ECONOMIC IMPACTS OF SPORT FISHING IN MUSKEGON AND OTTAWA COUNTIES

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

by

Scott W. Jordan and Daniel R. Talhelm

Department of Fisheries and Wildlife
Michigan State University
East Lansing, Michigan

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SUMMARY

This study estimates the economic impacts of angling in Muskegon and Ottawa Counties for Great Lakes fish for one year from October, 1981 to October, 1982. For each of fourteen Great Lakes-related fisheries we estimated 1) angling effort, 2) itemized expenditures by county residents and non-residents at home, en route, and in the county fished, and 3) anglers' opinions about local businesses, government agencies and other matters in general. We estimated that anglers spent about $5 million for 200,000 angler days in Ottawa County, $4 million of which was spent in the county. Anglers spent about $3 million for 150,000 angler days in Muskegon County, about $2 million of which was spent in the county. Angling during our sample year was apparently unusually poor, so our spending estimates may be lower than a typical year. In-county spending attributable to the fourteen fisheries is summarized as:

	Location			
Fishery	Whitehall/ Montague	Muskegon	Grand Haven	Holland
Ice fishing	35,000	82,000	31,000	23,000
Gt. Lk. boat	520,000	710,000	1,900,000	880,000
Pier	48,000	56,000	280,000	120,000
Gt. Lk. charter	na	na	410,000	na
shore/bayou	na	na	660,000	na
TOTAL	$603,000	$848,000	$3,281,000	$1,023,000

na means that the expenditures were not estimated. Charter figures will be added when available.

INTRODUCTION

As Michigan's manufacturing-based economy continues to suffer from the current recession, the economic contribution of recreation-tourism industries in Michigan takes on increasing significance in many localities. 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. Many of Michigan's coastal communities benefit in varying degrees from the influx of angler dollars. In a prior study of the economic impacts of Great Lakes sport fishing in Alcona County (Jordan and Talhelm, 1982), we found that in at least that rural area, where the economic base was restricted and fishing pressure was great, the local economy was substantially impacted by angler expenditures. In the more populous and industrialized areas which are the focus of this investigation, we found that whereas the total dollar impacts were several times greater than they were in Alcona County, their impact relative to the much larger overall local economy was slight. If anglers' dollars were not available, many residents in this area would scarcely notice the difference.

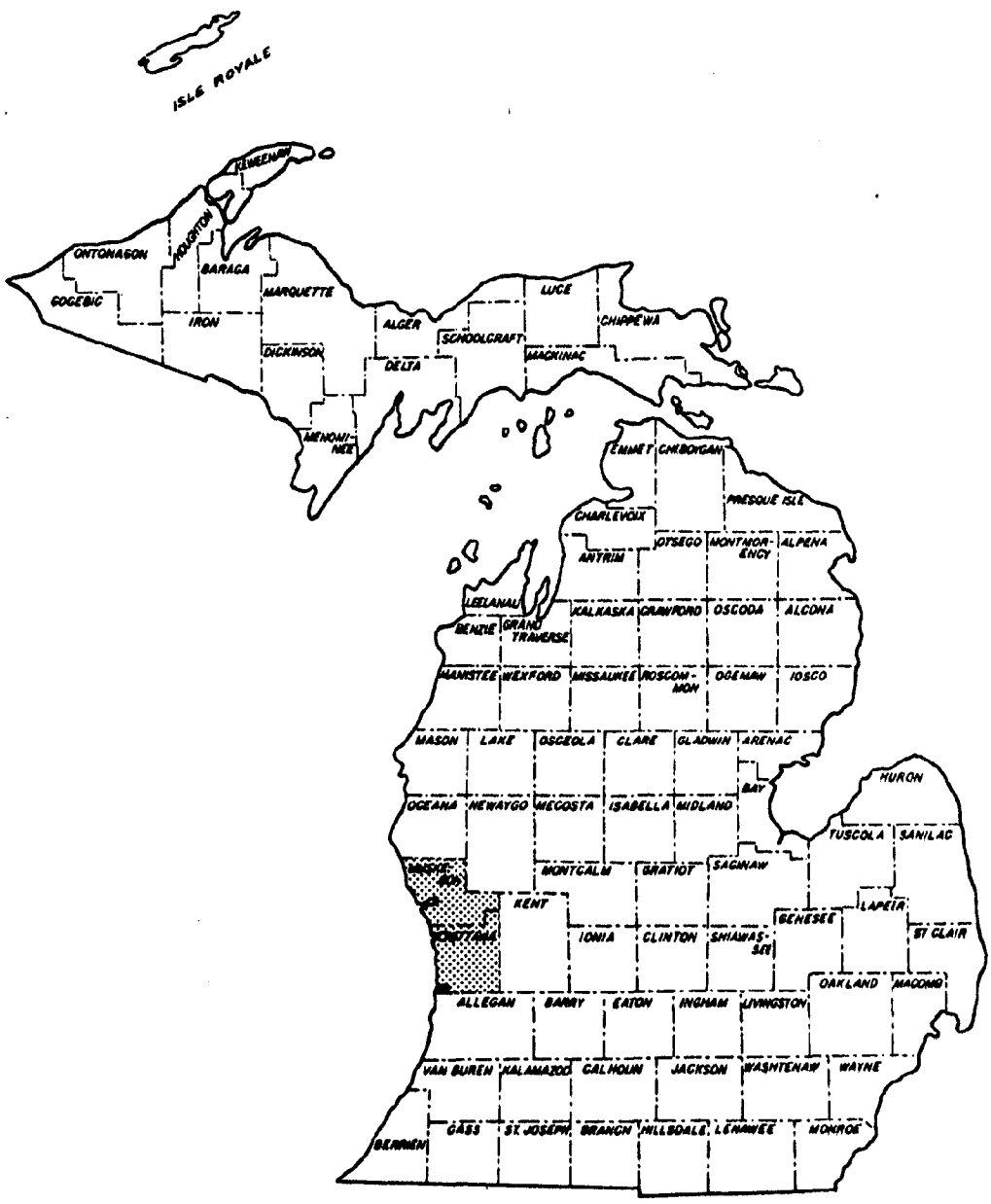
This study is similar to the previous investigation of Great Lakes sport fishing economic impacts done in Alcona County, Michigan. Alcona County (population 10,000) is located on Lake Huron in the northeast corner of Michigan's Lower Peninsula. That study was initiated when local businesses became concerned that

local residents and governement officials incorrectly percieved that Great Lakes sport fishing was of no benefit to Alcona's economy. The results of that study showed Great Lakes anglers spent over $1.3 million per year in Alcona County, and that those dollars were distributed over a wide spectrum of the local business community. An important aspect of that study was that it used the angler as its information source, which gave added credibility to the estimated use and dollar amounts. Also, because of the personal interviews done with anglers, the local communities were able to document and address those issues and problems which were of particular concern to the anglers themselves.

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. Muskegon and Ottawa counties are located midway on the lower peninsula's Lake Michigan shoreline (Figure 1).

The Muskegon-Ottawa 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 resource and cultural attractions. The character of the communities along the Lake Michigan shoreline range from the "small town" type represented by Whitehall-Montague to the relatively "modern urban" type represented by Muskegon. Because of the difference in communities and our perceptions of local concerns to maintain civic autonomy in the study, the survey efforts were segregated by four municipal areas; Holland and Grand Haven in Ottawa County, and Muskegon and Whitehall-Montague in Muskegon County. Throughout this report they will be refered to as the sampling areas.

Figure 1. Muskegon-Ottawa Study Area.



The fishing opportunities available in those four cities are much more varied than the stictly open-water salmonid fishery available in Alcona County. There is a winter ice fishery for a variety of gamefish (walleye Stizostedion vitreum, northern pike Esox lucius, yellow perch Perca flavescens, crappie Pomoxis spp., and bluegill Lepomis macrochirus) on Lake Macatawa, the Pigeon River, the Grand River bayous, Muskegon Lake, and White Lake. Those same waters - all of which are connected to Lake Michigan - also offer warm-weather fishing opportunities for those same species and largemouth bass Micropterus salmoides, smallmouth bass Micropterus dolomieui, and catfish Ictalurus spp..

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

The primary goals of this investigation were to 1) estimate 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 two counties, 2) estimate the average daily expenditures by both county resident and county non-resident anglers for each of the different fisheries previously listed in each of the four municipal areas, and 3) to solicit subjective responses from anglers as to their 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 Muskegon and Ottawa 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 fishing success was much below normal in the 1981-1982 fishing year.

Ice fishing was not as good as expected in all four sampling areas, with the fishing being particularly abysmal in the Grand River bayous around Grand Haven. In the past these bayous have provided such outstanding winter fishing that they received national attention and drew thousands of anglers to the area to ice fish. This year anglers originating from outside the study area were conspicuously absent, representing only 5% of our winter sample in the bayous.

In the Muskegon area ice fishing on Muskegon Lake was also generally poor. In the northern and eastern areas of Muskegon Lake the winter walleye fishing declined after developing nicely over the past two years. We recorded very few walleye caught in our survey of winter anglers, and except for some steady activity with northern pike near the Cobb power plant, the fishing in these parts of the lake could be considered a bust. Yellow perch fishing on Muskegon Lake was at times fair, but anglers often complained that the fishing was slow and that the perch caught were mostly small ones.

Yellow perch fishing on White Lake in the Whitehall-Montague area was better than on Muskegon Lake. Although anglers at White Lake complained of the poor fishing, their average catch rate was more than twice what it was at in any of the other three sampling areas. However, the northern pike fishing on White Lake - both with hook-and-line and spears - was slow through the season.

In the Holland area in the winter the situation was the same. Anglers fishing on Lake Macatawa at times had good catches, but success was not consistant, and again the size of the fish was generally small. At Port Sheldon, catches of yellow perch on the average were better than those on Lake Macatawa.

On Lake Michigan the catch of spring steelhead and brown trout from the piers in all four sampling areas was very low, and as summer progressed, the usually good perch fishing on the piers and on the connecting lakes (Macatawa, Muskegon, and White) never

materialized. Offshore salmonid fishing was fair in May, terrible in June, not quite fair in July and August, and because of an unexplainable delay in the salmon run, was only fair in September and the first part of October. The fall pier fishing for salmonids was particularly dismal because of the late runs. Not until late October did anglers began to consistantly catch fish.

The overall poor fishing in the area during the year of this study is consistantly reflected in our calculated catch rates in the individual fisheries sections through the report. Again we believe the poor fishing in many cases restricted the influx of non-resident anglers. Therefore, we reasonably expect that many of the results from this study underestimate the sport fishing impacts associated with a "typical" year's fishing in the Muskegon-Ottawa region.

For the entire study period we estimated that anglers spent 258,203 days fishing and $4,279,314 in Ottawa County, of which 149,796 days and $3,089,406 was attributable to non-resident (out-of-county) anglers. We estimated that anglers spent 165,595 days fishing and $1,448,288 in Muskegon County, of which 32,193 days and $376,604 was attributable to non-resident anglers. Those estimates are apportioned by fishery and sampling area (city) in the different fisheries sections of this report.

The three comments expressed most frequently by anglers in all of the sampling areas were 1) something should be done to stop the indiscriminate gillnetting of Great Lakes sport fish, 2) greater numbers of fish (anglers specified many species) need to be planted, and 3) the Department of Natural Resources should not charge to launch a boat at their access facilities.

SURVEYS

Anglers were interviewed at all fishing access points within a sampling area, which were either 1) observed by us to have angling usage or 2) were pointed out by local people to be areas of fishing activity. Our four sampling areas from south to north in the study area were Holland, Grand Haven, Muskegon, and Whitehall-Montague.

In the Holland area we sampled the fishing activity on (1) Lake Macatawa, (2) Lake Michigan piers, (3) Lake Michigan (offshore salmonids) off the entrance to Lake Macatawa, (4) the Pigeon River near Port Sheldon, and (5) Lake Michigan (offshore salmonids) off the mouth of the Pigeon River. In the Grand Haven area we sampled fishing on (1) the Grand River bayous, (2) the Lake Michigan piers, and (3) Lake Michigan (offshore salmonid) off the mouth of the Grand River. In Muskegon we sampled fishing activity on (1) Muskegon Lake, (2) the Lake Michigan piers, and (3) Lake Michigan (offshore salmonid) off the entrance to Muskegon Lake. In the Whitehall-Montague area we sampled fishing on (1) White Lake, (2) the Lake Michigan piers, and (3) Lake Michigan (offshore salmonid) off the entrance to White Lake.

Anglers were questioned about their trip expenditures, their length of stay, their fishing sucess, 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, if they knew about the artificial reef and had ever fished over it, and personal information.

Ice, pier, and shore fishing

Ice, pier, and shore fishing use was estimated using a roving survey (Hayne, 1966, 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 on fishing that day, and based on (1) the probability of an interviewer encountering an angler fishing a specified number of hours, (2) the number of anglers counted on a traverse, and (3) the number of traverses of a particular fishing site done that day, the total number of anglers fishing at that site that day can be estimated. We then averaged daily estimates for each site for each season, distinquishing between weekday and weekend/holiday usage, to arrive at total estimated use for each identified fishery.

Because shore, pier, and ice anglers were usually interviewed before they had finished fishing for the day, their daily catch had to be estimated. This was done by taking the ratio of the number of hours they planned on fishing that day to the number of hours they had already fished when interviewed, and multiplying it by the number of fish they had caught at the time of the interview.

Boat fishing

Private boat angler use was estimated in two ways. The first method was used for all the offshore salmonid fishing in Lake Michigan and for the fisheries on Lake Macatawa, Muskegon Lake, and White Lake. This method was developed to specifically address a problem associated with Lake Macatawa, Muskegon Lake, and White Lake, all of which connect with Lake Michigan. The problem is that anglers departing from any of the numerous access sites and marinas on each lake could plan to fish either on Lake Michigan, the connecting lake, or both. Instantaneous counts of effort on

either the connecting lakes or Lake Michigan would be biased because: 1) counts on Lake Michigan would assume that all boats originating out of a particular sampling area were within visual range, and 2) the geography of Lake Macatawa and White Lake made it impossible to see either lake in its entirety. Furthurmore, the origins of effort on Lake Michigan would be biased if we assumed that all the boats within visual range at a sampling area had originated from that sampling area.

Therefore, from the entrances of Lake Macatawa, Muskegon Lake, and White Lake, and from the mouth of the Grand River, we counted, on randomly selected hours, the number of positively identified fishing boats heading out onto Lake Michigan. Using those counts, we calculated the average hourly number of fishing boats from each sampling area going out on Lake Michigan. By adding those hourly averages for weekdays and weekend-days repectively, we calculated average daily totals of weekday and weekend-day fishing boat trips onto Lake Michigan for each sampling area. We then multiplied the average daily totals by the number of weekdays and weekend-days in the boating season to obtain the annual number of boat trips onto Lake Michigan.

In our interviews done with boat anglers at sampling area launch sites and marinas, we noted how many people on each boat actually fished that day, and whether on that day the party fished either on Lake Michigan, the connecting lake, or both. From that information we calculated the ratio of sampled boat anglers who went out on Lake Michigan to those who did not. Using that ratio and the total estimated number of fishing boats that went out on Lake Michigan, we estimated the number of boat trips made exclusively to fish on the connecting lakes. Having estimated the total number of daily fishing boat trips on Lake Michigan and the connecting lakes, we multiplied by the average number of anglers per boat to arrive at our estimates of boat angler usage for each sampling area.

The second method was used for estimating boat angler usage on the Grand River bayous and at Port Sheldon in the Holland area. On

randomly selected days at each of the various access sites, an early morning count of boat trailers was made, to which was added the number of additional boat launchings made that day. Those total daily estimates were averaged and then multiplied by the number of days in the boating season to calculate the total number of fishing boat trips made from that access site. That estimate was then multiplied by the average number of anglers per boat fishing the bayous or at Port Sheldon to arrive at an estimate of total boat angler usage.

Charter boat fishing

A one page questionnaire for the charter boat fishery was specifically designed to be administered by the charter captains. To encourage the captains' cooperation, it was much briefer than the standard questionnaire, and was done on a party basis rather than for each individual client. The questionnaire's main focus was county expenditures. Even with the simplified form, however, few charter captains cooperated. The notable exception were some captains in the Grand Haven area. Therefore, we were able to do a thorough analysis of charter fishing impacts only in that area. In the other sampling areas we used the Grand Haven expenditures estimates and expanded them by the level of client use reported by the captains. The estimates of charter client use for all four sampling areas came from the captains' logbooks of charters for the 1982 season.

Business survey

A questionnaire was mailed to over 700 businesses in the study area for the purpose of estimating the secondary economic impacts of anglers expenditures. In the Alcona study we had used economic multipliers from the literature (Kalter and Lord, 1968; Pearse and Laub, 1969). However, in this investigation we hoped to refine our estimates of the secondary impacts by surveying the study area businesses, and then applying input-output model tables

developed by Diamond and Chappelle (1981) for the Manistee County economy to the responses we received from cooperating businesses.

In the questionnaire we asked businesses 1) their grosss annual receipts, 2) their major products and/or services and the percentage of their gross receipts attributable to each, 3) the number of full-time equivalent employees they had, 4) what percentage of their total revenues would they attribute to anglers' purchases, 5) for 26 different sectors of the economy, what percentage of their total revenues did they use for purchases in each sector, and 6) for purchases within each sector, what percentage was purchased within the county.

By using a questionnaire of this sort and by applying input-output modeling techniques, we had hoped to derive mutipliers for each category of business establishment we felt anglers patronized in the study area. In that way the secondary impacts for Muskegon and Ottawa counties could be more precisely estimated. However, as of the date of this report, too few of the questionnaires have been returned (approximately 20) for any reasonable analysis.

We suspect in part this was due to the anti-government and anti-study attitude prevalent in today's business community. Some of the returned questionnaires sported comments colorfully expounding that attitude. However, we are continuing efforts to solicit businesses' cooperation, and if a worthwhile sample is obtained we will analyze the data and append a report to this report. In lieu of the more detailed analysis, we will use the multipliers from the literature which were used in the Alcona study.

Copies of the angler, charter, and business questionnaires can be found in Appendix A.

WINTER ICE FISHING

Ice fishing did not begin in the study area until well into January 1982. The ice was unsafe until then, except on the Grand River bayous, where safe ice formed soon after Christmas. In the Holland and Grand Haven areas fishing was best for the first few weeks. After that, fishing was generally poor. In Muskegon County on Muskegon Lake and White Lake the fishing was more consistant through the season. Anglers on Muskegon Lake had marginal success, while anglers on White Lake had the best success of any of the sample areas. However, the overall concensus among anglers was that the 1981 winter season was below par.

We expected ice fishing to be a local phenomenon, with few out-of-county anglers. The overall poor fishing probably would heigthen that phenomenon. In the Holland area 8.3% of the anglers sampled were non-residents. In the three other sample areas, a surprisingly high 22-23% were non-residents. We found, however, that 78% of the non-resident anglers in Muskegon County came from Ottawa County and vice versa. Therefore, we still feel the ice fishery is predominantly a local fishery, and that the below par fishing reduced the level of use by non-residents of the study area.

Two types of ice angler use were estimated. 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 shanty at a 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 each observation of nuimber of anglers per shanty and 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.

Tables 1, 3, 5, and 7 list the average daily expenditures made by ice anglers in the four sampling areas 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 non-resident expenditures to the amounts of "new" money coming into the local economy. We beleive the local nature of the fishery and the apparent below normal participation by anglers from outside the study area explain the very low expenditure patterns.

Totals of 18,499 angler days and $54,245 were spent in Ottawa County for ice angling, and 19,608 angler days and $117,076 in Muskegon County. Of those totals non-residents spent 3271 angler days and $5197 in Ottawa County, and 4,548 angler days and $26,173 in Muskegon County.

Tables 2, 4, 6, and 8 list anglers' comments about their perceptions of the adequacy of both private and public facilities and services in the sampling area. These questions were designed to permit anglers to express their mindful concerns, rather than

to lead them into particular responses. Therefore, while the frequency of any particular response was low, each repsonse represents a conscience concern of an angler.

Holland

Ice fishing in the Holland area was concentrated off the State Park campground on Lake Macatawa. Anglers on the Pigeon River at Port Sheldon were also sampled. Non-resident anglers accounted for 8.3% of our sample.

For all anglers interviewed at both sites, 61% had caught fish on the day questioned. Anglers caught an average of 15 fish per day, 92% of which were yellow perch.

Table 1. Holland ice anglers' average daily expenditures made at home, en route, and in Ottawa County.

Type of expenditure	Home	En route	County
Major fishing equip.	--	--	.22
Tackle-small gear	--	--	.67
			(.25)
Licenses	--	--	.48
Restaurants	--	--	.54
Groceries	--	--	.04
Beer	.07	--	.13
	(.80)		
Vehicle gas	.16	--	1.00
	(1.84)		(1.25)
Miscellaneous	--	--	.11
			(.25)
Total	.23	--	3.20
Non-resident subtotal	(2.64)		(1.75)

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

7,243 angler days X $3.20 per angler day = $23,178

The estimated gross expenditures of Holland non-resident ice anglers in Ottawa County were:

630 angler days X $1.75 per angler day = $1,103

Table 2. Holland ice angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Bait stores need a wider selection of baits.	13.0%
2. Bait stores need to open earlier in the day.	6.5%
3. Need a place that will cash out of town checks.	4.3%

Seventy-eight percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. DNR should not charge to launch boats during the summer.	30.4%
2. Somehow the Indian gillnetting must be stopped.	10.9%
3. More walleye should be stocked.	4.3%
4. More muskies should be stocked.	4.3%

Table 2 continued:

Fifty-four percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

III. General responses.

Response	% of interviewed anglers
1. The yellow perch are small.	10.9%
2. Agree with salmon snagging.	4.3%
3. Holland Fish and Game Club has a good program.	2.2%
4. Enjoys the fishing here.	2.2%

Grand Haven

The ice fishing in the Grand Haven area occurs on a number of bayous, or backwater areas, of the lower Grand River. On all the bayous anglers fish primarily for bluegill, yellow perch, and crappies. On Stearns Bayou many of them spear northern pike. The Grand River bayous (Pottawatomie, Millhouse, Stearns, Bruce, Lloyds, and Spring Lake) have historically been excellent winter fishing locations. As recently as the late 1970's bluegill fishing was particularly outstanding, but has declined over the past few years. Some of the local anglers interviewed felt the recent programs of poisoning the bayous for weed control caused the poor fishing.

Fishing was good for a few weeks after "first ice" this winter, but then dropped off rapidly. Anglers said that in recent years thousands of anglers would come over the course of the ice fishing season to fish the bayous, with hundreds of people present every weekend. In our sampling we never saw more than fifty people

outside of shanties on all the bayous combined on a sample day. Although there was a season average of over 150 shanties on the bayous, most of them belonged to local residents and residents of Muskegon. Only 22.9% of our sample were non-residents, and 84% of them came from Muskegon County.

Only 43% of the anglers interviewed had caught fish on the day questioned, and the aggregate catch for all species was 5.2 fish per angler day. The catch was almost equally divided between yellow perch (30%), bluegill (25%), and crappie (32%).

Table 3. Grand Haven ice anglers' average daily expenditures made at home, en route, and in Ottawa County.

Type of expenditure	Home	En route	County
Tackle-small gear	.02	--	.67
	(.09)		(.36)
Groceries	--	--	.17
			(.18)
Beer	.21	.02	.13
	(.91)	(.09)	(.55)
Vehicle gas	.31	--	1.52
	(1.34)		(.46)
Miscellaneous	--	--	.27
Total	.54	.02	2.76
Non-resident subtotal	(2.34)	(.09)	(1.55)

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

11,256 angler days X $2.76 per day = $31,067

The estimated gross expenditures of Grand Haven non-resident ice anglers in Ottawa County were:

2641 angler days X $1.55 per day = $4,094

Table 4. Grand Haven ice angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. More tackle stores need to sell bait.	6.3%
2. Tackle stores need a wider selection of gear.	4.2%
3. Bait and tackle stores need to open earlier in the morning.	4.2%
4. Bait and tackle store prices are too high.	2.1%

Eighty-three percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Need public access to Stearn's bayou.	18.8%
2. License fees are too high.	4.2%
3. Need snow plowed at the access sites.	4.2%
4. Do not charge to launch boats in the summer.	4.2%
5. Stock walleye in the Grand River.	4.2%

Table 4 continued:

Fifty-six percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

III. General responses.

Response	% of interviewed anglers
1. The Grand Haven area has good fishing.	20.8%
2. The fishing is poor.	4.2%
3. Ban speedboats on the bayous in the summer.	4.2%
4. Property owners should not spray the aquatic weeds in the bayous.	8.3%
5. Appreciates Bill's Sport Shop plowing the Lloyd's Bayou access.	2.1%

Muskegon

Muskegon Lake had the most ice fishing activity of any of the sampling areas during 1982. We believe a major reason for the greater activity is the lake's proximity to a metropolitan area with many of its residents out of work. Many of the people we interviewed were unemployed locals.

While angler use was substantial, fishing success was only marginal. Yellow perch fishing, which accounts for most of the winter use, varied from good to poor throughout the season. The best catches were made in the southwest portion of the lake near the yaught club and sand docks, though anglers complained that the fish were too small. Pike fishing off the Cobb power plant was fair throughout the season. The walleye fishing was spotty most of the season, both off the Cobb power plant and off the North Muskegon shoreline. Two weekend yellow perch tournaments

sponsored by local sporting goods stores drew close to 1000 anglers apiece. Non-residents comprised 23.2% of our sample.

Fifty-nine percent of all anglers interviewed had caught fish on the day questioned. The aggregate catch was 6.6 fish per angler day, 94% of which were yellow perch.

Table 5. Muskegon ice anglers' average daily expenditures made at home, en route, and in Muskegon County.

Type of expenditure	Home	En route	County
Major fishing equip.	--	--	.61
Tackle-small gear	.04	--	1.94
	(.16)		(1.90)
Restaurants	--	--	.61
			(1.84)
Groceries	--	--	.49
			(.21)
Beer	--	--	.59
			(.26)
Vehicle gas	.33	--	1.07
	(1.42)		(.74)
Miscellaneous	--	--	.23
			(.79)
Total	.37	--	5.54
Non-resident subtotal	(1.58)		(5.74)

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

14,781 angler days X $5.54 per angler day = $81,887

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

3,425 angler days X $5.74 per angler day = $19,660

Table 6. Muskegon ice angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Bait stores should open earlier.	2.4%
2. Bait store prices are too high.	1.2%
3. Need an open restaurant closer to the marina in winter.	1.2%

Ninety-three percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Need winter parking at South Marina area.	15.9%
2. DNR should not charge to launch boats in summer.	13.4%
3. Plant more walleye.	7.3%
4. Need more boat launching sites on Muskegon Lake.	4.9%
5. Need more winter parking at Johnson's Point.	3.7%
6. Access sites should be plowed more often in winter.	2.4%

Table 6 continued:

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

III. General responses.

Response	% of interviewed anglers
1. The fishing is good around Muskegon.	20.7%
2. Muskegon Lake is much cleaner now.	7.3%
3. Likes having the walleyes back in Muskegon Lake.	4.9%
4. Giddings ramp and lot is nice.	3.7%
5. Still thinks Muskegon Lake is polluted.	2.4%
6. Appreciates N. Muskegon plowing the Second Street lot.	2.4%
7. Great Lakes fishing is becoming a rich man's sport.	2.4%
8. Need to promote Muskegon's fishing more vigorously.	2.4%

Whitehall-Montague

White Lake had the best ice fishing, especially for yellow perch, of all the sampling areas. Seventy-one percent of all the anglers interviewed had caught fish on the day questioned, and the aggregate catch was 20.2 fish per day. The catch rate for yellow perch was 19.2 fish per day. Most of the perch fishing activity was concentrated on the eastern end of the lake.

A fair number of shanty anglers speared and jigged for northern pike on the south side of the lake. For all of the anglers interviewed, the catch rate for northern pike was 0.3 fish per angler day.

Non-residents accounted for 23.3 % of our sample.

Table 7. Whitehall-Montague ice anglers' average daily expenditures made at home, en route, and in Muskegon County.

Type of expenditure	Home	En route	County
Major fishing equip.	--	--	.76
Tackle-small gear	.04 (.15)	--	2.22 (2.20)
Restaurants	--	--	.71 (1.10)
Groceries	.12 (.50)	--	.35
Beer	.06 (.25)	--	.76 (.15)
Vehicle gas	.91 (3.90)	--	2.32 (2.00)
Miscellaneous	.04 (.15)	--	.17 (.35)
Total	1.17	--	7.29
Non-resident subtotal	(4.95)		(5.80)

The total estimated gross expenditures of all Whitehall-Montague ice anglers in Muskegon County were:

4,827 angler days X $7.29 per angler day = $35,189

The estimated gross expenditures of Whitehall-Montague non-resident ice anglers in Muskegon County were:

1,123 angler days X $5.80 per angler day = $6,513

Table 8. Whitehall-Montague ice angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Get rid of Hooker Chemical Co.	8.1%
2. Bait shops need to open earlier	3.5%
3. Area needs more fishing contests.	1.2%
4. Area needs more boat rentals in summer.	1.2%
5. Area needs more cocktail bars.	1.2%

Ninety percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Clean the weeds out of the channel.	8.1%
2. Need to plow more parking in winter.	7.0%
3. Stock perch.	4.7%
4. Clean up White Lake.	4.7%
5. Stop the Indian gillnetting.	3.5%
6. Need a public boat launch near the mouth of White Lake.	3.5%
7. Stock more walleye.	3.5%

Forty-seven percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 8 continued:

III. General responses.

Response	% of interviewed anglers
1. Too many small fish.	11.6%
2. The fishing is poor.	9.3%
3. The people in this area are nice.	3.5%
4. The lake water is cloudy.	2.3%
5. The fishing is good.	2.3%
6. The scenery is beautiful.	2.3%

PIER FISHING

All four sampling areas 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 the four cities. 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 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, as well as 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. Finally, pier anglers fish for lake trout, which make spawning runs up some of the rivers in late fall.

In Muskegon County we estimated that over 90% of angler use was by local residents. We believe the close proximity to a large city, especially one with high umemployment, explains much of that local use. Non-residents accounted for 58% of our sample in Ottawa County. Pier fishing in Ottawa County can be excellent, especially on the Grand Haven pier, and over the years the Ottawa County piers have earned a reputation which attracts people from all around the Great Lakes region.

Fishing on the piers was generally poor for the entire year. The salmonid fishing was extremely slow, with catch rates ranging from 0.01-0.18 fish per angler day. With the exception of the

White Lake pier (15.8 fish per angler day), yellow perch fishing was also very slow, with catch rates ranging from 2.8-4.3 fish per angler day.

Tables 9, 11, 13, and 15 list the average daily expenditures made by pier anglers. We believe the average expenditures are not higher because many of the non-residents came from the adjacent county (Muskegon to Ottawa, and vice versa). Also, because many of the non-residents originated close by, they usually stayed for only one day, and whereas daily expenditures increase with longer visits, most non-residents in this case did not stay long enough to spend any appreciable amounts of money.

Totals of 49,220 angler days and $401,715 were spent in Ottawa County for pier angling, and 15,827 angler days and $104,595 in Muskegon County. Of those totals non-residents spent 28,447 angler days and $273,370 in Ottawa County, and 1,370 angler days and $7,796 in Muskegon County.

Tables 10, 12, 14, and 16 list anglers' comments about their perceptions of the adequacy of both private and public facilities in the sampling area.

Holland

The Holland piers are located where Lake Macatawa empties into Lake Michigan. The south pier in Holland is not accessible to the public. A few local residents with property near the south pier are the only people who fish there. The north pier is within the boundaries of Holland State Park, and it is only for that pier that an analysis was conducted.

For all anglers interviewed on the north pier, 40% had caught fish on the day questioned. That percentage is an average for all angling from the spring through the fall seasons. Anglers caught

an average of 2.8 fish per angler day, 99% of which were yellow perch.

Table 9. Holland pier anglers' average daily expenditures made at home, en route, and in Ottawa County.

Type of expenditure	Home	En route	County
Tackle-small gear	.09 (.17)	.04 (.08)	2.94 (3.91)
Licenses	--	--	.62 (.48)
Launch fees	--	--	.05
Boat gas and oil	--	.03 (.05)	--
Camping	--	.07 (.14)	.47 (.52)
Lodging	--	--	.18 (.31)
Restaurants	--	.15 (.30)	.23 (.29)
Groceries	.05 (.10)	.35 (.69)	1.00 (1.31)
Beer	.01 (.03)	--	.08 (.04)
Vehicle gas	.65 (1.26)	2.67 (5.20)	1.81 (2.57)
Miscellaneous	--	--	.16
Family spending	--	--	.05 (.10)
Total	.80	3.31	6.74
Non-resident subtotal	(1.80)	(6.46)	(8.51)

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

17,574 angler days X $6.74 per angler day = $121,964

The estimated gross expenditures in Ottawa County of Holland non-resident pier anglers were:

9,015 angler days X $8.51 per angler day = $76,718

Table 10. Holland pier angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Bait store prices are too high.	1.0%
2. Bait stores need to open earlier.	0.5%
3. Bait stores need to open on Sunday.	0.5%
4. A cocktail bar would be nice near the north pier	0.5%

Ninety-seven percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

Table 10 continued:

II. Responses about government agencies.

Responses	% of interviewed anglers
1. State Park admission fees are too high.	7.8%
2. Put a sidewalk out to the pier.	6.7%
3. Need bathrooms on or near the pier.	5.2%
4. Enforce NO SWIMMING off the pier.	3.6%
5. Open the restrooms earlier in the State Park.	2.6%
6. Something must be done to increase the yellow perch population.	2.1%
7. Need more parking at the State Park	2.1%
8. Somehow the Indian gillnetting must be stopped.	2.1%

Fifty-six percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

III. General responses.

Response	% of interviewed anglers
1. Need cushions on the pier.	0.5%
2. This is a nice area.	0.5%
3. The Anchorage Marina is nice.	0.5%
4. Likes the bike path into town.	0.5%
5. Thinks American Tackle Outfitters is a good tackle store.	0.5%

Grand Haven

The Grand Haven piers are located where the Grand River flows into Lake Michigan. Both piers have good access. The piers

receive heavy use because of the reputation they have of providing good fishing.

For all anglers interviewed on the north pier, 36% had caught fish on the day questioned. That percentage is an average for all species from the spring through the fall seasons. The aggregate catch for all species on days anglers were interviewed was 4.2 fish per day. Yellow perch comprised 68% of the fish we observed caught.

Table 11. Grand Haven pier anglers' average daily expenditures made at home, en route, and in Ottawa County.

Type of expenditure	Home	En route	County
Major fishing equip.	.16 (.26)	--	.57 (.47)
Tackle-small gear	.25 (.40)	.86 (1.36)	1.20 (1.46)
Licenses	.05 (.09)	.04 (.04)	.41 (.20)
Boat gas and oil	.01 (.02)	--	.01 (.02)
Camping	--	.59 (.96)	.58 (.82)
Lodging	--	.12 (.20)	.37 (.61)
Restaurants	--	.08 (.09)	1.13 (1.68)
Groceries	2.48 (4.04)	.01 (.01)	.79 (1.07)
Beer	.01 (.02)	--	.28 (.28)
Vehicle gas	1.14 (1.86)	.11 (.18)	3.00 (2.86)
Miscellaneous	.30 (.49)	--	.06 (.06)
Family spending	--	--	.44 (.59)
Total	4.40	1.81	8.84
Non-resident total	(7.18)	(2.84)	(10.12)

The total estimated gross expenditures in Ottawa County of all Grand Haven pier anglers were:

31,646 angler days X $8.84 per day = $279,751

The estimated gross expenditures in Ottawa County of Grand Haven non-resident pier anglers were: 19,432 angler days X $10.12 per day = $196,652

Table 12. Grand Haven pier angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Need a tackle store closer to the North pier.	5.3%
2. More tackle stores need to sell live bait.	4.4%
3. Tackle stores need to open earlier.	3.8%
4. Need a tackle store closer to the South pier.	2.0%
5. Tackle stores have a limited selection of merchandise.	1.8%
6. Need better bait shops.	1.8%

Eighty-two percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

Table 12 continued:

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the Indian gillnetting.	15.5%
2. Plant more steelhead and brown trout.	4.1%
3. Clean and fix N.pier restrooms.	3.5%
4. Need more parking at N.pier lot.	2.3%
5. Grand Haven needs an artificial reef.	2.0%
6. Do not charge to park at S.pier lot.	2.0%
7. Plant more walleye.	1.8%
8. Clean restrooms at municipal boat launch.	1.8%

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

III. General responses.

Response	% of interviewed anglers
1. Grand Haven is a good place to fish.	11.1%
2. The fishing is poor.	5.3%
3. North pier lot and walkway is nice.	4.4%
4. Grand Haven is a great place.	3.5%
5. The piers are nice.	2.3%

Muskegon

For all anglers interviewed on the north pier, 40% had caught fish on the day questioned. That percentage is an average for all species from the spring through the fall seasons. The aggregate catch for all species on days anglers were interviewed was 5.7 fish per day. Yellow perch comprised 75% of the fish we observed caught.

Table 13. Muskegon pier anglers' average daily expenditures made at home, en route, and in Muskegon County.

Type of expenditure	Home	En route	County
Major fishing equip.	--	--	.26
Tackle-small gear	.03	.03	1.71
	(.45)	(.43)	(.54)
Licenses	.04	.04	1.15
	(.60)	(.57)	(1.07)
Launch fees	--	--	.01
			(.18)
Camping	--	--	.02
Lodging	--	--	.15
			(2.14)
Restaurants	--	--	.57
			(2.26)
Groceries	.03	--	.70
	(.43)		(.36)
Beer	--	--	.23
			(.54)
Vehicle gas	.02	--	2.31
	(.31)		(5.50)
Miscellaneous	.01	--	.13
	(.07)		(.54)
Family spending	--	--	.08
			(1.07)
Total	.13	.07	6.26
Non-resident total	(1.85)	(1.00)	(8.53)

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

9,015 angler days X $6.26 per angler day = $56,434

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

634 angler days X $8.53 per angler day = $5,408

Table 14. Muskegon pier angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Bait stores need to open earlier.	1.5%
2. Tackle stores have a limited selection of merchandise.	1.5%
3. Need a bait store closer to the pier.	1.5%
4. Prices in the area are too high.	1.0%

Ninety-two percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the Indian gillnetting.	7.0%
2. Muskegon Lake launching ramps need to be better maintained.	3.0%
3. Move the rocks away from the pier.	2.0%
4. Do not charge to launch boats.	1.5%
5. Put a cement walk on the North pier.	1.5%
6. Do something to improve the perch fishing.	1.5%

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

Table 14 continued:

III. General responses.

Response	% of interviewed anglers
1. The fishing is poor.	3.5%
2. The Muskegon area has good fishing.	3.0%
3. Support snagging.	2.0%
4. The Muskegon area is nice.	1.5%
5. Boats come too close to the pier.	1.5%

Whitehall-Montague

For all anglers interviewed on the Whitehall-Montague piers, 84% had caught fish on the day questioned. That percentage is an average for all angling from the spring through the fall seasons. Anglers caught an average of 19.5 fish per angler day, 81% of which were yellow perch.

Table 15. Whitehall-Montague pier anglers' average daily expenditures made at home, en route, and in Muskegon County.

Type of expenditure	Home	En route	County
Tackle-small gear	.03	--	1.86
			(1.14)
Restaurants	--	--	.30
			(.02)
Groceries	.06	--	1.24
	(.63)		(.76)
Beer	--	.02	.34
		(.23)	(1.10)
Vehicle gas	.28		3.15
	(1.28)		(.11)
Miscellaneous	--	--	.18
Total	.37	.07	7.07
Non-resident total	(1.91)	(.23)	(3.13)

The total estimated gross expenditures in Muskegon County of all Whitehall-Montague pier anglers were:

6812 angler days X $7.07 per angler day = $48,161

The estimated gross expenditures in Muskegon County of Whitehall-Montague non-resident anglers were:

736 angler days X $3.13 per angler day = $2,388

Table 16. Whitehall-Montague pier angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Need a tackle store near the piers.	5.4%

Ninety-five percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Need more parking at access sites.	8.1%
2. Need restrooms on the pier.	6.8%
3. Clean up White Lake.	5.4%
4. Need boat launch at west end of White Lake.	4.1%

Seventy-four percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 16 continued:

III. General responses.

Response	% of interviewed anglers
1. Likes the Whitehall-Montague area.	4.1%
2. The fishing is poor.	2.7%

BOAT FISHING

In all of the sampling areas boat fishing accounted for the largest proportion of angler use and economic impact. The percentage of angler days ranged from 80% in Whitehall-Montague to 53% in Grand Haven. Boat anglers also had the highest average daily expenditures, the average in-county expenditures for all four sampling areas being $22.00 per day.

Holland

Boat anglers' use estimates for the Holland area were based on three subsets of anglers; those that launched their boats on Lake Macatawa and either 1) fished on Lake Michigan at some time during that day, or 2) fished only on Lake Macatawa, or 3) those that launched their boats at Port Sheldon and fished on Lake Michigan. All three subsets of anglers were analyzed as one group for the expenditure estimates.

We estimated that 2.1% of all fishing boat trips were strictly for fishing on Lake Macatawa. Therefore, out of the total 64,660 boat angler days estimated for the Holland area, 1,320 are attributable to fishing on Lake Macatawa.

Of all anglers interviewed, 48% had caught fish on the day questioned, and the aggregate catch for all species on days anglers were interviewed was 1.83 fish per angler day. Chinook salmon and lake trout comprised together 62% of the catch.

Table 17. Boat anglers' average daily expenditures made at home, en route, and in the Holland area.

Type of expenditure	Home	En route	County
Major fishing equip.	--	--	.05
Tackle-small gear	--	--	1.58 (1.10)
Licenses	--	--	.31 (.92)
Boat rentals	--	--	.32 (1.46)
Launch fees	--	--	.16 (.06)
Boat gas and oil	.29 (1.31)	.20 (.42)	4.73 (2.44)
Camping	--	--	.06 (.25)
Lodging	--	--	.06 (.26)
Restaurants	--	--	.57 (.32)
Groceries	.09 (.29)	.24 (1.06)	.95 (.54)
Beer	.03 (.13)	--	.63 (.22)
Vehicle gas	1.95 (2.54)	.18 (.83)	1.40 (3.43)
Miscellaneous	--	--	2.81 (.04)
Family spending	--	--	.94 (4.25)
Total	1.81	.62	13.58
Non-resident total	(4.28)	(2.31)	(14.75)

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

64,660 angler days X $13.58 per angler day = $878,083

The estimated gross expenditures of Holland non-resident boat anglers in Ottawa County were:

14,303 angler days X $14.75 per angler day = $210,969

Table 18. Holland boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Need another marina on Lake Macatawa.	1.4%
2. Need boat rentals.	1.0%

Ninety-seven percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the Indian gillnetting.	9.6
2. Need more ramps at the DNR launch.	9.2%
3. Do not charge to launch boats.	8.8%
4. Plant more salmon.	6.9%
5. Need more dockage at the DNR launch.	3.2%
6. Need a municipal marina.	2.3%

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

Table 18 continued:

III. General responses.

Response	% of interviewed anglers
1. The fishing is poor.	1.5%
2. The fishing is good.	1.0%

Grand Haven

Grand Haven is Ottawa County's real drawing card for Great Lakes offshore fishing. The Grand River receives one of the largest runs of anadromous salmonids in Michigan, and the concentrations of fish off the mouth of the river provides some of the state's best fishing. Grand Haven has a reputation of success throughout the Great Lakes region, and with the recent completion of the fish ladder projects and the increased plants of fish to bring sufficient numbers of fish up the Grand River into the state's capitol, Grand Haven's reputation as a fish-producing area has a secure future. The area's reputation was evident in our sample, in that over 84% of the interviewed boat anglers came from outside the county.

Of all boat anglers interviewed, 40% had caught fish on the day questioned. The aggregate catch for all species was 1.25 fish per angler day, with salmonids making up the entire catch.

Table 19. Boat anglers' average daily expenditures made at home, en route, and in the Grand Haven area.

Type of expenditure	Home	En route	County
Tackle-small gear	--	--	2.29 (1.59)
Slip fees - transient	--	--	.53 (.64)
Launch fees	--	--	.38 (.31)
Boat gas and oil	--	--	4.42 (4.31)
Camping	--	--	.52 (.38)
Restaurants	--	--	2.13 (2.54)
Groceries	.80 (.95)	--	2.52 (2.71)
Beer	.56 (.67)	--	1.15 (1.37)
Vehicle gas	2.33 (2.78)	2.33 (2.78)	1.41 (1.59)
Miscellaneous	--	--	4.40 (5.24)
Family spending	--	--	1.09 (1.30)
Total	3.69	2.33	20.84
Non-resident total	(4.40)	(2.78)	(21.98)

The total estimated gross expenditures of all Grand Haven boat anglers were:

90,014 angler days X $20.84 per day = $1,875,892

The estimated gross expenditures of Grand Haven non-resident boat anglers in Ottawa County were:

75,612 angler days X $21.98 per day = $1,661,952

Table 20. Grand Haven boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Tackle stores need to open earlier.	2.3%

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

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the Indian gillnetting.	72.0%
2. Clean the restrooms at the municipal launch.	32.0%
3. Get rid of the water use tax.	8.0%

Twenty percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

III. General responses.

Response	% of interviewed anglers
1. Likes the Grand Haven area.	22.3%
2. This area has good fishing.	15.6%
3. The fishing is poor.	11.7%
4. Enjoyed the musical fountain.	4.0%

Muskegon

Muskegon provides many opportunities for the boat angler. Besides the salmonid fishing on Lake Michigan, anglers can catch bass, pike, perch, and walleye in addition to trout and salmon on Muskegon Lake. Muskegon has more public launch sites than any of the other sampling areas, and the fishing resources are amply utilized by the residents of the city. The impact of resident use is obvious, when according to our use estimates, Muskegon had almost as much total boat use as Grand Haven, but only one-sixth as much non-resident use. That in large measure explains why the economic impacts are not as dramatic as they are in the Grand Haven area.

Of all the boat anglers interviewed, 65% had caught fish on the day questioned. Their aggregate catch rate of all species was 2.5 fish per angler day. Anglers caught an average of 1.2 salmonids per angler day, while an average of 1.3 warm-water species were caught per angler day.

Table 21. Boat anglers' average daily expenditures made at home, en route, and in the Muskegon area.

Type of expenditure	Home	En route	County
Major fishing equip.	--	--	.50 (.49)
Tackle-small gear	.02 (.09)	--	.80 (1.02)
Licenses	--	--	.16 (.83)
Slip fees	--	--	.33 (.02)
Launch fees	--	--	.33 (.44)
Boat gas and oil	.10 (.65)	--	3.27 (2.98)
Camping	--	.01 (.06)	.07 (.41)
Lodging	--	--	.12 (.73)
Restaurants	--	.06 (.24)	.22 (.86)
Groceries	.02 (.14)	.02 (.11)	.64 (.04)
Beer	.02 (.14)	.01 (.08)	.54 (.06)
Vehicle gas	.39 (1.99)	.05 (.28)	2.40 (4.38)
Miscellaneous	--	--	.06 (.05)
Family spending	--	.03 (.19)	.01 (.04)
Total	.55	.17	8.54
Non-resident total	(3.00)	(.95)	(12.31)

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

83,008 angler days X $8.54 per angler day = $708,888

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

13,281 angler days X $12.31 per angler day = $163,490

Table 22. Muskegon boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Most package stores in town are dirty.	0.8%
2. Businesses do not cater to fishermen.	0.8%
3. Some restaurants need to open earlier.	0.8%

Ninety-seven percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Need more launch sites on Muskegon Lake.	7.3%
2. Stop the Indian gillnetting.	5.1%
3. Do not charge to launch boats.	4.0%
4. Need longer docks at Hartshorn boat launch.	3.3%
5. Need more parking area at Hartshorn lot.	2.2%
6. Need wider ramps at Hartshorn.	2.2%

Table 22 continued:

Seventy-four percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

III. General responses.

Response	% of interviewed anglers
1. The area has good fishing.	1.8%

Whitehall-Montague

Like anglers in Muskegon, anglers fishing in the Whitehall-Montague area are blessed with many fishing resources. White Lake produces fine catches of perch, bass, pike, and walleyes, besides good catches of trout and salmon. One major concern is that access is limited; all the existing boat launches are concentrated at the eastern end of White Lake. Offshore salmonid anglers were particularly vociferous about the inconvenience of having to motor the length of White Lake to fish on Lake Michigan. They strongly suggested the need for adequate boat launching facilities on the western end of the lake.

Thirty-four percent of boat anglers fishing in the Whitehall-Montague area were successful, which is below all the other sample areas. However, those that did catch fish, caught more fish than anglers in the other areas. The aggregate catch rate for all species was 3.1 fish per angler day. Of all the interviewed anglers who caught chinook salmon, the average catch rate was 2.5 fish per angler day.

Table 23. Boat anglers' average daily expenditures made at home, en route, and in the Whitehall-Montague area.

Type of expenditure	Home	En route	County
Major fishing equip.	.14 (.50)	--	.30 (.19)
Tackle-small gear	.01 (.05)	--	.86 (1.50)
Licenses	--	--	.24 (.47)
Slip fees	--	--	.22 (.07)
Launch fees	--	--	.58 (1.01)
Boat gas and oil	.61 (2.21)	--	3.50 (2.41)
Camping	--	--	.08 (.29)
Lodging	--	--	.15 (.54)
Restaurants	--	--	.58 (1.73)
Groceries	--	--	1.39 (.81)
Beer	.01 (.02)	--	.88 (.70)
Vehicle gas	1.38 (5.04)	.03 (.10)	3.14 (3.99)
Miscellaneous	.02 (.06)	--	.46 (.94)
Family spending	--	--	.10 (.03)
Total	2.16	.03	10.98
Non-resident total	(7.89)	(.10)	(13.84)

The total estimated gross expenditures of all Whitehall-Montague boat anglers in Muskegon County were:

47,152 angler days X $10.98 per angler day = $517,729

The estimated gross expenditures of Whitehall-Montague non-resident boat anglers were:

12,944 angler days X $13.84 per angler day = $179,145

Table 24. Whitehall-Montague boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Need better motels.	1.0%
2. Need a place to gas boat on the water.	1.0%

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

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Dredge the boat launch.	17.6%
2. Need more campgrounds in area.	7.5%
3. Clean the restrooms at the boat launch.	6.5%
4. Allow camping at the launch site.	4.9%
5. Need fish-cleaning facilities.	3.9%
6. Need another dock at the boat launch.	2.6%
7. Need potable water at the boat launch.	2.3%
8. Plant more steelhead.	2.0%

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

Table 24 continued:

III. General responses.

Response	% of interviewed anglers
1. This area has good fishing.	11.4%
2. The fishing was poor.	6.2%

GRAND HAVEN BAYOU BOAT FISHERY

The Grand River and its bayous in the Grand Haven area offer a very productive warm-water fishery from spring through the fall. Anglers make excellent catches of bluegills, crappie, catfish, largemouth bass, and northern pike. There are a number of public and private access sites on the river and the bayous, and two of the private launches sponsor bass tournaments through the summer (Felix's and Grand Valley). The bayous are well known for their good fishing, and draw a large number of non-resident anglers; our surveys showed more than 70% of bayou boat use was by out-of-county people.

The majority of the fishing effort on the bayous is directed at largemouth bass. Many bass clubs come to the area to participate in the tournaments, and we believe it is primarily their involvement which gives strong support to the economic potential of the bayou fishery.

Eighty-four percent of the interviewed bayou boat anglers caught fish on the day questioned. The aggregate catch rate for those successful anglers was 3.7 fish per day. Successful bass anglers averaged 2.4 bass per day.

Table 25. Grand Haven bayou boat anglers' average daily expenditures made at home, en route, and in Ottawa County.

Type of expenditure	Home	En route	County
Major fishing equip.	1.61 (2.22)	--	1.47 (1.02)
Tackle-small gear	--	.08 (.11)	4.13 (3.29)
Slip fees - annual	--	--	.02 (.02)
Launch fees	--	--	1.45 (2.00)
Boat gas and oil	.08 (.11)	--	3.44 (3.63)
Camping	--	--	.59 (.82)
Lodging	--	--	2.12 (2.92)
Restaurants	--	--	2.91 (4.01)
Groceries	--	--	1.36 (1.38)
Beer	--	--	1.66 (1.93)
Vehicle gas	.85 (1.17)	--	2.74 (3.24)
Miscellaneous	--	--	1.09 (.93)
Family spending	--	--	.57 (.78)
Total	.93	.08	23.55
Non-resident total	(3.50)	(.11)	(25.97)

The total estimated gross expenditures of all Grand Haven bayou boat anglers in Ottawa County were:

27,889 angler days X $23.55 per day = $656,786

The estimated gross expenditures of Grand Haven non-resident bayou boat anglers in Ottawa County:

20,242 angler days X $25.97 per day = $525,685

Table 26. Grand Haven bayou boat angler comments.

I. Responses about the local businesses.

Responses	% of interviewed anglers
1. Need better bathrooms at Stearn's bayou.	4.8%
2. Need more good restaurants along the Grand River.	3.2%
3. Businesses should be more hospitable to bass fishermen.	3.2%

Ninety-one percent of all the anglers interviewed felt the local businesses provided adequate services and facilities.

II. Responses about government agencies.

Responses	% of interviewed anglers
1. Stop the landfill at Riverside Park.	21.0%
2. Plant more largemouth bass.	21.0%
3. Enforce the NO WAKE law.	8.1%
4. Get rid of the shad.	8.1%
5. Stop the Indian gillnetting.	6.5%

Thirty-one percent of all the anglers interviewed felt the government agencies involved provided adequate services and facilities.

Table 26 continued:

III. General responses.

Responses	% of interviewed anglers
1. People do not understand bass clubs.	3.2%

CHARTER FISHING

Charter captains in all four sampling areas were asked to help in the gathering of information for this study. Although assurances of cooperation were given, only captains in Grand Haven came through with an honest effort. Supposedly, the captains in the other sampling areas will provide us with estimates of the total number of clients they booked this past year, and should we receive that information, we will revise our estimates using Grand Haven as the norm.

Grand Haven's charter boat fleet has conducted surveys of its clientele for the past two fishing seasons. Charter captains used our questionnaire to ask their clients where they were from, how many days they planned to stay in the area, what percentage of their trip was for the purpose of fishing, and what their local expenditures were for a variety of goods and services.

In addition to interviewing their clients, the charter captains were asked to estimate the total number of clients they booked for each of the past two seasons. Grand Haven's total for the 1981 season was 3,813 clients based on 12 boats' responses, and for the 1982 season the total was 4,095 clients based on 15

boats' responses. Grand Haven charter captains made 72 interviews during the 1981 season and 58 interviews during the 1982 season.

We suggested the captains do a separate questionnaire for each client in a party during the 1981 season. However, it was found that the captains were reluctant to interview each client, and in most cases the captains did one questionnaire for the whole party or else interviewed the person who had spent the most money. Although we were reluctant to do an interview per party because it would reduce the statistical variance of our sample, we did not want to lose what cooperation we had with the captains. Therefore, we agreed to a party interview for the 1982 season, and assigned the average of party expenditures to each angler in the party for both the 1981 and 1982 samples. Our 1981 sample size was 180 anglers and the 1982 sample size was 319 anglers, the 1982 sample being greater because of some large corporate charters.

Table 27 itemizes the average expenditures of Grand Haven charter clients for a number of goods and services for both seasons. The percentage in parentheses after each estimated expenditure is the statistical confidence interval.

Table 27. Grand Haven non-resident charter anglers' average daily expenditures in Ottawa County.

Category	1981		1982	
Charter fee	27.90	(12.4%)	31.43	(5.1%)
Licenses	2.15	(20.0%)	1.28	(20.6%)
Lodging	5.40	(23.3%)	6.65	(12.2%)
Restaurants	6.24	(16.3%)	5.35	(7.6%)
Groceries	2.33	(30.6%)	1.42	(15.9%)
Beer and Liqour	--	--	1.39	(15.6%)
Entertainment	1.63	(25.3%)	.74	(25.6%)
Vehicle gas	2.88	(25.6%)	2.16	(10.8%)
Family shopping	2.75	(53.0%)	.53	(33.8%)
Miscellaneous	.68	(57.5%)	.64	(23.2%)
Total	52.13	(10.4%)	51.59	(4.2%)
Average length of stay	2.167 days		1.953 days	

Gross expenditures calculations

1981: $\frac{\$52.13}{\text{day}} \times \frac{2.167 \text{ days}}{\text{client}} \times 3{,}813 \text{ clients} = \$430{,}738$

$112.97 / client

1982: $\frac{\$51.59}{\text{day}} \times \frac{1.953 \text{ days}}{\text{client}} \times 4{,}095 \text{ clients} = \$412{,}593$

$100.76 / client

It is interesting that the total average daily expenditures were practically identical for both seasons. However, we are more confident of the 1982 estimates because of the larger sample size, which is reflected in the lower confidence intervals.

CONCLUSIONS

Tables 28 and 29 summarize the total use and expenditures for Ottawa and Muskegon counties. A real distinction between the two counties is evident from the tables. The degree to which a county is impacted by anglers' expenditures is dependent upon its attraction to visitors. Even though the total use in Muskegon County is more than half that in Ottawa County, because so few people come there to fish, its total expenditures influx is one-third that of Ottawa County. The bottom line is, people who stay longer, spend more.

Table 28. Ottawa County total and non-resident use and expenditure summary.

	ALL ANGLERS		NON-RESIDENT	
Fishery	Use	$	Use	$
Holland ice	7,243	23,178	630	1,103
Holland pier	17,574	121,964	9,015	76,718
Holland boat	64,660	878,083	14,303	210,969
Holland total	89,477	1,023,225	23,948	288,790
G. Haven ice	11,256	31,067	2,641	4,094
G. Haven pier	31,646	279,751	19,432	196,652
G. Haven boat	90,014	1,875,892	75,612	1,661,952
G. Haven bayou	27,889	656,786	20,242	525,685
G. Haven charter	4,056	412,593	4,056	412,685
G. Haven total	168,726	3,256,089	125,848	2,800,616
Ottawa total	258,203	4,279,314	149,796	3,081,406

Table 29. Muskegon County total and non-resident use and expenditure summary.

	ALL ANGLERS		NON-RESIDENT	
Fishery	Use	$	Use	$
Muskegon ice	14,781	81,887	3,425	19,660
Muskegon pier	9,015	56,434	634	5,408
Muskegon boat	83,008	708,888	13,281	163,490
Muskegon total	106,804	847,209	17,340	188,558
Whitehall ice	4,827	35,189	1,123	6,513
Whitehall pier	6,812	48,161	736	2,388
Whitehall boat	47,152	517,729	12,944	179,145
Whitehall total	58,791	601,079	14,853	188,046
Muskegon total	165,595	1,448,288	32,193	376,604

The economic impact of angling is not limited to the gross 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 gross income the counties receive from anglers' expenditures will leave the area as payment for imported goods and services.

Since we were not able to empirically estimate multipliers for Ottawa and Muskegon counties, we will use a multiplier from the literature. Kalter and Lord (1968) estimated a multiplier of 1.5 for a rural area in Wisconsin. Because Ottawa and Muskegon counties are not strictly rural, and because they resemble in their basic industry mix the situation in Manistee county, we will use a multiplier of 2.0, which is conservatively less than all the multipliers estimated by Diamond and Chappelle (1981) for the Manistee economy. In Table 30 we first apply the multiplier of 2.0 to non-resident anglers' gross expenditures to give us total direct and indirect gross sales in the counties. Gross sales are then adjusted by an income component to estimate what the direct net income is to each county. From the literature (Pearse and Laub, 1969; Kalter and Lord, 1968) a value of 35%, based on a range (28%-51%) of income componenet values, is used.

Table 30. Adjusted gross expenditures and direct net income from non-resident angler expenditures in Ottawa and Muskegon counties.

Ottawa County

Gross Expenditures		Multiplier		Adjusted Gross
$3,089,406	X	2.00	=	$6,178,812

Adjusted Gross		Income Component		Net Income
$6,178,812	X	0.35	=	$2,162,584

Muskegon County

Gross Expenditures		Multiplier		Adjusted Gross
$376,604	X	2.00	=	$753,208

Adjusted Gross		Income Component		Net Income
$753,208	X	0.35	=	$263,621

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APPENDIX A

Survey Questionnaires

ANGLER QUESTIONNAIRE

Keypunch number

Number of anglers skipped, if shore, pier or ice fishing _____
If first interview, write "start"; if last, note number of anglers left. _____

1. City _____ 1
2. Type of fishing _____ 2
3. Interview number (interviewer, do not fill in) 3 4 5
4. Day of week (weekday = 1, weekend and holiday = 2) * 6
5. Month / Day / Year * 7 8 / 9 10 / 11 12
6. How many fish altogether have you caught today? * 13 14
   Number of each species:

   Coho * 15 Chinook * 16 Lake trout * 17 Steelhead * 18 Brown trout * 19

   LM Bass * 20 SM Bass * 21 N. Pike * 22 Musky * 23 Walleye * 24

   Perch * 25 26 Panfish * 27 28 Other _____ * 29 30
7. How many hours do you plan on fishing today?" (hours in a 24-hour period, midnight to midnight) * 31 32
8. Where are you from? County _____ 33 34 35 36
   State _____
9. How many miles will you drive round trip, including side trips, if any? * 37 38 39 40
10. Percentage-wise, how much was the purpose of this trip for fishing here? * 41 42 43
11. If angler is not here just to fish, "What are up to two other major purposes for this trip of yours?" _____ 44 45 46 47
12. If you could split the purpose of your fishing between the "sport of it" and for the food, what % would you attribute to each?

    Sport * 48 49 50 Food * 51 52 53
13. How did you learn about the fishing opportunities here? 54 55
14. Have you fished here before? (yes = 1, no = blank) * 56
15. Will you fish here again? (maybe = 2) * 57
16. How many times in a year do you take a trip to fish here? * 58 59
17. In what season of the year do you do most of your fishing? 60
18. What species of fish are you particularly trying to catch today? 61 62

19. If interveiwing a boat group, "How long is the boat?" * 63 64

20. If interveiwing a boat group, "How many in the party fished today?" * 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. If interveiwing a boat group, "What body(ies) of water did you just fish on?"

_____ 71

23a. How many days are you planning to be on this trip? * 72 73

EXPENDITURES (For this trip)

	Home			En route			Here		
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 - Transient	* 37	38	39	* 40	41	42	* 43	44	45
- Yearly	* 46	47	48	* 49	50	51	* 52	53	54
F. Launching fees	* 55	56	57	* 58	59	60	* 61	62	63
G. Boat gas, oil, etc.	* 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 (do not include beer)	* 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 (entertainment, cigs, sundries, etc.) * 55 56 57 * 58 59 60 * 61 62 63

O. Family spending (clothes, etc.) * 64 65 66 * 67 68 69 * 70 71 72

a. Are you aware there is an artificial reef just south of the Muskegon pier? * 73

b. If so, how many times have you fished there? * 74 75

c. On a scale of 1 to 5, 1 being poor, 3 being average, and 5 being great, how would you rate the fishing on the reef? * 76

d. If you fished the reef on this trip, what percentage of the purpose of your trip was to fish the reef? * 74 75 76 (on card 1

24. Is this area more or less expensive than comparable trips to other areas? (more = 1, less = 2, same = 3) * 1

25. Do you think the services and facilities provided by the businesses of this community are adequate for your needs as an angler and your family? (yes = 1, no = blank) * 2

26. Do you have any suggestions for improvement?

1. _____ 3 4 5 6

2. _____ 7 8 9 10

3. _____ 11 12

4. _____

5. _____

27. Do you think the services and facilities provided by the government agencies involved in this area are adequate for your needs as an angler and your family? (yes = 1, no = blank) * 13

28. Do you have any suggestions for improvement?

1. _____ 14 15 16 17

2. _____ 18 19 20 21

3. _____

4. _____ 22 23

5. _____

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

_____

30. Is there anything you particularly liked or didn't like about your fishing experience here? What were your "best" and "worse" experiences, if any?

1. _____ 28 29 30 31

2. _____

3. _____ 32 33 34 35

4. _____

5. _____ 36 37

Married? ... _____ 49

31. If so, on fishing trips to here, what % of the time does your spouse accompany you? 38 39 40

32. When spouse or family are here with you, what are they doing while you are fishing? _____ 41 42 43 44

_____

33. Age _____ 45 46

34. Sex _____ 47 (male = 1, female = 2)

35. To the nearest $5000.00, what is your immediate family's gross annual income? 48

$ _____

CHARTER ANGLER QUESTIONNAIRE

Month Day Year If this interveiw is for a party, number in party.

1 2 3 4 5 6 7 8

1. What state and county are you from?
State_____ County_____ 9 10 11 12

2. How many miles is it from your home to here? 13 14 15 16

3. How many days do you plan on staying in this area? 17 18

4. Percentage-wise, how much is the purpose of your trip for fishing in this area? 19 20 21

5. How many fish did you/the party catch today? 22 23

EXPENDITURES FOR THIS TRIP AND IN THIS AREA

A. Charter fee and tips. 24 25 26 27

B. Fishing licenses. 28 29 30 31

C. Camping fees. 32 33 34 35

D. Lodging. 36 37 38 39

E. Restaurants. 40 41 42 43

F. Grocery food and snacks. 44 45 46 47

G Beer, liquor, and bar. 48 49 50 51

H. Vehicle gas, oil, and etc. 52 53 54 55

I. Entertainment. 56 57 58 59

J. Fishing equipment 60 61 62 63

K. Family shopping. 64 65 66 67

L. Miscellaneous. 68 69 70 71

6. Port where interview conducted?

_____ 73 74 75

7. Interview number (do not fill in) 77 77 79 80

Muskegon-Ottawa Sport Fishing Economic Impact Business Survey

The counties of Muskegon and Ottawa in conjunction with Michigan State University have been conducting a year-long investigation of the economic impacts of sport fishing in this area. Teams of interviewers have been making personal surveys of anglers, questioning them about their fishing trip expenditures and the perceptions they have of their fishing experience in the two counties. From the angler interviews MSU researchers expect to estimate the total gross expenditures of Great Lakes sport fishermen in this area for various categories of purchases.

An important aspect of the analysis is to estimate the economic impacts of the subsequent respending of angler dollars by businesses in Muskegon and Ottawa counties. While anglers' initial purchases generate income and employment for the local economy, the local goods and services businesses purchase with angler dollars translates into additional income and employment. Depending on the type of business, the secondary income and employment effects oftentimes exceed the impacts associated with the initial expenditures. Therefore, to ignore the secondary effects would be to grossly underestimate the economic impacts of sport fishing in the two counties.

If you believe your business is never patronized by anglers, please *do not* complete or mail in this questionnaire. However, if anglers represent all or part of your clientele, your cooperation in fully answering the following questions will help give Muskegon and Ottawa counties the best available information on the importance of Great Lakes sport fishing to the area's economy. At no time will the confidentiality of an individual be compromised. A copy of all the findings will be available to anyone interested through the Muskegon and Ottawa Cooperative Extension offices after the first of next year.

1. Circle the county your business is in: MUSKEGON OTTAWA

   If your business is in neither, please disregard this questionnaire. If you have business operations in both counties, please circle the county where the business offices are to which this questionnaire was sent.

   The following questions should be answered in regard to your business operations which occur solely within the above circled county.

2. What were your total sales of all your products in 1981 from your business operations? $ _____

3. Please list your major products and/or services and what percentage each was of total sales in 1981.

Product or Service	Percentage of Total Sales
1. _____	_____%
2. _____	_____%
3. _____	_____%
4. _____	_____%
5. _____	_____%

4. What was your total average monthly employment during 1981? Please estimate in terms of "full-time equivalents", e.g., two half-time employees would equal one full-time employee. _____ employees.

5. What percentage of your total sales would you attribute to anglers' purchases? _____%

6. What were your purchases and expenditures from the industry groups listed below?

   Please write your answers as a percentage of total sales from your business operations. If your purchases are from wholesalers or retailers who bought the products from others, please write the percentages of total sales under the industry group that acutally made the product. Please put an "X" next to purchases which passed through a wholesaler or retailer. Purchases from a wholesaler or retailer which cannot be traced to an industry of origin should be placed under group 21, Wholesale and Retail Trade. In addition, it is important to identify the portion of your purchases from industry groups in your county. If you do not provide an estimate, we will assume all your purchases from that group are imported into the county. The only purchases we would have you exclude are capital expenditures, therefore, the percentages need not add up to 100.

EXAMPLE

Industry Group	Purchases as a Percent of Total Sales	Percent from County Industries
1. Food and Kindred Products	X54%	76%
2. Transportation and Communication	10%	90%

In this example, your business spends 54% of its total sales on Food and Kindred Products, of which 76% is from producers within the county. The "X" indicates these products are mainly bought from a wholesaler. Ten percent of your total sales went for transportation and communication purchases, of which 90% were supplied by industries in your county.

Group	Purchases as a Percentage of Total Sales	Percent from County Industries
1. Agricultural Products and Services	____%	____%
2. Construction	____%	____%
3. Food and Kindred Products	____%	____%
4. Textiles and Apparel	____%	____%
5. Veneer and Plywood	____%	____%
6. Other Lumber and Wood Products	____%	____%
7. Paperboard Containers and Products	____%	____%
8. Converted Paper and Paper Products	____%	____%
9. Other Paper Products	____%	____%
10. Printing, Publishing and Allied Industries	____%	____%
11. Chemicals and Allied Products (Plastics, Synthetics, Drugs, Organics)	____%	____%
12. Petroleum Refined Products	____%	____%
13. Rubber and Leather Products	____%	____%
14. Stone, Clay, Glass & Concrete	____%	____%
15. Fabricated Metal Products	____%	____%
16. Primary Raw Metal Products	____%	____%
17. Miscellaneous Manufacturing Products	____%	____%
18. Transportation and Communication	____%,	____%
19. Electrical and Gas Utilities	____%	____%
20. Water and Sanitary Service	____%	____%
21. Wholesale and Retail Trade	____%	____%
22. Finance, Insurance and Real Estate	____%	____%
23. Other Services (Please Specify: _____)	____%	____%
24. Local Government, including taxes	____%	____%
25. Households (labor costs, including fringe benefits)	____%	____%
26. Other Payments (Rent and Profit)	____%	____%

We wish to thank you for completing this questionnaire. Your cooperation has significantly helped in providing a reliable data base for the analysis of the economic impacts of sport fishing in Muskegon and Ottawa counties. Please fold and staple the questionnaire so the return address is showing and mail it at your earliest convenience.

21-2665

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BUSINESS REPLY MAIL
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Attn: Scott W. Jordan - Sr. Research Assistant
Department of Fisheries and Wildlife
Natural Resources Building
Michigan State University
East Lansing, MI 48824