the Milliken launch.	3.5%
4. Need more parking at Milliken launch.	2.0%
5. Plant more perch.	1.5%
6. Stop the gillnetting.	1.0%
7. Plant more lake trout.	1.0%
8. Repair the Bayview Inn launch.	0.5%
9. License fees are too high.	0.5%

III. General responses.

Response	% of interviewed anglers
1. Beautiful area.	4.5%
2. Not crowded.	2.0%
3. Resonable prices.	1.0%
4. Likes Bower's Harbor area.	0.5%
5. Fish still have lamprey scars.	0.5%

MANISTEE FOUL-HOOK FISHING

During the fall chinook salmon run on the Big Manistee River a legal foul-hooking fishery opens on September 10 along a short stretch of the river below Tippy Dam near Wellston. The foul-hook fishery there is characterized by heavy use, and much of it by people from downstate Michigan and other states. We estimated non-residents accounted for 88% of the use at Tippy Dam.

We sampled the foul-hooking fishery separately for two reasons. First, it represents a significant portion of the fishing effort found in that area of Manistee County during the fall season. Second, the controversy continues to rage as to the actual benefits a foul-hook fishery provides communities in proximity to the fishery. We estimated the foul-hook anglers at Tippy Dam spent 5,722 angler days and $125,541 in Manistee County. Non-residents accounted for 5,035 angler days and $121,142.

Table 26. Foul-hook anglers' average daily expenditures made in Manistee County.

Type of expenditure	Manistee County
Major fishing equip.	2.27 (2.43)
Tackle-small gear	3.58 (3.74)
Licenses	2.40 (2.71)
Camping	1.62 (1.84)
Lodging	2.05 (2.20)
Restaurants	1.12 (1.26)
Groceries	3.08 (3.44)
Beer	.97 (1.15)
Vehicle gas	2.92 (3.16)

Table 26 continued:

Type of expenditure	Manistee County
Miscellaneous	1.39 (1.51)
Family spending	.54 (.62)
Total	21.94
Non-resident total	(24.06)

The total estimated gross expenditures in Manistee County of all foul-hook anglers were:

5,722 angler days X $21.94 per angler day = $125,541

The estimated gross expenditures in Manistee County of all non-resident foul-hook anglers were:

5,035 angler days X $24.06 per angler day = $121,142

Ninety-three percent of all the anglers interviewed felt the local businesses provided adequate services and facilities. Eighty-one percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 27. Manistee foul hook angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Businesses need to have longer hours.	5.1%
2. Need better restaurants.	3.3%
3. Need a bait shop at the site.	2.7%
4. Tackle prices are too high.	1.2%
5. Need more gas stations.	0.9%
6. Need a concession stand near the site.	0.6%

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Do not run power plant so often or for so long.	9.6%

Table 27 continued:

Responses	% of interviewed anglers
2. Plant more salmon.	8.4%
3. DNR has too much authority.	4.5%
4. Do not charge to park.	2.7%
5. Clean the restrooms.	1.8%
6. Legalize snagging everywhere.	1.5%
7. Clean up the river.	1.5%
8. Need more parking.	1.2%
9. Need tissue in outhouses.	0.6%
10. Need more trash barrels.	0.6%
11. License fees too high.	0.6%

III. General responses.

Response	% of interviewed anglers
1. Great fishing.	15.9%
2. Too many snags.	9.3%
3. Beautiful area.	5.4%
4. Poor fishing.	2.4%
5. Too many people from out-of-state.	1.5%
6. Fish are fighters.	0.9%
7. Too crowded.	0.9%
8. Too much line in the river.	0.6%
9. Clean up the town.	0.3%

SECONDARY IMPACTS

The economic impact of angling is not limited to the direct expenditures of anglers. The money they spend has a multiplying effect as it circulates through the local economy. Money initially spent by anglers adds to the gross revenue received by local merchants. The merchants in turn spend some of their revenue locally and some elsewhere. That local respending becomes part of other merchants' gross revenue, and so on. Successive rounds of spending, beginning with the anglers and continuing with community merchants will in effect multiply the impact of anglers' original expenditures.

The scale of this multiplier effect depends on a number of factors, including the mix of businesses (i.e., manufacturing-service-retail ratios), their integration (i.e., manufacturing-distributing-retailing-servicing linkages), and the distribution of the original spending across area businesses. Depending on the scale of those factors, successive proportions of the income the counties receive as angler expenditures will leave the area as payment for imported goods and services.

Diamond and Chappelle (1981) did an input-output analysis of many of the economic sectors in the Manistee County economy. We used a multiplier of 2.0, which is conservatively less than all the multipliers estimated by them for the Manistee economy. In Tables 28, 29 and 30 we first multiply non-resident anglers' expenditures by 2.0 to estimate total direct and indirect gross revenue for each county attributable to non-resident angling.

Personal income can be estimated from gross revenue. Pearse and Laub (1969) and Kalter and Lord (1968) found personal income to range from 28% to 51% of gross revenue. We selected an intermediate value of 35%.

Table 28. Estimated gross revenue and personal income attributable to non-resident angler expenditures in Manistee County.

Angler Expenditures		Multiplier		Gross Revenues
$2,219,347	X	2.00	=	$4,438,694
Gross Revenues		**Income Component**		**Personal Income**
$4,438,694	X	0.35	=	$1,553,543

Table 29. Estimated gross revenue and personal income attributable to non-resident angler expenditures in Benzie County.

Angler Expenditures		Multiplier		Gross Revenues
$1,749,661	X	2.00	=	$3,499,322
Gross Revenues		**Income Component**		**Personal Income**
$3,499,322	X	0.35	=	$1,224,763

Table 30. Estimated gross revenue and personal income attributable to non-resident angler expenditures in Grand Traverse County.

Angler Expenditures		Multiplier		Gross Revenues
$76,678	X	2.00	=	$153,356
Gross Revenues		**Income Component**		**Personal Income**
$153,356	X	0.35	=	$53,675

RECOMMENDATIONS

Manistee, Benzie and Grand Traverse Counties have been at the forefront of the Lake Michigan fisheries development ever since it began in the mid-60's. Some of the first plants of salmon were made in those counties. It is not surprising then to find such significant impacts in Manistee and Benzie Counties, because many anglers from all over Michigan and other states have developed a tradition of fishing in those areas. Sad to say, but until five years ago, that was also the case for Grand Traverse County.

As a community Traverse City has probably not been affected a great deal by the loss of its sport fishery. The area has such a diverse economy and even other attractive recreational pastimes, that even a 10 to 15-fold increase in impacts would scarcely have any major effect. However, if such were the case in Benzie County, which does not have a broad economic base, the effect would certainly be more severe. Therefore, it behooves Benzie County, and to a lesser degree Manistee County, to be on guard against a similar fate. Large, healthy fish stocks in an area are the basis for a viable sport fishing industry. Without them there is simply no way there will be anything more than a local fishery.

While there was really not much Grand Traverse County could do to prevent the loss of its lake trout fishery, the County is still in a position to profit from its whitefish resources and projected increases in salmon numbers. The Department of Natural Resources has recently initiated new changes in its stocking program of salmon. With some exceptions, they are concentrating the bulk (numbers) of their plants into a few tributaries.

The reasons for this are 1) they believe there is significant natural reproduction of chinook salmon on many of Michigan's Great Lakes tributaries which will sustain local fisheries, 2) the migratory patterns of coho salmon in particular are such that even though they are planted in a few streams, they will be available to most Michigan Great Lake fishing centers, and 3) by concentrating the bulk of returning fish there can be a controlled harvest of excess fish at state-run weirs, thereby voiding the argument that snagging is the only viable means of harvesting fish that make it into the rivers. Regardless of the merits of the DNR's reasons, the policy changes pose significant changes for many coastal communities as regards available fish stocks, Grand Traverse County being one.

As part of the DNR's new plan, East Jordan received a plant of 350,000 chinook salmon (the Boardman River itself received a plant of 50,000), which will certainly provide substantial fishing opprtunities beginning this next fall. From personal conversations with the few remaining charter captains in Traverse City, we learned that for the past two summers they have noticed a definite increase in their chinook salmon take; primarily because

they stopped fishing for what few lake trout there were and began targeting the salmon. The East Jordan plants should augment their success tremendously.

Once local fishermen begin to establish the viability of the expected new salmon fishery, the vested interests in Traverse City should be ready to begin agressively marketing that fishery to its former lake trout clientele. It is quite probable those who use to fish for lake trout on Grand Traverse Bay did not stop fishing when the lake trout declined, they simply fish somewhere else now. The Traverse Bay area has enough other features to establish its uniqueness from other areas of the state, what is missing is simply a consistantly good fishery. If the fish stocks are there and it is promoted well, the former levels of non-resident angling use would likely be reestablished.

Although Manistee and Benzie Counties still have their respective fisheries, they should be no less concerned than Grand Traverse County. The new stocking policies may also impact them. Manistee County could lose the Tippy Dam foul-hook fishery, which for communities such as Wellston may be a serious economic blow. In Benzie County the Platte River will continue to receive 1 million coho, which will provide some measure of security in fish stocks, although the fish are available for only a few weeks as they finish their Lake Michigan migration. However, the concern is that without chinook plants (there is a question as to how much natural reproduction there is) there will not be a steady fishery available throughout the spring and summer (which is of particular concern to charter captains). The same holds true for Manistee County. Again, the bottom line for an economically viable sport fishery is the long-term availability of sufficiently large fish stocks.

Given an adequate fishery the key stratagem for increasing economic impacts is to market the fishery and whatever attributes establish that area's uniqueness to out-of-county angler markets, and especially <u>out-of-state</u> anglers. The principle is that people who come a longer distance, stay a longer time and spend more money. The reason for targeting out-of-state is that from the state perspective one is not then "robbing Peter to pay Paul" If all a county does is attract anglers who would have been fishing somewhere else in Michigan, then the state really gains nothing but income redistribution. The key is to attract money which would not otherwise have been spent in Michigan.

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APPENDIX A

Angler Questionnaire

ANGLER QUESTIONNAIRE

_____ Keypunch number

For shore, pier, or ice fishing:
If first interview write "start", if last interview, note number of anglers left _____

Number of anglers skipped _____

1. Site _____ 1 2

2. Type of fishing _____ (ice,pier,boat,marina,shore) 3 4

3. Day of week (weekday = 1, weekend or holiday = 2) 5

4. Month/Day 6 7 / 8 9

5. How many fish have you caught today? 10 11
Number of each species:

Coho ___ 12 Chinook ___ 13 Lake trout ___ 14 Steelhead ___ 15 Brown trout ___ 16 LM Bass ___ 17

SMBass ___ 18 N.Pike ___ 19 Musky ___ 20 Walleye ___ 21 Perch ___ 22 23 Bluegill ___ 24 25

Panfish ___ 26 27 Other _____ 28 29

6. How many hours do you plan on fishing today? 30 31
(Do not ask boat fishermen this question.)

7. Where are you from? County _____ 32 33

State _____ 34 35

8. How many miles is it from your home to here? 36 37 38 39
(Double the miles answered and enter)

9. Is this strictly a fishing trip from home? If "yes", enter 100, if not ask, "Percentage-wise, how much is the purpose of your trip for fishing?" 40 41 42

10. Are you in this county only to fish? If "yes", enter 100, if not ask, "Percentage-wise, how much is your purpose in this county to fish?" 43 44 45

11. If you could split the purpose of your fishing between doing it "for the sport", or for the food, what % would you assign sport? 46 47 48

12. How did you learn about the fishing here? _____ 49 50

13. Have you fished in this county before? (yes = 1, no = blank) 51

14. Will you fish here again? (maybe=2) 52

15. How many times in a year do you fish in this county? 53 54 55
For shanty anglers, "How many times do you plan to use the shanty?

16. What time or season of the year do you do most of your fishing? _____ 56

17. If angler is not here just to fish, "What are two other purposes for this trip"? _____ _____ 57 58

59 60

18. What species of fish are you particularly trying to catch today?

_____ ___61___62

19. For one interview in a boat group, " How long is the boat?" ___63___64

20. For boat and shanty groups, " How many in the party fished?" ___65___66

21. How many days will you be fishing in this county on this trip? ___67___68

22. If staying overnight, " What accomodations do you have?" ___69___70

_____

23. Is the angler snagging? ___71___ % of fishing devoted to snagging? ___72___73___74

24. How many days will this trip last? ___75___76 Shanty angler? ___74 2nd card

25. How many hours have you already fished today? ___75___76 2nd card

26. For one interview in a boat group, "What body of water did you just fish on? _____ ___71___

EXPENDITURES - For this trip	Home			En route			This county		
A. Major fishing equipment (rods, reels downriggers)	1	2	3	4	5	6	7	8	9
B. Small fishing equipment (line lures, bait)	10	11	12	13	14	15	16	17	18
C Fishing license	19	20	21	22	23	24	25	26	27
D. Boat rentals	28	29	30	31	32	33	34	35	36
E. Slip fees	37	38	39	40	41	42	43	44	45
F. Launching fees	55	56	57	58	59	60	61	62	63
G Boat gas, oil, etc (snowmobile in winter)	64	65	66	67	68	69	70	71	72
H Camping and parking fees	1	2	3	4	5	6	7	8	9
I. Lodging	10	11	12	13	14	15	16	17	18
J Restaurants	19	20	21	22	23	24	25	26	27
K Grocery food and snacks	28	29	30	31	32	33	34	35	36
L Beer	37	38	39	40	41	42	43	44	45
M Vehicle gas. oil etc	46	47	48	49	50	51	52	53	54
N Miscellaneous (cigs, sundries, entertainment, etc)	55	56	57	58	59	60	61	62	63
O Family spending	64	65	66	67	68	69	70	71	72

24 Are the prices businesses charge in this county on the average more, less or the same as you would expect to pay elsewhere? (more = 1, less = 2, same = 3) ___ 1

25. Do you think the businesses here provide adequate services and facilities for you? (yes = 1, no = blank) ___ 2

26. If no, list your suggestions for improvement?

1 _____ ___ 3 ___ 4 ___ 5 ___ 6

2 _____ ___ 7 ___ 8 ___ 9 ___ 10

3 _____ ___ 11 ___ 12

4 _____

5 _____

27 Do you think the government agencies here provide adequate facilities and services for you? ___ 13

28 If no, list your suggestions for improvement?

1 _____ ___ 14 ___ 15 ___ 16 ___ 17

2 _____ ___ 18 ___ 19 ___ 20 ___ 21

3 _____ ___ 22 ___ 23

4 _____

5 _____

29 Was there any information you needed about this area, but could not find? _____ ___ 24 ___ 25 ___ 26 ___ 27

30 Any other comments about what you either like or don't like about fishing here?

1 _____ ___ 28 ___ 29 ___ 30 ___ 31

2 _____ ___ 32 ___ 33 ___ 34 ___ 35

3 _____ ___ 36 ___ 37

4 _____

5 _____

31 Are you married? ___ 49

32. If so, what percentage of the time does your spouse accompany you? ___ 38 ___ 39 ___ 40

33 When spouse or family are here with you, what are they doing while you fish? _____ ___ 41 ___ 42 ___ 43 ___ 44

34 Age ___ 45 ___ 46 35. Sex (M=1, F=2) ___ 47 36 Income $ _____ ___ 48

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