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ERIE FISHERY DEVELOPMENT PROGRAM

Prepared for

Erie-Western Pennsylvania Port Authority

Funded and Coordinated Through

Department of Environmental Resources,
Office of Resources Management, and
Coastal Zone Management Office

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FOREWORD

The report presents the recommendations of Hammer, Siler, George Associates, in association with marine biologist Dr. Andrew M. White and fishing promotion specialist and writer James Bashline, for an action strategy to expand the role of fishing in the local Erie economy. The report was completed for the Erie-Western Pennsylvania Port Authority and was funded and coordinated through the Commonwealth of Pennsylvania, Department of Environmental Resources, Office of Resources Management, Division of Coastal Zone Management. The preparation of the strategy recommendations is the next step in implementing one of the important recommendations of the previously completed Erie Bayfront Development Strategy.

The Lake Erie water resource has been a foundation of the Erie economy over the years and it remains so today. As a port of access to the navigable portion of the Great Lakes waterway system, Erie grew as a trading center, a flour milling center, and a location for machinery manufacture. First, the St. Lawrence Seaway and then the shift in transportation emphasis to rail and then to truck weakened this support function but the port remains critical to the present and future economy.

The lakefront is at least equally important as an amenity and a fishing and total recreation resource. Experience across the country with all types of development and all types of amenities clearly establishes that water bodies are not only the dominant development factor in determining the relative competitive attraction of various parts of a community, but also create new markets by attracting existing residents and businesses to relocate in new facilities in order to take advantage of the water amenity; and by attracting businesses choosing among several similar urban areas to the one providing the most high-amenity setting.

This consultant assignment addresses yet another of the major supports which Lake Erie provides to the Erie economy: an abundant fishery with the variety of species and harvest potential which is a major attraction to the regional fisherman market. This fishery is important to the economy at present and it is a major conclusion of our analysis that it can be even more important in the future.

The fishing history of Erie has been one of changing species resulting from deterioration of environmental support factors, the very substantial progress in correcting these negative environmental factors, the introduction of popular new species and the preservation and enhancement of existing surviving species. Most dramatic on the negative side was the disappearance over the years of the blue pike. This species has been more than replaced in recent years by the stocking of the salmonids (trout and salmon) and by the preservation and enhancement through regulation, stocking and natural production of the yellow perch and other panfish, walleye and bass. Erie now has one of the strongest year-round fisheries available in the central Great Lakes Region. This resource is important to the visitor industry and commercial fishing industry now and can be even more important in the future.

The visitor component of total Erie economy is presently anchored by the Presque Isle State Park, the most highly visited in the state system. This park provides facilities for boat and shore fishing and more importantly attracts thousands of visitors for sun and fun who can be attracted to stay on and make an additional day's contribution to the economy if a well promoted and orchestrated fishing program is in place.

Access from the park to downtown, the regional highway system and other parts of the bayfront is not good and this seriously retards the overall fishing promotion effort as well as the total impact of park attendance on the local economy. Early construction of the Bayfront Access Road is essential to establish this access link and make the water resource convenient for fishing and other purposes.

This access need cannot be overstated. The Erie bayfront is at present largely inaccessible. While other cities are capitalizing on waterfronts with far less esthetic and use capacity, Erie is walled from this potential by the physical inability to reach the waters edge and therefore to share in the entertainment and quality of life experience as well as to reap the benefits of the development of such a resource to the local economic lease. Early construction of the road is extremely important to full development of sport fishing as a provider of jobs, tax revenues and overall economic vitality; thus, it is a key to the development strategy proposed here.

In presenting the recommendations for fishing development actions each of the components of a successful visitor and commercial fishing industry in Erie were analyzed. In Section I, the existing sport fishing market was analyzed in terms of current fishing activity, in

terms of the geographic areas from which Erie presently draws fishermen and the share of all fishing trips from these areas attracted by Erie.

In Section II the focus was describing and measuring the impact of sport fishing on the economy, particularly as represented by fishing related expenditures made by both resident and non-resident fishermen. Section III presents a detailed analysis of the relative quality of the sport fishing experience in Erie in terms of: the fish populations and stocking and natural spawning improvement programs; promotional programs; boat and shore access opportunities; fishing related business services and other competitive factors. A recommended action strategy is presented and total and annual costs are estimated.

In Section IV forecasts are made of the increased fishing trips and fishermen expenditures which will result from the successful implementation of the various components of the sport fishing development program. These are among the important benefits. Section V presents our analysis of commercial fishing activity in Erie and makes recommendations for future actions. Appendices A and B provide more detailed data on stocking potentials and costs and present fishing patterns.

Overview of Methodology

Forecasts of potential fishing trips and economic impacts are the basis of the recommended development program. The methodology used to analyze and forecast fishing trips followed these steps:

1. Current fishing trips by origin were related to the number of licensed fishermen residing in the origin areas. This penetration rate provided a base for forecast potential.
2. The average economic impact of fishing trips was estimated by identifying the total impact (through interviews and national industry statistics) and allocating the impact by type of trip (boat/non-boat and local resident/non-local).
3. Erie's current competitive position was evaluated by comparing it with other major fishing destinations as identified by outdoor writers of Pittsburgh area newspapers and other industry experts.
4. Evaluation of Erie's current competitive position and penetration rates (Step 1) provided the basis for judgements on the extent to which improvements in Erie's competitive position

can generate more trips. Cost estimates for proposed actions compared with expected increases in trips helped to set priorities among possible actions.

Methodology

The logic behind the methodology is that, while precise measurement of cause and effect is not possible because of a limited relevant data base, informed judgments are possible as to the relative impact of specific improvements and programs on the number of resident and non-resident fishermen who will use Erie's waters and benefit the economy. However, because the visitor generation factors are judgmental, it would be misleading to attempt to match costs and impacts for each individual action. Combinations of actions and the various types of actions can be meaningfully rated, and this was done in the report.

This Report is Dedicated

Throughout the recent development of sport fishing in Erie, important and often courageous leadership has been provided by Richard E. (Bud) Winschel of the SONS of Lake Erie. Bud was very proud of Erie as a place to live and committed in everything he did to making it a better place. His dedication to improving sport fishing was a part of that commitment.

He was a great help in our work on this assignment and we dedicate this report in his memory.

Credits. The staffs of the Pennsylvania Fish Commission, the Erie-Western Pennsylvania Port Authority, the Division of Coastal Zone Management and the Erie Conference, the members of the SONS of Erie, the Downriggers and other local fishermen's groups have all made important inputs to our work. The findings and recommendations, of course, are those of Vernon George, Tom Witt, Dr. Andrew White, James Bashline, and the rest of the Hammer, Siler, George consultant team.

HAMMER, SILER, GEORGE ASSOCIATES
Silver Spring, Maryland
July 1983

TABLE OF CONTENTS

	<u>Page</u>
FOREWORD	i
EXECUTIVE SUMMARY	v
Section I. <u>EVALUATION OF SPORT FISHING MARKET</u>	1
Current Fishing Activity	1
Market Area	3
Market Area Potentials	5
Erie Penetration Rates	6
Forecast Baseline Potential	8
Section II. <u>THE ECONOMIC IMPACT OF SPORT FISHING</u>	13
Fishing-Oriented Expenditures	13
Expenditures by Type of Trip	15
Expenditures by Species Sought	18
Section III. <u>ERIE'S COMPETITIVE POSITION</u>	23
Competitive Fishing Areas	23
Fishing Area Choice Factors	27
Fish Populations	29
Fish Population Overview	29
Walleye	34
Steelhead Trout	37
Smallmouth Bass	37
Other Species	38
Summary of Fishing Quality	39
Fish Population Improvement Potential	40
Stocking Programs	41
Smallmouth Bass	41
Yellow Perch	42
Walleye	42
Coho Salmon	43
Chinook Salmon	44
Steelhead Trout	44
Summary	44
Spawning Area Improvements	45
Artificial Reef Development	48

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Evaluation of Fishing Promotion Efforts	49
General Erie Promotion Activities	50
Response to Information Request	50
Sportsmen's Shows	52
Erie Fishing Tournament	53
Outdoor Writers	54
Recommended Fishing Promotion Activities	54
Evaluation of Boat Access	63
Total Capacity	63
Boat Trips	64
Launch Ramp Facilities	68
Boat Ramp Development Actions	73
Marina Facilities	75
Marina Development Actions	79
Shore Access Evaluation	80
Shore Access Development	86
Fishing Pier Development	87
Shoreline Improvements	88
Business Services: Evaluation and Potential Actions	89
Fishing Guide Services	91
Other Competitive Factors	94
Summary	94
Management For Action	97
Section IV. <u>FORECASTS OF FISHING TRIPS AND EXPENDITURES</u>	101
Sport Fishing Trip Forecasts	105
Moderate Development Program Recap	112
Section V. <u>COMMERCIAL FISHING DEVELOPMENT POTENTIALS</u>	113
Recent Commercial Fishing Activity	115
Economic Impact	117
Historic Trends	119
Proposed Commercial Fishing Development Actions	121
Appendix A. EVALUATION OF FISH STOCKING POTENTIALS AND COSTS	A-1
Appendix B. EVALUATION OF KEY FISH SPECIES BY FISHING MODE AND LOCATION	B-1
Appendix C. SELECTED FISHING-ORIENTED BUSINESSES CONTACTED	C-1
Appendix D. PENNSYLVANIA COUNTY OF RESIDENCE OF ANGLERS WHO FISHED IN PENNSYLVANIA'S LAKE ERIE WATERS, 1981-1982	D-1

TABLE OF TABLES

		<u>Page</u>
Table 1.	ORIGIN OF FISHING TRIPS, ERIE, PENNSYLVANIA, 1981-1982	3
Table 2.	POPULATION AND FISHERMEN, ERIE FISHING TRADE AREA, 1970-1980	5
Table 3.	SHARE OF ALL PRIMARY SUPPORT AREA FISHING TRIPS MADE TO ERIE COUNTY 1981-1982	7
Table 4.	FORECASTS OF POPULATION AND FISHERMEN, ERIE FISHING TRADE AREA, 1983-1990	9
Table 5.	BASELINE FISHING TRIP FORECASTS, ERIE, 1983-1990	10
Table 6.	FISHING-RELATED SALES AND EXPENDITURES, ERIE COUNTY, 1982	14
Table 7.	DISTRIBUTION OF SALES BY TYPE OF TRIP, ERIE COUNTY, 1982	16
Table 8.	ESTIMATED DAILY EXPENDITURES PER PERSON AND GROUP BY TYPE OF TRIP, ERIE COUNTY, 1982	17
Table 9.	FISH SPECIES TARGETED BY SPORTSMEN, ERIE COUNTY RESIDENTS AND NON-RESIDENTS, 1981-1982	19
Table 10.	FISHING TRIPS ATTRIBUTABLE TO FISH SPECIES, LAKE ERIE PENNSYLVANIA, JUNE 1981-1982	20
Table 11.	FISHING-ORIENTED EXPENDITURES ATTRIBUTABLE TO SPECIES, LAKE ERIE, PENNSYLVANIA, 1982	21
Table 12.	SUMMARY OF TRIPS AND EXPENDITURES GENERATED BY MAJOR SPECIES GROUPS, LAKE ERIE, PENNSYLVANIA, 1982	22
Table 13.	PRIMARY COMPETITIVE FISHING AREAS, PITTSBURGH RESIDENTS, 1983	24

TABLE OF TABLES (continued)

	<u>Page</u>
Table 14. ANGLER HOURS AND FISH HARVESTED, PENNSYLVANIA WATERS OF LAKE ERIE, JUNE 1981-MAY 1982	29
Table 15. AVERAGE FISH SIZE AT HARVEST, LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982	31
Table 16. SUMMARY OF ERIE'S COMPETITIVE POSITION OF SPECIES, ERIE PENNSYLVANIA, 1983	39
Table 17. STOCKING PROGRAM REQUIREMENTS AND COSTS, LAKE ERIE, PENNSYLVANIA, 1983	45
Table 18. SPAWNING CHARACTERISTICS SUMMARY, ERIE TARGET SPORT FISHING SPECIES, 1983	46
Table 19. BOAT ACCESS CAPACITY, LAKE ERIE, PENNSYLVANIA, 1982	64
Table 20. DISTRIBUTION OF COMBINED FISHING AND PLEASURE BOAT TRIPS BY SEASON, LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982	65
Table 21. DISTRIBUTION OF BOAT ANGLING TRIPS BY SEASON, LAKE ERIE PENNSYLVANIA, JUNE 1981-MAY 1982	66
Table 22. FISHING SHARE OF TOTAL BOAT USE LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982	67
Table 23. INVENTORY OF BOAT LAUNCH AREA CAPACITY, ERIE COUNTY, 1981-1982	69
Table 24. LAUNCH RAMP CAPACITY AND USE, LAKE ERIE, PENNSYLVANIA, JUNE 1981-1982	71
Table 25. INVENTORY OF MARINAS, ERIE COUNTY, 1981-1982	76
Table 26. MARINA FISHING CAPACITY AND USE, LAKE ERIE, PENNSYLVANIA	78
Table 27. SHORE FISHING TRIP DISTRIBUTION BY SEASON, LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982	81
Table 28. INVENTORY OF SHORE FISHING SITES, CAPACITY AND USE, ERIE COUNTY, 1981-1982	82 83
Table 29. SUMMARY OF POTENTIAL DEVELOPMENT ACTIONS, ERIE, 1983	95 96

TABLES OF TABLES (continued)

	<u>Page</u>
Table 30. FORECASTS FOR WEIGHTING OF IMPROVEMENT PROGRAMS, ERIE, 1983	99
Table 31. FORECASTS PENETRATION RATES, ERIE FISHING MARKET AREAS, 1990	102
Table 32. FISHING TRIP FORECASTS, ERIE, 1983-1990	104
Table 33. MARGINAL AND TOTAL IMPROVEMENTS SCALES, ERIE FISHERIES DEVELOPMENT ACTIONS, 1983-1990	105
Table 34. EXPECTED FISHING-RELATED AND EXPENDITURES, ERIE COUNTY, PENNSYLVANIA, 1990	107
Table 35. MEASURES OF ECONOMIC BENEFIT, FISHERY DEVELOPMENT PROGRAM, ERIE, 1990	108
Table 36. COMMERCIAL FISHING ACTIVITY, ERIE, PENNSYLVANIA, 1981-1982	114
Table 37. COMMERCIAL FISH HARVEST, ERIE, PENNSYLVANIA, 1981-1982	115
Table 38. COMMERCIAL FISH PRODUCTION BY SPECIES, LAKE ERIE, 1910-1980	116
Table 39. FISH HARVEST, LAKE ERIE AND PENNSYLVANIA SHARE	117
Table 40. COARSE FISH PROCESSING EQUIPMENT COSTS, ERIE, 1983	120
Table B-1. SMALLMOUTH BASS HARVEST, LAKE ERIE PENNSYLVANIA, JUNE 1981-MAY 1982	B-2
Table B-2. YELLOW PERCH HARVEST, LAKE ERIE PENNSYLVANIA, JUNE 1981-MAY 1982	B-3
Table B-3. WALLEYE HARVEST, LAKE ERIE PENNSYLVANIA, JUNE 1981-MAY 1982	B-4
Table B-4. COHO SALMON HARVEST, LAKE ERIE, PENNSYLVANIA, JUNE 1981 MAY 1982	B-5

TABLE OF TABLES (continued)

	<u>Page</u>
Table B-5 CHINOOK SALMON HARVEST, LAKE ERIE, PENNSYLVANIA, JUNE 1982-MAY 1982	B-6
Table B-6. STEELHEAD TROUT HARVEST, LAKE ERIE, PENNSYLVANIA JUNE 1981-MAY 1982	B-7
Table B-7. SELECTED GAME FISH HARVESTS, ERIE, PENNSYLVANIA JUNE 1981-MAY 1982	B-8
Table B-8. PANFISH HARVEST, LAKE ERIE, PENNSYLVANIA, JUNE 1981- MAY 1982	B-9
Table D-1. PENNSYLVANIA COUNTY OF RESIDENCE OF ANGLERS WHO FISHED IN PENNSYLVANIA'S LAKE ERIE WATERS, 1981-1982	D-1

EXECUTIVE SUMMARY

A great amount of data was collected and analyzed in detail as a part of the consultant effort to develop a strategy for substantially expanding the sport and commercial fishing sectors of the Erie economy. The body of this report and accompanying appendices present the results of this analysis; and thus require a total time commitment for comprehension which is beyond that available from many decision makers.

This executive summary attempts to meet the needs of those without the time to study the entire draft, and also to provide a "set of notes" for future reference for those who do review it in entirety. Following this logic the recommendations are summarized briefly in the paragraphs which follow.

Erie's fishing market is composed of the Erie County or local market and of residents of all other areas. In 1981-82, the local market comprised 63 percent of Erie's fishing trips. Only five percent of Erie's tourism is attributable to fishing trips. During the 1970s, licensed fishermen increased by 40 percent in Erie as the share of population with fishing licenses increased from 9 to 12 percent. The number of licensed fishermen in the western Pennsylvania portion of the study area increased by 35 percent. Growth of the fishing trip market is forecasted at 45,000 additional trips, to 539,400, from 1983 to 1990. Programs recommended in this study are designed to increase Erie's share of the market and the number of trips it hosts.

Economic Impact

In 1982, fishing-related sales in Erie County reached \$6.7 million, of which \$3.7 million, or 55 percent, was attributed to non-residents. Some 65 percent of total sales were for boat trips while the remainder was for non-boat trips. Daily expenditures range from \$9 to \$185 depending on the size of the group and length of stay. Expenditures also vary by species sought by fishermen. Two-thirds of expenditures are attributable to coho salmon, yellow perch, and panfish.

Erie's Competitive Position

Erie competes for fishermen with lakes under 4,000 acres and close to their homes, larger lakes, and with communities elsewhere along the Great Lakes. Fishermen select their location based on a number of factors:

- o Fish populations.
- o Fishing promotion and information.
- o Shore access to the water.
- o Boat access.
- o Business services.
- o Distance.
- o Environmental amenities.

The principal attribute of Erie's fish population is its wide range of species. The following data summarizes the number of species, their harvest, and the level of effort required to catch each.

ANGLER HOURS AND FISH HARVESTED, PENNSYLVANIA WATERS OF LAKE ERIE, JUNE 1981-MAY 1982

<u>Specie</u>	<u>Effort In Hours</u>	<u>Fish Caught</u>	<u>Harvest</u>	<u>Time Required To Catch One Fish</u>	<u>Time Required To Harvest One Fish</u>
Yellow Perch	329,900	681,200	498,100	0:29	0:40
Walleye	185,400	40,800	37,200	4:33	5:00
Coho Salmon	323,300	44,900	43,200	7:12	7:41
Chinook Salmon	105,600	8,100	7,900	12:59	13:22
Steelhead Trout	112,300	18,000	14,800	6:15	7:35
Smallmouth Bass	119,000	90,600	33,100	1:19	3:35
All Other	<u>223,100</u>	<u>492,100</u>	<u>198,700</u>	N/A	N/A
Total	1,398,600	2,558,300	833,000	0:33	1:41

Notes: N/A is not applicable. The effort and catch figures in this category are not comparable.

The most important local species is yellow perch, averaging 8 to 10 inches long. Walleye, averaging about 17 inches, is particularly plentiful in the Lake and is being restocked in the bay. Because of their large size, 22 to 28 inches, coho and chinook salmon are a highly prized species. Their continued availability depends on stocking. In summary, Erie's competitive position by species is:

SUMMARY OF ERIE'S COMPETITIVE POSITION BY SPECIES,
ERIE, PENNSYLVANIA, 1983

<u>Species</u>	<u>Extent of Fisherman Appeal</u>		<u>Erie Quality Compared To</u>	<u>Preferred Areas(s)</u>
	<u>Local</u>	<u>Non-Local</u>	<u>Nearby Areas</u>	
Yellow Perch	High	Low	Much Better	Canada/Simcoe
Walleye	High	Mid	Similar	Erie West Basin
Coho Salmon	High	High	Much Better	Lake Michigan
Chinook Salmon	High	High	Much Better	Lake Michigan
Steelhead Trout	Mid	Mid	Much Better	None
Smallmouth Bass	Mid	Mid	Slightly Better	None
Other Game Fish	Low	Mid	Same	Various
Other Panfish	Mid	Low	Slightly Better	None

Stocking of non-native species and continued reproduction of native species are required to maintain and enhance Erie's competitive fishing position. The stocking program is estimated to cost over \$4.5 million.

STOCKING PROGRAM REQUIREMENTS AND COST,
LAKE ERIE, PENNSYLVANIA, 1983

	<u>Stocking Required To Double Catch</u>	<u>Additional Fish Caught</u>	<u>Cost Per Caught Fish</u>	<u>Total Cost (000s)</u>
Smallmouth Bass	719,000 Fingerlings	15,800	\$39.00	\$ 611
Yellow Perch	6,400,000 Fingerlings	50,000	\$52.00	\$ 2,600
Walleye	115,000,000 Fry	27,900	\$41.00	\$ 1,150
Coho Salmon	432,000 Fingerlings	43,200	\$ 2.00	\$ 86
Chinook Salmon	790,000 Fingerlings	7,900	\$10.00	\$ 79
Steelhead Trout	74,000 Fingerlings	14,800	\$ 1.25	\$ 19

Presque Isle Bay is not large enough to require an artificial reef; a location one-quarter mile from the shore is preferred. However, the value of an artificial reef in Erie would be minimal because it would not significantly improve yellow perch and walleye fishing.

Current fishery promotion activities include:

1. The inclusion of fishing in general Erie promotional materials and companies.
2. Fishing maps available at the Chamber if needed in response to request for fishing information.
3. Participation of charter boat operations in a variety of sportmen's shows in surrounding areas.
4. A recently initiated fishing tournament.
5. Efforts on the part of the Chamber of Commerce and local fishermen to attract and entertain outdoors writers from regional newspapers.

These promotional efforts have been helpful in reminding residents about the fishing opportunities in Erie. Implementation of the following promotion actions would help increase Erie's share of the fishing market:

- o A special effort should be launched to attract the National Outdoor Writers Association convention to Erie.
- o Erie's fishing promotion program should be located on or near the Public Dock. Staffing costs for a promotion coordinator and an assistant would be about \$45,000 annually. Information center space and operating costs are estimated at \$12,000 annually.
- o An advertising outreach program is recommended to increase Erie's name recognition as a fishing destination. Weekly newspaper ads during the fishing season would cost about \$35,000 annually. Radio advertisements during the same periods would cost from \$8,000 to \$10,000 depending on their length. These advertising campaigns should be conducted in Pittsburgh and Youngstown at a total estimated cost of \$177,000. Lower priority is recommended for advertising campaigns in Buffalo and Cleveland.
- o The promotion program should also include direct mail, trade magazine, brochure distribution, and trade show participation. Direct mail to 50,000 households would cost about \$20,000. A budget of \$10,000 is recommended for trade magazines. A high

priority is for the fisheries development office to initiate brochure production at an annual cost of \$9,000. The annual cost of printing a brochure is \$4,500. The Pittsburgh, Youngstown, Cleveland, Buffalo, and Harrisburg trade shows should be covered each year at an estimated cost of \$9,500.

- o To aid visitors in finding their way to Erie, directional signs should be provided. The fisheries development office should place about 20 signs costing a total of about \$2,000.
- o The Fishing Information Center should coordinate sponsorship of an annual fishing tournament. The tournament should concentrate on principal native species such as perch or walleye, pp. 61-62.

Erie has capacity for 2,711 boats, of which 63 percent is marina slips. There is parking for 927 vehicles at launch ramps and 75 rental boats. Together they represent a maximum capacity of 8,133 person-trips per day. Because of inclement weather, most boating (67 percent) occurs during June, July, and August. For the same reason, 53 percent of angling trips occur during the same period. Of the launch ramp capacity, most is in very good or good condition and 87 percent are public areas.

BOAT LAUNCH AREA QUALITY AND OWNERSHIP

<u>Quality</u>	<u>Public</u>	<u>Private</u>	<u>Total</u>
Very Good	369	0	369
Good	158	0	158
Fair	195	70	265
Poor	<u>85</u>	<u>50</u>	<u>135</u>
Total	807	120	927

Existing boat ramps should be upgraded where needed to insure their safe use. Access to those ramps along existing streets should be improved and signed. A gabion breakwater should be constructed to aid navigation on windy days. These improvements are estimated to cost \$662,000.

Marina facilities are concentrated on the Bayfront where 61 percent of the slips are located. Of the total slips, most are in very good condition. An estimated 68 percent are privately owned and operated.

MARINA SLIP QUALITY AND OWNERSHIP

<u>Quality</u>	<u>Public</u>	<u>Private</u>	<u>Total</u>
Very Good	685	439	1,124
Good	0	379	379
Fair	27	574	601
Poor	<u>0</u>	<u>103</u>	<u>103</u>
Total	712	1,495	2,207

Marina capacity is 37,100 fishing trips, or 34 percent of their total capacity. Additional marina facilities have been programmed over the past five years but remain unbuilt. It is recommended that a 500-slip marina, launch ramps, washhouses, road access, parking, and a travel unit be constructed. Their cost is estimated at \$3.5 million.

Shore fishing is extremely important to Erie's sport-fishing industry. Unlike boat fishing, shore fishing's 293,000 trips occur mostly in the Fall and on weekdays. Most boat fishing trips are in the Summer and on weekends. Over 58 percent of shore fishing trips take place at Sixteen- and Twenty-Mile creeks. Additional fishing piers are suggested at the State Park and Misery Bay. Development of additional piers is given medium priority because existing shore access is only occasionally crowded. A breakwater or retaining wall between Cascade Docks and the Chestnut Street pool is recommended. It would cost \$900,000.

Business services provided to fishermen are important to their enjoyment of the experience. Charter boat services are readily available. Party boat services are extremely limited and panfishing charters are not available. Initiation of party boat services should be pursued. Panfishing charter services should be initiated by the fishery development coordinator.

Fishing guide services remain uncoordinated and ice fishing services are not available. Boat rental services are also limited, there are only two and neither provides fishing tackle. Fish cleaning, smoking, fileting, and packaging services are not available.

Each of these business services should be provided in order to increase Erie's competitiveness. The Fishing Information Center should serve as the referral center for fishing guides. These guides would provide on-shore assistance to fishermen unfamiliar with fishing or with Erie. The city and the Fishing Information Center should promote

provision of additional boat and equipment rentals. Fish cleaning, smoking, fileting, and packing services should be encouraged among retail fish outlets.

Each recommended development action is accompanied by its cost of implementation. These costs are summarized in the following table:

SUMMARY OF POTENTIAL DEVELOPMENT ACTIONS, ERIE, 1983

<u>Proposed Action</u>	<u>Annual Costs</u>			<u>Total</u>
	<u>Priority Level</u>			
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
<u>Population Development</u>				
<u>Stocking Programs</u>				
Additional Coho		\$ 86,000		\$ 86,000
Additional Chinook		79,000		79,000
Additional Steelhead	\$ 19,000			19,000
Walleye			\$1,150,000	1,150,000
Yellow Perch (\$2,600,000) <u>1/</u>				-
Smallmouth Bass			611,000	611,000
<u>Spawning Habitat</u>				
Rock Shallows(Walleye)		8,000		8,000
Gravel Bed (Smallmouth)			1,500	1,500
Artificial Reefs			15,000	15,000
Subtotal Populations	\$ 19,000	\$173,000	\$1,777,500	\$1,969,500
<u>Promotion/Information</u>				
Staffing	\$ 45,000			\$ 45,000
Information Center	12,000			12,000
<u>Advertising</u>				
<u>Newspaper</u>				
Pittsburgh	35,000			35,000
Youngstown		\$25,000		25,000
Cleveland			\$35,000	35,000
Buffalo			35,000	35,000
<u>Radio</u>				
Pittsburgh	10,000			10,000
Youngstown		7,000		7,000
Cleveland			10,000	10,000
Buffalo			10,000	10,000
Direct Mail Advertising		20,000		20,000
Trade Magazines		10,000		10,000
Brochure Production	9,000			9,000
Sportsmens Shows	9,500			9,500
Road Signs	2,000			2,000
Fishing Tournament	5,000			5,000
Subtotal Promotion	\$127,500	\$62,000	\$90,000	\$279,500

SUMMARY OF POTENTIAL DEVELOPMENT ACTIONS, ERIE, 1983

<u>Proposed Action</u>	<u>Annual Costs</u>			<u>Total</u>
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
<u>Business Development</u>				
Charter Boat	\$ 0			\$ 0
Panfish Charters	0			0
Fishing Guides	0			0
Ice Fishing Safari	3,000			3,000
Boat & Equip. Rental		\$5,000		5,000
Fish Cleaning & Pack.			\$ 5,000	5,000
Subtotal Business	\$ 3,000	\$ 5,000	\$ 5,000	\$ 13,000
<u>Boat Access Development</u>				
<u>Launch Ramps, Upgrading</u>				
Commodore Perry	\$ 1,600			\$ 1,600
Waterworks	1,600			1,600
East Avenue	1,600			1,600
<u>Launch Ramps, New</u>				
Elk Creek	49,000			49,000
Shades Beach		\$49,000		49,000
<u>Marina</u>				
Presque Isle (500 Slips)			\$ 490,000	490,000
Subtotal	\$53,800	\$49,000	\$ 490,000	\$592,800
<u>Boat Access Development</u>				
<u>Launch Ramps, Upgrading</u>				
Commodore Perry	\$ 1,600			\$ 1,600
Waterworks	1,600			1,600
East Avenue	1,600			1,600
<u>Launch Ramps, New</u>				
Elk Creek	49,000			49,000
Shades Beach		\$49,000		49,000
<u>Marina</u>				
Presque Isle (500 Slips)			\$ 490,000	490,000
Subtotal	\$53,800	\$49,000	\$ 490,000	\$592,800

SUMMARY OF POTENTIAL DEVELOPMENT ACTIONS, ERIE, 1983

<u>Proposed Action</u>	<u>Annual Costs</u>			<u>Total</u>
	<u>Priority Level</u>			
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
<u>Shore Access Development</u>				
<u>Piers</u>				
ETK Creek	\$ 2,400			\$ 2,400
Presque Isle Deck 2		\$ 1,600		1,600
Misery Bay		1,600		1,600
Waterworks		1,600		1,600
United Refining			\$ 1,600	1,600
Shades Beach			2,400	2,400
<u>Shoreline at Bayfront</u>		<u>\$ 20,000</u>	<u>106,000</u>	<u>126,000</u>
Subtotal	\$ 2,400	\$130,800	\$ 4,000	\$ 137,200
Grand Total	<u>\$205,700</u>	<u>\$419,800</u>	<u>\$2,472,000</u>	<u>\$3,292,000</u>

Forecasts of Fishing Trips and Expenditures

Baseline forecasts indicate a 10-percent increase in fishing trips by 1990. Full development of the recommended program will yield a 65-percent increase in fishing trips. The proposed promotion program will be especially effective in attracting fishermen from outside Pennsylvania and from the Other Western Pennsylvania sector.

FISHING TRIP FORECASTS, ERIE, 1983-1990

<u>Area</u>	<u>1983</u>	<u>1990</u>		<u>Percent Change</u>	
		<u>Baseline^{1/}</u>	<u>Full Development^{2/}</u>	<u>1983-1990</u>	<u>Full Development</u>
Erie	314,100	348,600	430,200	11%	37%
Pittsburgh					
Metro	95,400	103,200	190,300	8%	99%
I-79 Corridor	45,800	49,600	92,500	8%	102%
Other Western					
PA	22,100	23,900	51,200	8%	132%
Subtotal	477,400	525,300	764,200		
Inflow	21,500	23,600	61,100	10%	184%
Total	498,900	548,900	825,300	10%	65%

Types of fishing trips and expenditures are shown below for the baseline and full development scenarios and for the moderate development program, prescribed as 69 percent of full development. Under the moderate development program annual direct expenditures will increase by 70 percent, while full development will yield a 98 percent increase over the baseline forecasts.

EXPECTED FISHING-RELATED EXPENDITURES,
ERIE COUNTY, PENNSYLVANIA, 1990

	<u>Baseline</u>	<u>Full Development</u>	<u>Moderate Recommended Development 1/</u>
<u>Fishing Trips</u>			
Resident With Boat	105,100	129,000	121,500
Resident Without Boat	243,500	301,200	283,400
Subtotal	<u>348,600</u>	<u>430,200</u>	<u>404,900</u>
Non-Resident With Boat	70,900	139,900	121,800
Non-Resident Without Boat	129,400	255,200	212,900
Subtotal	<u>200,300</u>	<u>395,100</u>	<u>334,700</u>
Total Trips	548,900	825,300	739,600
Overnight Stays	32,000	63,200	53,500
<u>Expenditure Per Trip</u>			
Resident With Boat	\$26	\$31	\$30
Resident Without Boat	\$ 3	\$ 4	\$ 4
Non-Resident With Boat	\$28	\$34	\$32
Non-Resident Without Boat	\$11	\$13	\$13
Accommodation Increment	\$25	\$30	\$28
<u>Total Expenditures (000s)</u>			
Resident With Boat	\$2,732.6	\$ 3,990.0	\$ 3,645.0
Resident Without Boat	730.5	1,204.8	1,133.6
Subtotal	<u>\$3,463.1</u>	<u>\$ 5,203.8</u>	<u>4,778.6</u>
Non-Resident With Boat	\$1,985.2	\$ 4,756.6	3,897.6
Non-Resident Without Boat	1,423.4	3,317.6	2,767.7
Subtotal	<u>\$3,408.6</u>	<u>\$ 8,074.2</u>	<u>6,765.3</u>
Overnight Increment	<u>\$ 800.0</u>	<u>\$ 1,896.0</u>	<u>\$ 1,498.0</u>
Total	<u>\$7,671.7</u>	<u>\$15,174.0</u>	<u>\$13,041.9</u>

Applying a 1.5 multiplier to local expenditures and 2.5 for non-local expenditures yields \$17 million of benefits above the baseline for the full development program and \$12.1 million for moderate development. The additional job yields for each scenarios are 340 and 242, respectively.

Commercial Fishing Development Potentials

- o The City of Erie should officially request the Great Lakes Fishery Commission to negotiate harvest agreements with Canada.
- o After the yellow perch population has increased, the Pennsylvania Fish Commission should relax some of its perch regulations to benefit commercial fishermen.
- o Coarse fish processing equipment costs to process 13 tons per day are over \$650,000. Land and building costs add more than another \$350,000 for a total capital investment of over \$1 million. A coarse fish production facility based solely on the Pennsylvania commercial fleet is not economically feasible.
- o The possibility of a coarse fish processing facility in the central basin to serve all U.S. waters should be explored further through the Great Lakes Development Association.
- o The City of Erie should work with commercial fishermen in arranging sufficient dock space at reasonable prices. Dock space is available at the grain elevator or at Cascade Docks.

Primary responsibility for a successful sports fishing development program in Erie must be assumed by local agencies and individuals. Each recommended action must be assigned to a specific agency or individual who has the experience, the time and the personal commitment to carry out the required work on a continuing basis.

The fish population monitoring, regulation and development responsibilities should, of course, remain in the able hands of the Pennsylvania Fish Commission. This agency has a strong track record in meeting the needs of fishermen across the state. Although they could certainly do more were their funding increased, their efforts will continue to be an important part of the total fishing development program.

The promotional program is an extremely important responsibility. The state will continue to provide matching funding for locally raised funds for this form of tourism promotion. The day-to-day design and management responsibility for the program should remain with the Chamber of Commerce as a part of its revitalized and invigorated tourism development program. A senior member of the Chamber staff should be designated and his or her full time efforts made available for this important task.

The shore, dock and boat access recommendations should be coordinated by the Erie-Western Pennsylvania Port Authority. This agency has successful experience in marina development and operation and controls a number of waterfront properties with access development potential. Some of the proposed improvements are the responsibility of the Fish Commission, and the state and county parks departments, respectively, but the coordination of this effort should remain with the Port Authority.

There are important improvements required in the fishing related business services. Charters, guides, equipment and boat rental and others which make up this group which can be provided at a profit by existing and potential future private entrepreneurs.

The overall responsibility for making the fishing development program a success and an important new source of jobs by insuring the successful performance of the various groups identified here is best retained by the Mayor. Erie has a long tradition of strong effective political leadership and this same strong role will be required in this effort. The Mayor has appointed a Bayfront Development Coordinator and this role must be played with continuity and commitment in both public and private efforts if the fishing development program is to be a success.

Section I. EVALUATION OF SPORT FISHING MARKET

Section I. EVALUATION OF SPORT FISHING MARKET

This section evaluates the sport fishing market in Erie, including both local and tourism components. The first part of the section indicates the total number of sport fishing trips made in Erie and the geographical distribution of fishermen by place of residence. This is used to define the fishing market area. The second part of the section examines trends in population and number of licensed fishermen for the various portions of the fishing market area. The third part of this section examines the total trip potential for the trade area and computes Erie's existing share of that potential. Finally, baseline forecasts of the number of potential trips and Erie's share are made.

Current Fishing Activity

The key measurement of fishing activity used in this report is fishing trips. In this report, a trip is defined as one person fishing on one day. Therefore, a group of three people who come to Erie to fish for a weekend (Saturday and Sunday) would be counted as six trips. The number of trips, rather than hours, is used to measure activity because it has the most consistent relationship with expenditures.

The total number of fishing trips made in Erie County during the period June 1981-May 1982 was 480,090, based on a survey conducted by the Pennsylvania Fish Commission. The survey provided point estimates of fishing effort and catch which represent the "best single estimate"

of each of the factors. It also identified a statistical range of possible values. For this report we used only the point estimate, to avoid undue confusion.

Sport fishing activity is difficult to measure because there is no automatic way of keeping a count of the total number of fishing trips. The Pennsylvania Fish Commission recently was funded by Coastal Zone Management to conduct a thorough study of fishing effort and harvest. The Fish Commission hired an outside fishery expert to coordinate the study. Several field workers conducted regular counts of fishermen, fish caught and surveyed fishermen to determine general characteristics. The study was conducted over a full year (June 1981-May 1982) to cover all the different fishing seasons. This study, which is unusual in its depth, has produced the best available estimates of fishing effort and catch.

Some local disagreement with the findings of the fisherman survey has been voiced. However, given the objective and scientific approach of the survey, the results must be considered to be the best available data at this time. Hopefully, continued surveys will allow an improved data base for continued evaluations of fishing.

The nature of fishing activity is extremely variable, fluctuating with a wide range of biological, climate and other factors. Fishing effort in any given year can be dramatically different from the preceding or following year. For this reason, it is recognized that the data collected during the 1981-1982 study may not be fully reflective of the "normal" levels of effort or catch. Nevertheless, the study clearly represents the best data on fishing effort and catch in Erie currently

available. It is hoped that this information will continue to be supplemented by regular fishermen and creel surveys.

Market Area

The place of residence of the fishermen using the lake is the principal indicator of the market area served by Erie. Table 1 shows the place of origin of all sport fishing trips.

Table 1. ORIGIN OF FISHING TRIPS, ERIE, PENNSYLVANIA, 1981-1982

<u>Area of Residence</u>	<u>Trips</u>	<u>Share of Total</u> 4/	<u>Share of Tourism</u>
Erie County	302,130	63%	N/A
Pittsburgh Metropolitan <u>1/</u>	92,050	19	52%
I-79 Corridor <u>2/</u>	43,790	9	25
Other Western Pennsylvania <u>3/</u>	21,050	4	12
Eastern Pennsylvania	3,490	1	2
Ohio	9,750	2	5
New York	1,690	1	1
All Other States	<u>6,140</u>	<u>1</u>	<u>3</u>
Total Trips	480,090	100%	100%

1/ Includes: Allegheny, Beaver, Washington, and Westmoreland counties.

2/ Includes: Butler, Crawford, Fayette, Greene, Lawrence, Mercer and Venango counties.

3/ Includes: Armstrong, Bedford, Blair, Cambria, Centre, Clarion, Clearfield, Elk, Forest, Indiana, Jefferson, McKean, Somerset, and Warren counties.

4/ These shares are different from those shown in Appendix Table D-1 (share of anglers by county) due to weighting of boat, ice and shore trips.

Sources: Pennsylvania Fish Commission Angler Survey and Hammer, Siler, George Associates.

Table 1 shows that over 300,000 sport fishing trips were made by residents of Erie County, representing 63 percent of all trips. The Pittsburgh metropolitan area and counties along the I-79 corridor in western Pennsylvania are also important areas of fishing market support. Pittsburgh residents made 92,000 trips, or 19 percent of the total. I-79 corridor residents made 44,000 trips, or nine percent.

Two distinct markets are represented by the different sources of fishing trips. Erie residents fishing in Erie make up the local market, and residents of all other areas make up the tourism market. Table 1 also shows the distribution of the tourist market, after eliminating local Erie trips. When considering only the tourist market, Pittsburgh accounts for just over half of the tourist trips. Counties in the I-79 corridor account for 25 percent of tourism, while other counties in western Pennsylvania account for 12 percent.

Fishing in Erie has attracted few fisherman from surrounding states, or from the central and eastern portions of Pennsylvania. Ohio, with just under 10,000 trips, is the largest source of out-of-state trips. This is only five percent of total tourism. Several different Ohio cities contribute to the fishing tourism, but no individual city is currently a major market source. Many of the Ohio trips originate in the Youngstown area, which is relatively close to I-79. Cleveland, with its large population base and close proximity, also contributes to Erie's sport fishing industry. New York State generates just under one percent of the fishing tourism, in spite of the relatively close proximity of Buffalo with its large population concentration. Future promotions and activities should try to tap these underutilized nearby population centers.

The market area served by Erie extends directly south along the I-79 corridor, with Erie's market attraction diminishing sharply with distance from I-79. Table 1 and Appendix Table D-1 identify the primary and other trade areas served by Erie. The areas beyond the identified trade area generate an additional "inflow" for the total Erie fishing activity.

Market Area Potentials

The potential for fishing trips in the market area is indicated both by the total population in those areas and by the number of licensed fishermen. Table 2 shows population and fishing license trends for the primary market areas.

Table 2. POPULATION AND FISHERMEN, ERIE FISHING TRADE AREA, 1970-1980

	<u>Population</u>		<u>Licensed Fisherman</u>		<u>Share With License</u>	
	<u>1970</u>	<u>1980</u>	<u>1970</u>	<u>1980</u>	<u>1970</u>	<u>1980</u>
Erie	263,654	279,780	24,370	34,130	9.2%	12.2%
Pittsburgh Metropolitan	2,401,362	2,263,894	138,150	178,350	5.8%	7.9%
I-79 Corridor	696,992	737,424	78,400	117,630	11.2%	16.0%
Other						
Western PA	993,860	1,047,457	114,965	151,389	11.6%	14.5%
Other Pennsylvania	7,444,898	7,538,173	423,470	524,677	5.7%	7.0%
Pennsylvania Total	11,800,766	11,866,728	779,355	1,006,176	6.6%	8.5%
New York		17,557,288		880,973		5.0%
Ohio		10,797,419		986,428		9.1%

Sources: Bureau of the Census; Pennsylvania Fish Commission; and Hammer, Siler, George Associates.

The share of population holding a fishing license has been increasing throughout Pennsylvania since 1970. Table 2 shows that for Pennsylvania as a whole 8.5 percent of the population had a fishing license in 1980, an increase from 6.6 percent in 1970. In Erie's western Pennsylvania market area, the increase in fishing licenses has been even more substantial. Erie County increased its share of population with licenses from 9.2 percent to 12.2 percent. The Pittsburgh metropolitan area has a smaller than average share of population with licenses, 7.9 percent in 1980. However, its rate of increase is also greater than that in the state as a whole.

The total number of licensed fishermen in Erie increased from 24,000 to 34,000 during the 1970s, a 40-percent growth. This increase occurred at the same time as an increase in the basic resident fishing license price from \$5.00 to \$9.00. (In constant 1980 dollars, the price actually dropped from \$10.60 to \$9.00.) The primary factors believed to be responsible for the substantial increase in license sales are the substantial improvements in Lake Erie water quality and the substantial increase in salmon stocking efforts. These factors also are believed to have contributed to the 35-percent increase in licensed fishermen in the overall western Pennsylvania market area.

Erie Penetration Rates

The number of licensed fishermen is important in indicating the total extent of potential trips available within the Erie market area. The average number of fishing trips per year made by fishermen varies widely from area to area and is strongly related to the quality of nearby fishing. However, surveys conducted in Pennsylvania state parks as a whole, suggest that 14 trips per year per licensed fisherman is a

is a reasonable indicator of total potential (Pennsylvania Department of Environmental Resources 1975 & 1977 Summer Recreation Survey). This would recognize that the serious fishermen makes many more than 14 trips per year, while less serious fishermen make fewer trips. An average of five fishing trips of the 14 are typically made outside the local area. This was estimated based on data obtained from surveys included in Jane Winslow's thesis, Private Boat Walleye Angling in The Ohio Waters of Lake Erie: An Economic Evaluation. Again, the non-local share of trips is heavily determined by the quality of fishing resources. Five non-local trips can be used as an order of magnitude indicator. Table 3 shows total market potential and penetration rates currently achieved by Erie.

Table 3. SHARE OF ALL PRIMARY SUPPORT AREA FISHING TRIPS MADE TO ERIE COUNTY 1981-82

<u>Home of Fisherman</u>	<u>Fishing Trips To Erie County</u> 1/	<u>Total Fishing Trips</u>	<u>Share To Erie</u>
Erie County	302,130	477,820 2/	63.2%
<u>Tourist Market</u>			
Pittsburgh Metro	92,050	891,750 3/	10.3%
I-79 Corridor	43,790	588,150 3/	7.5%
Other Western Pennsylvania	21,050	756,945 3/	2.8%
Subtotal	156,890		
All Other 4/	21,070	N/A	

1/ Taken from Table 1.

2/ Based on 14 total trips per year.

3/ Based on an average of five non-local, or tourist, trips per year.

4/ Includes New York and Ohio.

Source: Hammer, Siler, George Associates.

The computation of penetration rates among Erie County residents and for the tourist component of fishing activity have been separated in Table 3 because of a different approach to fishing potential. Erie County trip potential is computed on the basis of the total 14 fishing trips per year per fisherman. With 34,100 fishermen, there are 477,820 expected annual trips. Lake Erie is currently capturing just over 300,000 of these trips, or 63 percent. The remaining trips represent inland fishing in Erie County or outflow to such areas as Lake Simcoe, Erie Western Basin, Kinzua Dam, Pymatuning and others. The outflow from Erie County for fishing is substantially less than the industry average because Erie has substantially better than average fishing resources.

Trip potential computed for Pittsburgh, I-79 corridor and other western Pennsylvania is based only on the average five non-local trips average per fisherman. Using only non-local trip expectation for the 178,000 Pittsburgh fishermen suggests that almost 900,000 non-local trips would be made. Erie is capturing 92,000 of these non-local trips or 10.3 percent of potential. Erie's capture rate is slightly lower for I-79 corridor residents and substantially lower for other residents of western Pennsylvania.

Forecast Baseline Potential

Baseline forecasts of fishing trips are made as a basis of comparison for evaluating the leverage of possible actions. The baseline forecasts assume no new actions designed specifically to increase fishing trips. A small increase in trips is expected only because of normal population growth in the market area and a continued increase in the share of population holding a fishing license. Forecasts of potential trips under various development programs will be made in a later

section of this report. Table 4, on the following page, shows expected population changes and the expected number of licensed fishermen by subareas.

Table 4. FORECASTS OF POPULATION AND FISHERMEN, ERIE FISHING TRADE AREA, 1983-1990

	<u>Population</u>			<u>1983-1990</u>
	<u>1983</u>	<u>1987</u>	<u>1990</u>	<u>Change</u>
Erie	284,200	291,000	298,000	13,800
Pittsburgh Metro	2,259,100	2,254,000	2,250,000	-9,100
I-79 Corridor	749,000	756,000	777,800	28,800
West Central PA	1,050,000	1,085,000	1,101,000	51,000
Other Pennsylvania	7,542,000	7,603,000	7,631,000	89,000
Total	11,884,200	11,990,300	12,058,100	173,900

	<u>Licensed Fishermen</u>			<u>1983-1990</u>
	<u>1983</u>	<u>1987</u>	<u>1990</u>	<u>Change</u>
Erie	36,000	37,600	39,400	3,400
Pittsburgh Metro	187,000	193,000	200,000	13,000
I-79 Corridor	122,000	126,400	132,200	10,200
West Central PA	156,000	164,000	170,700	14,700
Other Pennsylvania	558,000	585,400	610,500	52,500
Total	1,059,000	1,108,100	1,153,400	94,000

Source: Hammer, Siler, George Associates.

Population forecast for Erie are taken from our Port and Bayfront Development Potentials study. Pittsburgh forecasts correspond to the household forecasts made for the previous study, assuming only slight declines in average population per household; forecasts for all other areas are straight line extensions of the 1970-1980 population trend.

The share of total population with fishing licences has been rising during the past decade at a substantial rate. Continued increases can

be expected, but the rate of increase is likely to slow. Overall, population and license growth are expected to support an increase in the number of licensed fishermen by 1990 of about 14 percent. The impact of this growth on expected trips in Erie is shown in Table 5.

Table 5. BASELINE FISHING TRIP FORECASTS, ERIE, 1983-1990

<u>Area</u>	<u>Penetration^{2/} Rates</u>	<u>Baseline^{1/}</u>		
		<u>1983</u>	<u>1987</u>	<u>1990</u>
Erie County	63.2%	318,500	332,700	348,000
Pittsburgh Metro	10.3%	96,300	99,800	103,200
I-79 Corridor	7.5%	45,700	47,400	49,600
West Central PA	2.8%	21,800	503,000	525,300
Subtotal		<u>482,300</u>	<u>503,000</u>	<u>525,300</u>
Inflow (4.6%)		<u>22,200</u>	<u>23,100</u>	<u>24,100</u>
Total		504,500	526,100	549,400

1/ Assumes Erie penetrations to hold at present level.

2/ Taken from Table 3 and applied to total fishing trips expected based on forecasts of total licensed fishermen in Table 4.

Source: Hammer, Siler, George Associates.

Baseline forecasts, shown in Table 5, assume that Erie's competitive position will not change and the penetration rates for all of the market subareas are the same as 1982 and that the number of trips per licensed fisherman remains constant. Total trip potential is expected to increase from the 1981-1982 total of 480,090 trips to 549,400 by 1990. This assumes a continuation in current fishery development efforts including stocking programs and regulations, but not substantial new programs.

Programs recommended in this study are designed to increase the Erie share of the market, and so increase the total number of trips.

Programs are also designed to take advantage of the market growth for business development.

The capture rates currently realized by Erie are reasonable considering the wide variety of other fishing opportunities available to residents of these areas. Section III provides an assessment of key fishing quality factors which are important in fishing location decisions. The next section continues with an analysis of the economic impact of existing fishing activity.

Section II. THE ECONOMIC IMPACT OF SPORT FISHING

Section II. THE ECONOMIC IMPACT OF SPORT FISHING

This section summarizes our estimate of the business generated in Erie by sport fishing. The current level of fishing-oriented expenditures made in Erie County is the principal indicator of the economic impact of the sport fishing industry. Total expenditures for fishing were examined based on interviews with numerous fishing-oriented businesses and on general national data for these types of businesses.

Fishing-Oriented Expenditures

There are several categories of expenditures which are regularly made by people on fishing trips. The type of expenditure and the amount will vary with the type of trip. This section considers several critical differences in trip types in estimating the economic impacts. The first difference is between local residents and tourists. Local residents will contribute to the economy through direct expenditures for fishing-related items including bait, tackle and boat services. Tourist fishermen contribute these direct fishing-oriented items, but also bring additional money into the economy for food and beverage expenditures, automotive gasoline and accommodations.

The approach to measuring the total economic impact of fishing was to survey direct fishing-oriented industries and to make assumptions based on secondary survey data on other expenditures. Table 6 summarizes estimated total expenditures by industry type.

Table 6. FISHING-RELATED SALES AND EXPENDITURES, ERIE COUNTY, 1982

<u>Category</u>	<u>Number of Businesses</u>	<u>All Fishing- Related Sales</u>	<u>Non-Local Sales</u>
Bait/Tackle	10 <u>1/</u>	\$1,500,000	\$ 55,000
Charters and Party Boats	12	140,000	126,000
Boat Sales and Service	22	2,750,000	825,000
Marina	9	300,000	123,000
Motel Accommodations	50	200,000	200,000
Campgrounds	18	300,000	300,000
Food and Beverage	N/A	666,000	666,000
Gasoline and Auto	N/A	<u>890,000</u>	<u>890,000</u>
Total		\$6,746,000	\$3,685,000

1/ Another 15 sporting goods stores also carry smaller lines of fishing equipment.

Sources: Census of Retail Trade and Selected Services and Hammer, Siler, George Associates.

Table 6 shows that a total of \$6.7 million in fishing-related sales were made in Erie County during 1982. Of that total, \$3.6 million were made to non-local fishermen. The categories generating the greatest dollar impact are boat sales and service, and bait and tackle dealers. Together, these accounted for 63 percent of total sales.

A listing of selected fishing-oriented businesses contacted in estimating sales is provided in Appendix C. Industry data in general was obtained from the following U.S. Department of Commerce Publications: County Business Patterns, Census of Retail Trade and Census of Selected Service Industries. Average expenditure per trip data were estimated based on past Hammer, Siler, George Associates' work in other areas. Fishing trip expenditure data from Private Boat Walleye Angling in The Ohio Waters of Lake Erie: An Economic Evaluation, (Jane Winslow, 1982) was also reviewed. Gasoline expenditures were estimated using travel distances to major market areas.

Boat sales and service includes several subcategories: fuel; equipment sales and repair services. Fishing-oriented sales were based in part on the estimates of boat dealers as to the share of their sales which support fishing rather than other forms of pleasure boating. Most people who own boats will use the boat for both pleasure boating and fishing. Larger boats tend to be used less frequently for fishing than smaller boats. Sales made by marinas for boat storage were also prorated to identify only the fishing share of expenditures.

The non-local share of sales was estimated in part based on interviews with the various merchants and in part based on the non-local share of total fishing trips. Some sales were defined to be included only when made by non-local fishermen. These include accommodations (both campgrounds and motels), eating and drinking and automotive gasoline and service.

Expenditures by Type of Trip

Data collected on fishing-oriented sales and expenditures suggested that there were three different factors which have a significant impact on the level of economic impact: boat use, non-local residence and overnight stays. Table 7 groups all the fishing-oriented sales into categories representing the various important subcategories. These are compared with the number of trips and used to compute sales per trip ratios in the various categories.

Table 7. DISTRIBUTION OF SALES BY TYPE OF TRIP, ERIE COUNTY, 1982

	<u>Resident</u>	<u>Non-Resident</u>	<u>Total</u>
<u>Fishing Sales 1/</u>			
<u>Boat Trips 2/</u>	\$2,401,000	\$1,993,000	\$4,394,000
Non-Boat Trips	660,000	1,692,000	2,352,000
Total	<u>\$3,061,000</u>	<u>\$3,685,000</u>	<u>\$6,746,000</u>
<u>Fishing Trips</u>			
Boat	91,090	62,990	154,080
Non-Boat	211,040	114,970	326,010
Total	<u>302,130</u>	<u>177,960</u>	<u>480,090</u>
<u>Sales Per Trip</u>			
Boat	\$26	\$32	
Non-Boat	\$ 3	\$15	

1/ Taken from Table 6.

2/ Includes the categories of boat sales and service and marina from Table 6, and prorated shares of other categories.

Sources: Pennsylvania Fish Commission Angler Survey and Hammer Siler, George Associates.

Table 7 shows that non-resident boat trips, at \$32 per person per day, produce the greatest economic impact for one fishing trip. The overnight increment indicates the extent of additional expenditures with an overnight stay. This increases both the boat and non-boat trip expenditures of non-residents by \$25 per person due to additional food and beverage sales and the cost of accommodations. Table 8 summarizes the daily expenditure for groups on the various types of trips.

One component of the non-resident expenditures is generated by overnight stays through purchase of additional food and beverages and the accommodations. The overnight increment adds only about \$4 to the average expenditure per trip, because the majority of trips (84 percent) are day-trips. An estimated 28,000 overnight stays are estimated annually. This generates revenues of \$700,000 for accommodations and

food, or \$25 per person-night. These costs are relatively low because most overnight stays are in campgrounds or on boats.

Table 8. ESTIMATED DAILY EXPENDITURES PER PERSON AND GROUP BY TYPE OF TRIP, ERIE COUNTY, 1982

<u>Trip Type</u>	<u>Expenditure Per Person</u> ^{1/}	<u>Average Group Size</u>	<u>Expenditure Per Group</u>
Resident Without Boat	\$ 3	3.0	\$ 9.00
Resident With Boat	\$26	3.0	\$ 78.00
Day Visitor Without Boat	\$11	3.5	\$ 38.50
Day Visitor With Boat	\$28	3.5	\$ 98.00
Overnight Visitor Without Boat	\$36	3.5	\$126.00
Overnight Visitor With Boat	\$53	3.5	\$185.00

^{1/} Resident expenditures taken directly from Table 6; visitor expenditures adjusted for overnight increment.

Source: Hammer, Siler, George Associates.

Table 8 shows per person expenditures increasing from \$3 for residents fishing without a boat to \$53 for an overnight visitor fishing with a boat. The range of economic impacts suggests that there is substantial leverage in designing fishery development programs to meet the sector of the industry which produces the greatest revenues.

Average group sizes are slightly higher for out-of-town fishermen, primarily because the out-of-town groups will include fewer one- and two-person groups who decide to make a quick fishing trip. Assuming that the average group size for non-local fishermen is 3.5, the total daily impact for groups fishing with a boat and staying overnight is estimated to average \$185 in 1982 dollars. Group sizes are shown for illustrative purposes only.

Expenditures per person and group will be used as a key element in evaluating the potential benefits of recommended development programs in a later section of this report.

Expenditures by Species Sought

In addition to an evaluation of expenditures made by type of trip, a similar evaluation will be made by fish species sought. Erie has a wide variety of species available, but some species are much more important from an economic standpoint due to the differences in local versus non-local preferences and in shore versus boat effort. This part of the section evaluates fishing effort for each major species and the economic impact attributable to the species.

Only six species receive at least five percent of the total sport fishing effort: coho and chinook salmon, yellow perch, walleye, steelhead (or rainbow) trout, and smallmouth bass. Table 9 shows the distribution of species targeted by local and non-local sport fishermen.

Table 9. FISH SPECIES TARGETED BY SPORTSMEN, ERIE COUNTY
RESIDENTS AND NON-RESIDENTS, 1981-1982

Species	Survey Responses		Share of Effort	
	Non-Local	Local	Non-Local	Local
Coho Salmon	2,713	1,182	38%	10%
Chinook Salmon	918	334	13	3
Steelhead Trout	628	1,159	9	10
Yellow Perch	570	4,723	8	40
Smallmouth Bass	415	537	6	4
Walleye	304	725	4	6
Largemouth Bass	121	135	2	1
Black Crappie	120	430	2	4
All other specified	123	485	2	4
"Anything that bites"	<u>1,200</u>	<u>2,220</u>	<u>16</u>	<u>18</u>
Total Responses	7,112	11,930	100%	100%

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 9 shows that the salmon are clearly the preferred species among non-local fishermen while yellow perch is the most frequent target of local fishermen. Non-local fishermen target the following species (in order of importance): salmon, steelhead trout, yellow perch, bass and walleye. Local fishermen target the same species, but the priority order is substantially different: yellow perch, salmon, steelhead trout, walleye and bass.

Species targeted by sportsmen were used as a basis for allocating fishing trips to the species sought. Table 9 includes some double counting which occurred because fishermen often responded that they were seeking more than one species, such as coho and chinook salmon. Responses were re-allocated to eliminate the double count based on discussions with the survey coordinator. The adjusted distribution was applied to trips by type in Table 10. Boat and non-boat shares were determined based on catch by species.

Table 10. FISHING TRIPS ATTRIBUTABLE TO FISH SPECIES, LAKE ERIE, PENNSYLVANIA, JUNE 1981-May 1982

Species	Non-Local	Erie	Non-Local	Erie	Total
	Resident Boat	Resident Boat	Resident Non-Boat	Resident Non-Boat	
Coho Salmon	22,280	8,320	40,450	18,060	89,110
Chinook Salmon	7,560	2,360	13,800	5,190	28,910
Steelhead Trout	1,080	1,930	13,330	23,750	40,090
Yellow Perch	4,800	32,240	11,070	91,300	139,410
Smallmouth Bass	7,520	9,230	4,050	4,970	25,770
Walleye	8,110	18,080	430	950	27,570
Largemouth Bass	2,010	1,900	1,370	1,730	7,010
Panfish <u>1/</u>	9,200	16,220	29,830	63,880	119,130
Other Game Fish	430	810	640	1,210	3,090
Total	62,990	91,090	114,970	211,040	480,090

1/ Includes "anything that bites."

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 10 allows a comparison of the importance of each fish species in generating fishing trips. Yellow perch generates the greatest number of trips and is followed by "panfish." The panfish category includes those seeking "anything that bites" as well as specified panfish such as crappie. Coho salmon generates the third largest number of trips.

The economic impact of each species is somewhat different than the number of trips generated because boat trips and non-local fishermen trips have higher economic impacts. Table 11 summarizes the economic impacts for each species.

Table 11. FISHING-ORIENTED EXPENDITURES ATTRIBUTABLE TO SPECIES, LAKE ERIE, PENNSYLVANIA, 1982

<u>Species</u>	<u>Expenditures Generated</u> ^{1/}	<u>Share</u>
Coho Salmon	\$1,606,000	23.8%
Chinook Salmon	472,000	7.0
Steelhead Trout	358,000	5.3
Yellow Perch	1,450,000	21.5
Smallmouth Bass	560,000	8.3
Walleye	762,000	11.3
Largemouth Bass	121,000	1.8
Panfish	1,370,000	20.3
Other Game Fish	47,000	0.7
Total	\$6,746,000	100.0%

^{1/} Computed by applying the number of trips in Table 10 to expenditure averages in Table 7.

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 11 shows that coho salmon has the greatest economic impact, generating \$1.6 million in expenditures. Yellow perch has the second greatest impact at \$1.4 million, and panfish contributes another \$1.4 million. Table 12 summarizes trips and expenditures for the major fish groups.

Table 12. SUMMARY OF TRIPS AND EXPENDITURES GENERATED BY MAJOR SPECIES GROUPS, LAKE ERIE, PENNSYLVANIA, 1982

<u>Species Group</u>	<u>Share of Trips</u>	<u>Share of Expenditures</u>
Perch and Panfish	54.5%	41.8%
Salmonids <u>1/</u>	32.9	36.1
Walleye	5.7	11.3
Bass <u>2/</u>	<u>6.8</u>	<u>10.8</u>
Total	100.0%	100.0%

1/ Includes only coho, chinook, and steelhead.

2/ Includes other game fish.

Source: Hammer, Siler, George Associates.

Table 12 shows that perch and other panfish combine to form the dominant share of all fishing trips, accounting for more than half of the total. Perch and other panfish also account for the largest share of expenditures, about 42 percent.

The salmonids, which have been stocked only in the past decade or so, have achieved an important position in Erie's sport fishing industry. They generate almost a third of the total fishing trips and 36 percent of fishing-related expenditures.

Expenditures by fish species will be an important component when evaluating potential economic benefits of development actions in a later section of this report.

Section III. ERIE'S COMPETITIVE POSITION

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Erie is competing with other fishing areas to attract the non-local fishing trips made by residents of its trade area. It is also competing to retain a larger share of the fishing trips made by Erie residents. This section identifies the principal competitive fishing areas. Key factors in determining where fishermen choose to fish are identified, and Erie's competitive position for each is evaluated. Actions which could improve Erie's competitive position are also identified.

Competitive Fishing Areas

The quality of fishing and access in Erie can only be evaluated relative to the other areas with which it competes. These areas are the ones which would be frequently used as alternatives to Erie by residents of the primary market area. Interviews with outdoor sportswriters and fishing tackle dealers in Pittsburgh and surrounding areas were used to identify the major spots to which Pittsburgher's travel for fishing. These are listed in Table 13.

Table 13. PRIMARY COMPETITIVE FISHING AREAS, PITTSBURGH RESIDENTS, 1983

<u>Fishing Area</u>	<u>Principal Target Species</u>	<u>Water Area (Acres)</u>	<u>General Location</u>
Presque Isle Bay	Perch, Bass	3,300	Erie
Lake Erie, PA	Salmon, Walleye, Perch	N/A	Erie
Lake Erie, Western	Walleye, Bass	N/A	Sandusky
Kinzua Dam	Walleye, Muskie	12,000	Northwestern PA
Pymatuning	Walleye, Perch, Bass, Carp	13,500	I-79 Corridor
Conneaut Lake	Muskie, Bass, Northern	925	I-79 Corridor
Lake Wilhelm	Northern	1,680	I-79 Corridor
Shenango Lake	Bass, Northern, Walleye	3,550	I-79 Corridor
Lake Arthur	Muskie, Northern, Walleye	3,225	I-79 Corridor
Cheat Lake	Muskie, Bass, Walleye	3,000	Southwest PA
Youghiogheny Lake	Muskie, Bass, Walleye	2,800	Southwest PA
Canadian Fishing	Muskie, Walleye, Bass	N/A	Ontario
Trout Streams	Northern Trout	N/A	Western PA

Source: Hammer, Siler, George field surveys.

Table 13 includes fishing areas which can be grouped into three general categories:

- o Small convenient lakes
- o Larger lakes with more substantial fish populations and access
- o The Great Lakes

Two of the listings, Canadian Fishing and Trout Streams, represent general categories in themselves.

Small Convenient Lakes, defined here as 4,000 acres or less, are popular principally because of their close proximity to fisherman's residences. Lakes of this type which compete with Erie include Conneaut, Wilhelm, Shenango, Arthur, Cheat, and Youghiogheny. All of these have a reasonable supply of stocked game fish (walleye,

muskellunge, smallmouth and largemouth bass, and northern pike) and a local population of various panfish. While some natural populations of gamefish are present, a sufficient number to attract fishermen generally requires stocking. However, the size and quality of the game or panfish populations is not sufficient to attract fishermen from great distances. These lakes have poorer quality fishing than Erie, but are competitive because they are closer and more convenient for the Pittsburgh or I-79 corridor resident.

Larger Lakes with more substantial fish population and access are more desirable and can attract fishermen from greater distances. Pymatuning and the Allegheny Reservoir at Kinzua Dam are included in this category. These lakes also have stocked (and some native) game fish and native pan fish populations. The large size of these lakes allows more natural reproduction and helps the fish grow larger. These lakes are better able to compete with Erie on fish populations than the smaller lakes, but the overall quality of fish is still not as good. These lakes provide a combination of convenience due to proximity and a more natural (as opposed to urban) setting as their principal means of attracting fishing trips.

The Great Lakes include Erie and the Sandusky/Port Clinton area as its chief competition. Lake Michigan attracts many salmon fishermen, but its substantial distance from Erie's market area has limited Michigan's market share. The natural quality of fishing in the Great Lakes is far superior to that found in inland waters which must rely more heavily on stocked fish. Recent stocking of salmonids has substantially increased the attractiveness of the Great Lakes for sport fishermen.

Lake Erie is divided into three distinct habitats: the Eastern, Central and Western basins. Erie is situated closest to the Eastern Basin, but also includes the transitional area between the east and central basins. The Eastern Basin provides deeper and cooler water which is particularly attractive to the salmonids. The Western Basin provides shallow warmer water which is ideal for walleye and bass. Presque Isle Bay provides a unique "lake-within-a-lake" environment which interacts with the larger lake, but also supports substantial bass and panfish populations. The greatest common link throughout Lake Erie is yellow perch, which is relatively abundant in all three basins as well as Presque Isle Bay.

Canadian Fishing includes a wide variety of lakes and streams. These are excellent natural fishing areas, often with an abundance of game fish. The attractiveness of good game fish populations and wilderness settings makes Canada an important fishing destination. However, the considerable travel time and cost limit the total number of fishing trips made to Canada.

No particular areas within Canada were identified as a focus of trips for Pittsburgh residents. However, Lake Simcoe is a popular destination for Erie residents seeking its abundant yellow perch.

Trout Fishing Streams attract many fishing trips primarily during the first week of trout season. The stocking of full grown trout prior to the opening of the season insures good initial catches. This effort is widely made throughout the state, and is primarily important during the first weeks of the season in April.

Summary. There are a wide variety of fishing opportunities available for residents of Erie's fishing market area. Erie has been attractive because of its quality natural fishing. Some competitive areas provide better fishing for selected species, but less convenience, while other competitive areas are more convenient than Erie but have significantly less fish resources.

Fishing Area Choice Factors

The remainder of this section identifies the factors which lead fishermen to choose specific fishing destinations and evaluates Erie's competitive position.

Fish Populations. The status of the fish population in any area is the most critical factor determining the area's overall desirability. The quality of the fish population is based on the types of fish available and the number and size of each species.

Fishing Promotion and Information. Promotion and information activities are an important factor in the attractiveness of any fishing area and cannot be overlooked. Promotion activities are needed to get non-local fishermen to an area for the first time so that they get to know about the fishing resource available. Providing good information for the fisherman once he has arrived in Erie is another important component of this factor. This includes getting the non-fishing tourist to try fishing while in Erie.

Shore Fishing Locations. Most fishing trips are made without boats, so the amount and quality of shore access for fishing is of importance in insuring that a fishing trip is enjoyable and productive.

This is the only way to assure return trips, which must make up the major share of total tourism fishing activity.

Boat Access. Boat fishing trips, while fewer than shore trips, represent a substantial share of the total. Boat trips also generate a substantially higher economic impact than shore trips, making them more desirable from an economic development standpoint. Good boat access is important in assuring that fishermen have a good fishing experience in Erie and choose to return.

Business Services. The quality to business services for the fishermen is another factor which affects how happy he is with his experience in Erie. A sufficient array of services is needed to assure that fishing is convenient and easy for the novice or occasional fisherman.

Distance. The distance to any given fishing area and the travel costs to that area have an important impact on its desirability. Erie has no control over this factor, which is important in setting the limits of the fishing market area.

Environmental Amenities. The overall environmental amenities of a fishing area is a critical factor for fishermen who fish primarily as a means of enjoying nature. This is another competitive factor which Erie will have no power to change significantly, but which must be considered in the assessment of Erie's fishing market potential.

Each of these competitive factors effecting fishermen choices among available fishing opportunities is discussed in the paragraphs which follow.

Fish Populations

In most respects the fish population in Erie is its most important competitive advantage. The principal strength of the Erie fish population lies in the diversity of good fishing over a wide variety of species. Most of the individual species which are considered valuable targets are present in Lake Erie and/or the bay in sufficient numbers to represent a reasonably good quality fishery.

Fish Population Overview

General indications of the relative quality of fishing is indicated by a comparison of sport fishing effort and catch. Table 14 compares the key sport targeted species. Some double counting of effort is included in closely related species, primarily coho and chinook salmon.

Table 14. ANGLER HOURS AND FISH HARVESTED, PENNSYLVANIA WATERS OF LAKE ERIE, JUNE 1981-MAY 1982

<u>Specie</u>	<u>Effort In Hours</u>	<u>Fish Caught</u>	<u>Harvest</u>	<u>Time Required To Catch One Fish</u>	<u>Time Required To Harvest One Fish</u>
Yellow Perch	329,900	681,200	498,100	0:29	0:40
Walleye	185,400	40,800	37,200	4:33	5:00
Coho Salmon	323,300	44,900	43,200	7:12	7:41
Chinook Salmon	105,600	8,100	7,900	12:59	13:22
Steelhead Trout	112,300	18,000	14,800	6:15	7:35
Smallmouth Bass	119,000	90,600	33,100	1:19	3:35
All Other	223,100	492,100	198,700	N/A	N/A
Total	1,398,600	2,558,300	833,000	0:33	1:41

Notes: N/A is not applicable. The effort and catch figures in this category are not comparable.

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 14 shows that the time required, on the average, to catch a target species ranged from a low of 29 minutes per yellow perch to a high of almost 13 hours per chinook salmon. Harvest rates require even greater expenditure of time due to catches of undersized fish or the sportsman's tendency to return some fish regardless of size. Perch required 40 minutes on the average per harvested fish, smallmouth bass required 3 hours and 35 minutes, walleye required five hours, and coho salmon almost eight hours. The catch rates in Table 10 are overall averages. The rates vary significantly based on the area of fishing and the season. The greatest fishing productivity per hour of effort was winter ice fishing.

Fish Size. Average fish size and the range of sizes are an important means of evaluating alternative fishing areas. Fishermen often prefer to catch a few "top quality" fish rather than many of poor quality. Within individual species, top quality is usually judged primarily by size and secondarily by the fight, coloring, edibility and markings. Table 15 shows the average size for the most popular species caught in Lake Erie in comparison to the minimum size limit. The size of the largest 25 percent of fish harvested is also shown.

Table 15. AVERAGE FISH SIZE AT HARVEST, LAKE ERIE,
PENNSYLVANIA, JUNE 1981-MAY 1982
 (Data in Inches)

<u>Specie</u>	<u>Minimum Size</u>	<u>Average Size</u>			<u>Average</u>
	<u>Limit</u>	<u>Bay</u>	<u>East</u>	<u>West</u>	<u>Size of</u> <u>Top 25% 1/</u>
Coho Salmon	7	22.8	22.3	22.8	25
Chinook	7	25.0	28.3	26.9	30
Steelhead Trout	7	18.9	18.1	19.8	24
Yellow Perch	None <u>3/</u>	7.6	8.7	9.8	9/12 <u>2/</u>
Walleye	15	16.6	18.1	17.7	20
Smallmouth Bass	12	13.0	13.5	13.5	14
Largemouth Bass	12	13.3	N/A	N/A	15

1/ Defined so that the largest 25 percent of harvested fish are larger than the stated length.

2/ Nine inch is the top quarter in the bay; 12 inch applies to the west lake.

3/ Ohio imposes a seven-inch minimum.

Sources: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 15 shows that the average fish sizes are reasonably good for all target species. The salmonids (coho, chinook and steelhead) are all far above the minimum size limit of seven inches which applies to all types of trout. These fish are exceptional and are only available in large bodies of water. Other fish species average 10 to 30 percent greater than minimum length.

An estimate of sizes for the largest fish is also provided. For coho salmon, a fourth of the fish are 25 inches or larger, while chinook often top 30 inches.

Yellow perch is the only species with dramatically different characteristics based on the location of catch. Perch caught in the bay average 7.6 inches, in comparison with an average of 9.8 inches in the

west lake area. The top 25 percent of bay perch are over nine inches, while in the west lake they are 12 inches. This suggests that there may be a local bay perch population which is distinct from that in the lake as a whole. If this is the case, regulations on the commercial perch fishery are unlikely to have a significant impact on sport catches in the bay.

The following paragraphs discuss the quality and status of the various target fish populations on a species-by-species basis in comparison to competitive areas.

Yellow Perch. Yellow perch is the most important of all Erie's sport fish species in generating total trips and expenditures. It is a highly sought species among local residents, and it is an important component of the catch of non-locals who fish for "anything that bites." It also has moderate importance as a direct target for non-local fishermen.

The perch population in Lake Erie is superior to any available in competitive Pennsylvania lakes. Perch tend to stunt in most Pennsylvania lakes, except for those in the northeast and northwest portions of the state. Erie provides a good habitat for perch. However, some Canadian lakes (notably, Simcoe) have substantially more abundant perch populations than Erie.

An indication of the quality of perch fishing at Erie relative to competitive Pennsylvania lakes is provided by a tabulation of citation-size perch caught. Records for the 1976-1982 period show a total of 386 trophy perch recorded in the state. Of these, 160 or 41 percent were caught in Lake Erie in Presque Isle Bay. Individual competitive lakes

had no more than five trophy perch over the same period. This clearly demonstrates Erie's superiority over other Pennsylvania lakes.

There is a significant size difference between perch caught in the bay and in the lake, with bay perch averaging two inches smaller than lake perch. This suggests that there is a separate bay population of perch which does not migrate through the lake. The small sizes of the bay perch could indicate either of two possibilities:

- o Catch rates are so high in the bay that perch do not survive long enough to reach larger size; or
- o Catch rates are too low, causing the bay perch to compete for food and become stunted.

Further investigation of the age structure is needed to certify the cause of the small size. However, given the substantial ice fishing catch recorded, it is unlikely that the perch catch is too low. If there is a perch population which confines itself to the bay, it is likely to have comparable size characteristics to perch in the small inland lakes.

While Erie has the best perch in Pennsylvania, it must also compete with extremely productive perch fishing in Canada. Lake Simcoe in Canada in particular has become popular with Erie fishermen because of its abundance of perch. However, there is little evidence that Pittsburgh and I-79 corridor residents travel to Canada for perch fishing. This is logical, because they do not target perch to the extent of Erie residents. In summary, Erie is gaining some trips of Pittsburgh perch fishermen because of its good perch fishing relative to Pennsylvania lakes, while losing some Erie fishing trips because of competition from Simcoe.

The yellow perch population in Lake Erie's eastern basin is currently depressed, although not as seriously as in the central basin of the lake. In response to this, both the states of Ohio and Pennsylvania have taken steps to reduce the harvest of perch and, thus, improve the stocks. The success of these measures will depend, to a great extent, on the impact of weather on perch spawning success and fry survival. Canadian commercial fishing is another critical factor because it takes nearly 80 percent of the commercial perch harvest.

Walleye

The walleye fishery at Erie has been overshadowed by an unusually productive western basin fishery. While lagging behind the western basin in total walleye population, the Erie area walleye compares favorably on average size. The walleye prefers a relatively shallow habitat which is characteristic of the entire western basin, but is available only near shore at Erie.

The western basin walleye fishery experienced a dramatic turn-about during the mid-1970s. The fish populations had been declining, and mercury contamination was a problem causing the Ohio Department of Natural Resources to impose strict regulations on sport harvest and to eliminate the commercial harvest. Ohio did not stock any walleye in the western basin. The fishery experienced several unusually successful natural spawning seasons which is the main factor generating the population turn-about. Currently, the western basin is beginning to show signs of substantial population stress. This suggests that a population reduction is likely in the next few years. Some biologists believe there is insufficient forage fish to support the walleye population in the western basin, and stunted growth has already resulted.

Because the habitat of the western basin is much more suitable to the walleye, it is unlikely that Erie will ever be able to consistently match western basin walleye fishing. However, because the two populations are mostly independent of each other, Erie's good years could correspond to poor years in the western basin and generate temporary equality between the two areas.

Erie has better walleye fishing than most competitive inland lakes which are supported by regular walleye stocking. This will continue to produce demand for walleye fishing at Erie among residents of Erie's fishing market area, who are often unwilling to travel the greater distance to the western basin. However, stocked walleye in Pymatuning Lake and the Allegheny Reservoir at Kinzua Dam provide significant competition for Erie. Kinzua had 45 trophy walleye between 1977 and 1982; Pymatuning had 29 and Erie had 82. No other lake in western Pennsylvania had as many as 10.

The walleye fishery is totally dominated by the lake rather than the bay. The lack of walleye availability in the bay has resulted in a decision to try an experimental stocking effort both by the Pennsylvania Fish Commission and through a cooperative effort of local sportsmen at Chestnut Street.

Coho and Chinook Salmon. Salmon fishing at Erie is considered by many to be the best sport fishing available in Pennsylvania. Salmon are a highly prized species because of their large size. In Pennsylvania, these species of salmon are only available in Lake Erie, so that other Pennsylvania lakes are not competitive. Pennsylvania's share of the Lake Erie shoreline provides the best salmon fishing on the lake,

because of its proximity to the deepest waters of Lake Erie. As a result, Erie is superior to any of its nearby competitors.

There are more distant areas which provide equal or superior salmon fishing to Erie. The best salmon fishing is in Lake Michigan which has more and much larger tributary streams than Erie. Lake Ontario provides salmon fishing of comparable quality with Erie. However, the water quality in Lake Erie is better than in either Michigan or Ontario, making Erie's salmon safer and better to eat.

Salmon have virtually no natural reproduction in Lake Erie and are present only through continued stocking efforts. Since the salmon is a "put and take" species, its population status is primarily related to the extent of stocking efforts made. The habitat provided in Lake Erie is of sufficiently high quality to support a large salmon population. Environmentally, the salmon occupy the niche vacated by the blue pike and lake trout. As a result, they have little competition for forage fish and are very successful once introduced.

The return of stocked salmon is limited not only by natural factors, but also by competition with other states and Canada. Salmon stocked in Pennsylvania waters migrate in a circular pattern throughout Lake Erie, traveling to Ohio, New York and Canadian waters. A share of the salmon are caught in each of these jurisdictions by sport fishermen and in Canada by commercial fishermen. Nevertheless, the return to Pennsylvania waters is still substantial and justifies the stocking efforts.

Two principal types of salmon are stocked: coho and chinook. Chinook, or king salmon, have a longer life span and reach a larger size

than the coho. However, the survival rate of the chinook is substantially less than the coho at Erie.

Steelhead Trout

Steelhead trout are a large, migratory variety of rainbow trout. When raised in large lakes, rainbow trout obtain a steel coloring and grow to a much larger size. The larger size of the steelhead makes it an attractive game fish. Like the salmon, it is not available anywhere else in Pennsylvania, which makes it an important target. However, the steelhead receives much less publicity than the salmon.

Steelhead belongs to the salmonid family and is not native to Lake Erie. Like the salmon, it must be stocked and typically will not reproduce in Erie. Steelhead does not die after spawning, however, and remains available during the winter ice fishing season and in following years. Steelhead also are less mobile than the salmon. They are more likely to stay close to Erie's Pennsylvania waters in comparison to salmon which range throughout Canadian, New York, and Ohio waters.

Smallmouth Bass

The smallmouth bass population in the Erie, Pennsylvania area is a very impressive one as demonstrated by the angler harvest, angler catch rates and discussions with local sportsmen. The catch of 47,500 smallmouth during the 1981-82 season in the Presque Isle area yielded a harvest of an estimated 15,700 legal fish. This catch and harvest are greater than the 1975 smallmouth harvest in both the central and Western Basin of Lake Erie (Ohio waters) combined. During that year only 9,966 were harvested. It should also be noted that the Ohio harvest had no

length limit, indicating that the harvest in Ohio waters is far closer to actual catch than the Pennsylvania figures.

Pennsylvania's smallmouth sizes are also greater than those in Ohio. The mean length of Ohio Lake Erie fish was between 12.8 and 14 inches in 1975, 11.8 inches in 1976, and 9.8 to 12.8 inches in 1977. In the 1981-82 season, the mean length of Presque Isle smallmouth was approximately 13 inches. A comparison between the Pennsylvania and Ohio catch rates leads to the conclusion that more fish are caught per hour and fish are generally larger in the Erie area.

Overall, the smallmouth bass fishery is much better than average in Erie. The water quality and habitat is of good quality to support the fish populations, and the catches are good. This fishery should be a source of pride for the Erie area and needs to be emphasized to a greater extent.

Other Species

There are a number of other popular game and panfish available in the bay and lake. Game fish include muskellunge, northern pike, brown trout, lake trout and palomino Trout. These species have all been stocked and most experience some natural reproduction. The populations of these fish are not substantially better than in other stocked waters of western Pennsylvania. As a result, these species do not attract many non-local fishermen.

Total harvest of any of these species is insufficient to make them a strong factor in attracting additional fishermen without additional

promotion. However, their presence does serve to add a dimension to the activity of fisherman who typically would target other species.

Panfish are a much more important component of the total fishery than the supplemental game fish. While perch is typically the target fish, there are several other species which comprise a general panfish fishery. These include: crappie, pumpkinseed, bluegill, rock bass, channel catfish, and bullhead.

Summary of Fishing Quality

Table 16 summarizes the general quality of Erie fishing in comparison to nearby fishing areas and identifies regional preferred locations. Nearby fishing areas are those within Erie's fishing market area (Erie to Pittsburgh).

Table 16. SUMMARY OF ERIE'S COMPETITIVE POSITION BY SPECIES, ERIE, PENNSYLVANIA, 1983

<u>Species</u>	<u>Extent of Fisherman Appeal</u>		<u>Erie Quality Compared To</u>	<u>Preferred Areas(s)</u>
	<u>Local</u>	<u>Non-Local</u>	<u>Nearby Areas</u>	
Yellow Perch	High	Low	Much Better	Canada/Simcoe
Walleye	High	Mid	Similar	Erie West Basin
Coho Salmon	High	High	Much Better	Lake Michigan
Chinook Salmon	High	High	Much Better	Lake Michigan
Steelhead Trout	Mid	Mid	Much Better	None
Smallmouth Bass	Mid	Mid	Slightly Better	None
Other Game Fish	Low	Mid	Same	Various
Other Panfish	Mid	Low	Slightly Better	None

Source: Hammer, Siler, George Associates.

Table 16 shows that yellow perch fishing is much better at Erie than at other lakes in the market area. Better perch fishing can be

found, but it requires a substantial trip to Canada, primarily Lake Simcoe. Walleye fishing of similar quality can be found at nearby Kinzua and Pymatuning. Significantly better walleye fishing is available in the Western Basin area near Sandusky. Salmon fishing is not available anywhere else in the market area, making Erie clearly superior. Better salmon fishing requires a trip to Lake Michigan. Within the market area, steelhead fishing is also only available in Erie. Similarly, the smallmouth bass population at Erie holds its own with any other outside the market area. The general panfish population at Erie is also strong, and there are no other preferred areas in terms of fishing quality.

The summary of Erie's competitive position is based on discussions with Erie and Pittsburgh fishermen, sports writers, and fishing tackle dealers. Table 16 is more a synthesis of knowledgeable opinion than a scientific evaluation. Objective comparative data are not readily available for most fishing areas.

A comparison of fisherman appeal of each species and Erie's quality provides a guide for evaluating the importance of improving the fish population in a later section. Actions which can improve the populations and their costs are discussed below. Costs are rough approximations for analysis purposes. They do not represent specific quoted prices and in most cases more detailed surveys are required before accurate prices can be obtained.

Fish Population Improvement Potential

Several key methods for improving fish populations were examined for each species: stocking, spawning area improvements, regulations,

and artificial reefs. In general, the potential to noticeably improve a natural existing fish population is weak. Nature tends to reach its normal equilibrium and man's actions rarely can produce a significant positive change. Noticeable changes are more easily achieved for non-natural populations, because these may not have had the opportunity to reach their equilibrium stages.

Stocking Programs

The potential to generate a significant increase in fish populations through the use of stocking was evaluated for the principal sport fish which are currently targeted. Dr. Andrew White, of Environmental Resource Associates, undertook the evaluation of stocking potentials. His report is summarized here and included in full as Appendix A.

Smallmouth Bass

The current smallmouth bass population is strong and represents a much better fishery than that found in the other areas of Lake Erie. Research has shown that efforts to improve an existing population of the fish are usually difficult. Studies have shown that a return of only 2.2 percent can be expected for stocking of smallmouth on an existing population. In the bay additional problems of emigration or competition for forage food could make the success rate even less. In order to double the current harvest of 15,800 smallmouth, a stocking program would have to include at least 719,000 fingerlings per year. The cost per fingerling is estimated at \$0.85, indicating a total stocking cost of \$611,000. With the harvest increased by 15,800, this would be a cost per harvested fish of \$38.68.

Yellow Perch

Current yellow perch stocks are depressed in the Erie area, although not as depressed as in the Central basin. Limits on commercial harvests should allow the yellow perch to improve by natural means. However, the factor of the Canadian commercial fishery, which takes nearly 80 percent of the central basin yellow perch, is a possible factor limiting the natural ability of the perch to rebound. This factor is important because of the great mobility of the perch which moves in and out of Canadian fishing waters.

The fall fingerling population in the Erie, Pennsylvania waters is estimated at almost 35 million based on the catch data and population data for the Erie Central Basin. In order to double the sport catch, it would be necessary to double the fall fingerling population by a stocking program. Stocking almost 35 million fingerlings at \$0.40 each would cost about \$14 million and would return 273,000 fish, or about \$52 per harvested fish. Because the perch harvest is substantially larger than any other species, a stocking program designed to return 50,000 fish is a more realistic level of effort. However, this would still cost \$2.6 million and is not be recommended.

Walleye

The stocking of walleye in existing populations has produced returns of only two percent, even in enclosed areas such as reservoirs which were free of a large number of competitive species and did not already have an existing walleye population. In Erie, with the existing population of walleye, a large potential predator population base, and an open lake environment to which the walleye could emigrate,

substantially higher stocking efforts would be required. In order to double the existing sport harvest of 27,900 walleye, it is estimated that 19 million fingerlings would be required, or 115 million fry. The cost for fry stocking at one cent per fry would be substantially less than the cost of the fingerling stocking at 60 cents per fingerling. Still the cost of a stocking program with the potential for doubling the sport catch would be over \$1.1 million, or \$41 per fish. Other biological factors could also interfere with the success of even this level of stocking effort including increased cannibalism and out-migration.

The one possible exception to the poor potential success of walleye stocking is in the bay. Walleye currently are virtually unavailable in the bay and are probably not spawning there. Stocking of walleye in the bay could prove more successful than estimated if the walleye were to remain in the bay. The Pennsylvania Fish Commission is undertaking a major experimental stocking of seven million walleye fry in the bay. This program will be carefully evaluated to determine its success. Future bay stocking efforts will be determined by the success of this initial experimental effort.

Because of the difficulties experienced in stocking walleye in other areas, we have included walleye stocking only as a low priority. This assumes that the experimental program will not show substantial population improvements. If the experiment is a success, then future walleye stocking should be increased to a high priority.

Coho Salmon

Stocking of the salmonids (coho, chinook and steelhead trout) has a higher expectation of success than stocking of native species. In

contrast to the native species, the stocked salmonids are not in competition with their own naturally reproduced population. In addition, they are not in competition with the native species because they fill the ecological niche which was vacated by the blue pike, lake trout, cisco and whitefish.

The Pennsylvania coho program has resulted in returns of 8-10 percent over the two-year harvest period. The cost of coho fingerlings is approximately 20 cents, indicating a cost per caught fish of \$2, if the 10-percent return is achieved.

Chinook Salmon

Chinook salmon have not been as successful in percentage return as the coho. Chinook have an average return of only one percent over a three year harvest period. Given this return rate and a fingerling cost of \$0.10, the cost per caught fish is \$10.

Steelhead Trout

The steelhead trout is much more of a resident fish than the coho and chinook, not straying into Ohio or Canadian waters to the extent of the salmon. As a result, their return has been in excess of 20 percent over a three year-harvest period. At a cost of \$0.25 per fingerling, the average cost per caught fish is only \$1.25.

Summary

In summary, the analysis on expected returns from stocked fish shows that stocking of non-native species is likely to have a much more

significant impact on the population than the stocking of native species on top of existing reproducing populations. The salmonids are particularly successful because they occupy an environmental niche which had been vacated, primarily due to the effects of pollution and environmental change. The lack of substantial competition in this niche increases the survival rate of the salmonids.

Table 17 compares the extent of stocking required to double the sport harvest and the average cost per caught fish for the various species.

Table 17. STOCKING PROGRAM REQUIREMENTS AND COST,
LAKE ERIE, PENNSYLVANIA, 1983

	<u>Stocking Required</u> <u>To Double Catch</u>	<u>Additional</u> <u>Fish</u> <u>Caught</u>	<u>Cost Per</u> <u>Caught</u> <u>Fish</u>	<u>Total</u> <u>Cost</u> <u>(000s)</u>
Smallmouth Bass	719,000 Fingerlings	15,800	\$39.00	\$ 611
Yellow Perch	6,400,000 Fingerlings ^{1/}	50,000	\$52.00	\$ 2,600
Walleye	115,000,000 Fry	27,900	\$41.00	\$ 1,150
Coho Salmon	432,000 Fingerlings	43,200	\$ 2.00	\$ 86
Chinook Salmon	790,000 Fingerlings	7,900	\$10.00	\$ 79
Steelhead Trout	74,000 Fingerlings	14,800	\$ 1.25	\$ 19

^{1/} Based on an average of 50,000 caught fish instead of doubling.

Source: Environmental Resource Associates and Hammer, Siler, George Associates.

Spawning Area Improvements

Pollution in the Presque Isle Bay has been much better controlled in recent years than in the past. Nevertheless, the bottom of the bay still retains much of the former pollution and its effects. This

combined with silting, which occurs with increased development, has probably reduced the good spawning areas available for some species.

Various species require different habitats for spawning. Table 18 summarizes spawning characteristics for the principal sport fishing targets in Erie.

Table 18. SPAWNING CHARACTERISTICS SUMMARY, ERIE TARGET SPORT FISHING SPECIES, 1983

<u>Species</u>	<u>Spawning Period</u>	<u>Characteristics of Spawning Area</u>
Smallmouth Bass	May/June	Gravel; 3-4 ft. water depth
Largemouth Bass	May/June	Over aquatic roots on soft Bottoms
Yellow Perch	March	In jelly masses in the water
Walleye	March/April	Rock Shallows
Salmon	Fall	Streams
Steelhead	Spring/Fall	Streams

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Salmon and steelhead typically spawn successfully in streams much larger than those available at Erie. There is virtually no natural reproduction of either of these species and no realistic means of generating suitable spawning habitat.

Largemouth and smallmouth bass both typically spawn in relatively shallow (three to four feet) water in a protected area. Smallmouth spawn over gravel bottoms. Largemouth will occasionally spawn over the gravel also, but will more often spawn over aquatic plants and roots on relatively soft bottoms. Both of these species have been very productive in the bay, suggesting that existing spawning habitat is good, and further enhancements are low priorities.

Walleye typically spawn in late March or early April over rocky shallows. Walleye are rarely found within Presque Isle Bay, suggesting that there are not suitable spawning grounds in the bay. The creation of a rocky bottom in a shallow area of the bay could be helpful in creating a suitable spawning area. This might be an effective means of trying to maintain the stocked walleye populations within the bay.

The creation of a rocky bottom could be achieved by dumping concrete debris from a demolition project into a shallow portion of the lake. The concrete and rock materials could be obtained without cost and labor and equipment rental for the dumping could be accomplished at relatively low cost. A primary consideration is not to destroy other important environmental features in the process. Assistance of Pennsylvania Fish Commission and Gannon University biologists should be sought in selecting an appropriate site.

Target areas for dumping would include the shallow areas between the base of the peninsula and the Erie Yacht Club. Estimated costs would total \$5,000-\$10,000, and additional work could be required every 5 or 10 years. Costs would be approximately \$1,500 per year assuming an expenditure of \$7,500 every five years. The impact on fishing trips could be significant if the walleye population in the bay could be enhanced; however, the potential for success is not strong. This is given medium priority. Similar costs would hold for developing additional gravel bottoms for smallmouth spawning. However, these are a low priority because smallmouth bass are already reproducing.

Artificial Reef Development

The development of artificial reefs, using old tires or junked cars, has been suggested as a means of improving fish populations. These reefs have been very successful in other areas as a means of attracting fish. Typically, they do not directly enhance the overall fish populations, but they can result in a greater congregation of fish around the artificial reef. This is more likely to be successful in a large body of water with few natural features to serve as focal points for the fish.

Presque Isle Bay is not sufficiently large to necessitate artificial reef development within the bay. The development of artificial reefs in the offshore area of the lake can have more of an impact. They should be located close enough to the shore to be located outside of the commercial fishing zone and to provide easy access from shore. A location one-quarter mile from shore would be logical.

Development costs for artificial reefs would be substantial to insure that it remained well anchored during storms, even if inexpensive "junk" materials were used for the reef. A "ballpark" cost estimate is \$100,000 for an artificial reef of sufficient size and strength to be an attractive reef in the lake and to remain intact during bad weather. An additional \$1,000 per year, on the average, would be required for maintenance.

The reefs are primarily important for fish species which are territorial rather than migratory. This would produce benefits in fishing for large and smallmouth bass and some benefits for steelhead trout.

There would not be significant improvements in fishing for yellow perch or walleye. The value of an artificial reef in Erie would be minimal.

Evaluation of Fishing Promotion Efforts

Fishing promotion efforts have traditionally been included as part of the overall tourism promotion for the area, but have not been separately targeted as an important component of the tourist market. In recent years, the success of Salmon in attracting fishermen has supported the development of a charter boat industry. This industry has become increasingly involved in separate fishing promotion activities.

Current fishery promotion activities include:

1. The inclusion of fishing in general Erie promotional materials and companies.
2. Fishing maps available at the Chamber if needed in response to request for fishing information.
3. Participation of charter boat operations in a variety of sportmen's shows in surrounding areas.
4. A recently initiated fishing tournament.
5. Efforts on the part of the Chamber of Commerce and local fishermen to attract and entertain outdoors writers from regional newspapers.

These promotional efforts have been helpful in reminding residents about the fishing opportunities in Erie. Most of the current non-local fishing trips are generated through repeat visits of people who have fished at Erie for years or through word-of-mouth contacts.

General Erie Promotion Activities

The Erie Chamber of Commerce has been the most active organization in promoting area tourism. The "You'll Love Erie" campaign has included the development of promotion brochures and novelty items (hats, tee shirts). The campaign has also included coordination within the advertising themes of local businesses and a Pittsburgh-directed radio advertising program.

The radio advertising program has been targeted at a general audience and so has not been as efficient as possible in promoting fishing. For example, the radio advertising program on WTAE (Pittsburgh) included spots in all the major daytime categories except the evening sports call shows. These sports call shows would be expected to have the highest listening shares among fishermen, who are predominantly male.

The primary focus of the promotion campaign has been to increase Erie's general name recognition as a tourism destination. Specific activities are included as a secondary focus with fishing as one of many activities available.

Response to Information Request

The Erie Chamber typically fills fishing information requests. They have produced a fisherman's map of the county which identifies major access points and the principal fish available in different locations. They can also provide lists of member motels, campgrounds and restaurants.

Fishing-oriented establishments near the public dock also serve as impromptu information centers. Smith's Boat Stand, Regarie's Boat stand, Bayshore Marina, and The Compleat Angler all respond to numerous information requests on places to fish, target species and best methods. On the Peninsula, BAC Bait Shop and the park administration office also serve as informal information centers.

The combination of Chamber information and that provided informally by fishing-oriented businesses is important in helping to meet the needs of tourist fishermen. However, the lack of overall coordination creates information gaps which can result in dissatisfied fishermen.

Each of informal fishing information sources has a network of personal preferences in fishing places, businesses, etc., and may not direct the fishermen to the places which meet his needs best. The Chamber, for example, will refer callers only to member companies. Many of the small motels and campgrounds which serve fishermen are not Chamber members, and are therefore not included in information provided to fishermen. Yet, in some instances, these non-member businesses may best meet the preference of the tourist fishermen. Efforts to include all fishing establishments are important in assuring fishermen's maximum enjoyment of Erie and a return visit.

Much of the current Chamber information is of insufficient detail to be of maximum use to the fishermen, because of the lack of coordination with other groups. The fishing map showing water access areas covers the entire county, but does not show substantial detail on the road access. The lack of direction signs on Routes 5 and 20 makes it difficult for the non-local fisherman to find fishing access.

There is a lack of promotion brochures by independent businesses attempting to "sell" both fishing in Erie and the services offered by the particular business. Ideally, the Chamber could mail a general listing of fishing-oriented businesses and several brochures for individual businesses. These individual brochures should provide detailed information on directions, facilities offered, and cost and would also attempt to convince the tourist that he would enjoy fishing in Erie.

Sportsmen's Shows

One of the principal sources of information and promotion in the sport fishing industry is the outdoors show. Most large cities have an annual outdoors show which provides an opportunity for local fisherman and hunters to make a one-stop "shop" for fishing information. These shows have booths of equipment manufacturers and dealers, charter boat operations, fish lodge operations and area tourist councils. They provide the perfect opportunity for businesses and areas to reach the target audience of fishermen. Local fishermen who are thinking about going fishing in a "new and different" area will come to the show to shop the different booths.

Erie's representation in sportsmen's shows has been principally through the efforts of charter boat captains. At the most recent sportsmen's show in Pittsburgh, booths were rented by Bayshore Marine, Chet Alex and The Northwest Pennsylvania Counties Association. Bayshore is a boat sales and service company which also organizes fishing charters for nine different captains. Chet Alex is both a boat dealer and a charter operator. The Northwest Pennsylvania Counties Association is a tourism organization representing six counties, including Erie.

The boat dealers/charters captains had rented several booths each and had taken a large fishing boat to provide maximum visibility. The booth staff were the charter captains who could provide good detailed answers to any specific fishing questions. On the other hand, The Northwest Pennsylvania Association had only one booth and provided brochures on many different fishing areas. The booth staff was not from Erie and was not able to provide the same kinds of detailed information.

Sportsmen's shows have been used effectively by the charter boat section of the industry to generate increased business. However, the other segments of fishing tourism have not been well represented.

Erie Fishing Tournament

An Erie Salmon Fishing Tournament has been organized and was run for the first time in 1982. The tournament has been sponsored recently by the city and Chamber and has been supported by prizes donated by several local fishing businesses. The tournament is run in conjunction with You'll Love Erie Days, a general tourism promotion festival.

The fishing tournament is an important step in promotion, and its coordination with Love Erie Days is the most effective timing. The success of the tournament is likely to require a several year development period. Attendance and interest is likely to grow each year as long the tournament is both effectively promoted and well organized. An expansion of the tournament to include other species could also help generate growth.

Outdoor Writers

Outdoor writers are typically staff members of major newspapers and magazines who write about fishing, hunting and other outdoor participating sports. They are one of the most effective means of fishing promotion. Several charter boat operations have indicated that an article about fishing in any of the western Pennsylvania papers will generate a substantial increase in information calls and booking in the following week.

Recognizing the power of outdoor writers for promotion, local businesses and the Chamber have made explicit efforts to treat the writers as welcome guests. Good relationships between the Erie fishing community and surrounding area outdoor writers has served the city well. Every effort to continue these relationships and expand the number of writers who will frequent Erie fish spots should be made.

The City of Erie lost an opportunity to house the National Outdoor Writers Convention because of a failure among the fishing community and the city to recognize the importance of the opportunity and to make the necessary changes in business routine to accommodate the special needs of the convention. A special effort should be launched to attract the convention in a future year and to insure that the best possible image is created.

Recommended Fishing Promotion Activities

An array of fishing promotion activities are possible and needed as a means of letting more people know about fishing in Erie and convincing them that fishing in Erie is a great recreation idea even for the novice

fisherman. The first requirement for the promotions program is a coordination staff to arrange the promotional activities and oversee the day-to-day operation. The staff should be connected to a fishing information center which would be set up to respond to any fishing-related information requests.

Staff and Information Center. The principal functions of the fishing information center and staff are to coordinate all promotional and business development activities related to fishing and to provide an information clearinghouse for fishermen visiting Erie. The staff should be headed by a fisheries development coordinator and should include an assistant who would operate the information center and deal with information requests. The information center should be in a prominent fishing-oriented location, preferably on the Public Dock or nearby.

Staff costs would include not only direct salary, but also related fringe benefit and tax costs. The development coordinator salary would be expected to be about \$25,000-\$30,000; an assistants salary would be \$12,000-\$15,000. If fringe benefits and other directly related costs are included, minimum staffing costs would be \$45,000 annually.

Costs for the information center would include either direct or imputed rent for space and the cost of office services (telephone, copying, etc.) and supplies. About 500 square feet is likely to be required. An annual rental utility and miscellaneous rate of \$14 per square foot would generate space costs of \$7,000 annually. Office supplies would be about \$1,000 annually. Office furniture and equipment would represent capital costs of \$7,000. These could be allocated annually to about \$1,000, based on 14 percent interest. Telephone,

copier rental and other equipment costs would add another \$3,000. Total annual equivalent costs are estimated at \$12,000.

Advertising Campaign. One of the initial responsibilities of the fisheries development coordinator is to develop an advertising outreach program designed to make fishing in Erie a more visible choice for fishermen in the Erie market area, primarily Pittsburgh.

The advertising campaign should be designed to increase Erie's name recognition as a tourist destination and to focus on the fishing available. As such, it should run on a year-round basis, although with modest exposure during any given week. Special events should be held in Erie at the beginning of the summer tourism season and at the beginning of the fall salmon season, and these should receive special advertising effort.

A wide variety of media can be included. Printed ads should target the sports pages of the Pittsburgh papers. A 12-column inch display advertisement in the Wednesday Pittsburgh Post Gazette and the Pittsburgh Press costs \$929. An on-going program with ads running weekly during the principal fishing seasons (April-October) and monthly during the winter (November-March) would result in a direct annual advertising cost of \$33,444.

Radio ads can be used to supplement the print ads or as a substitute. WTAE in Pittsburgh has nightly sports-call shows featuring Myron Cope and Stan Savern, which would make an excellent target for the potential fisherman market. Advertising rates for these shows are \$85 per 60-second spot or \$68 for a 30-second spot. A campaign with three spots per week during the April-October fishing season and one spot per

week during the November-March season would cost \$9,600 for 60-second spots, or \$7,700 for 30-second spots.

The Erie Chamber has advertised on WTAE in the past three years. However, their time selections cover all the major day/evening blocks except the sports-call shows, which are the logical focus for sport fishermen.

Advertising for both newspaper and radio provides important complements to each other and should be pursued on a dual basis. The highest priority program would be in the Pittsburgh market which is clearly the greatest potential source of trips. The full estimated annual cost of \$35,000 for newspaper and \$10,000 for radio would be applied.

Youngstown represents another significant market source which has high potential but is currently underutilized. An advertising program in Youngstown is particularly important because it can bring visitors from out of state. It has high potential because Youngstown is not already located on a major body of water and has good access to Erie. Advertising costs in Youngstown would be expected to be significantly less than in Pittsburgh, because of the smaller population base. A radio ad program of \$7,000 and newspaper ads of \$25,000 are reasonable. Youngstown is given medium priority.

Buffalo and Cleveland are major population centers near Erie which can also be targeted for an advertising program. Costs in these markets would be comparable to Pittsburgh. Priority is considered low since these markets have their own accessibility to Lake Erie and attraction is more difficult.

Advertising rates quoted include a 15-percent advertising agency fee. If Erie were to do its own production, the 15 percent would be rebated. A more reasonable approach is to work with a professional advertising agency who would use the 15 percent as its fee.

Direct mail advertising could be very effective as a promotional tool, especially if it were possible to obtain a mailing list of licensed fishermen in Western Pennsylvania and/or Northeast Ohio. Direct mail to 50,000 households would cost \$10,000 in postage and another \$10,000 in pamphlet costs. This would be given medium priority.

Billboard advertising along major routes to the Presque Isle State Park is likely to be an effective way of getting novice fishermen who are visiting the beaches to extend their stays and try fishing. Local radio advertisements may be another way to target the summer weekend tourist crowds.

Print advertisements in major trade magazines such as the Great Lakes Fishermen should be explored as a means of targeting the fisherman market. Advertisements in trade publications should also be used as a means of obtaining greater leverage in assuring sufficient story coverage of Erie fishing and special events in the same trade publications. A budget of \$10,000 for trade magazines is a reasonable complement to the geographic targeted advertising dollars. Since this advertising would focus on the specific target market, it is given a medium priority.

Brochure Production. The principal function of the fishing information center will be to provide information on the facilities and services available for fishing in Erie. An important means of doing

this, while getting across an effective promotional message, is through the use of brochures. An overall information packet on fishing should be put together to discuss in detail the following pieces of fishing information:

- o Directions to the fishing information center from the major markets;
- o A map of the county showing general fishing access points, with detailed inset maps of specific sites;
- o A discussion of the best access points and best fishing locations for specific species;
- o An annotated listing of charter boat operators;
- o An annotated listing of bait dealers;
- o An annotated listing of tackle dealers;
- o An annotated listing of motels and campgrounds;
- o An annotated listing of marinas; and
- o An annotated listing of boat fuel and supply facilities.

The fishing packet should be a colorful folder holding individual brochures on specific fishing businesses. Funds for the brochures on the specific businesses should be solicited directly from the business included. The entire cost of production for the information packet should be covered by funds obtained from the businesses included. Every effort must be made to include as large a share of the available businesses as possible. While the funds for production should come from included businesses, the fisheries development coordinator should have responsibility for organizing, designing and having the brochures produced.

The fishing information center should also provide help and direction for any specific business which is interested in preparing their own brochures. The information center should be used as a point of distribution for the individual company brochures.

Brochure costs for simple three-page fold-outs are estimated at \$1 each for the first thousand and \$0.50 each for more than that. Annual production of one brochure could be 8,000 brochures, or \$4,500. More elaborate multi-colored brochures would be twice the cost. The fisheries development office should initiate brochure productions by developing at least two of its own. This would require annual expenditures of \$9,000 and is considered high priority.

Sportsmen's Shows. Sportsmen's shows are held in most of the large cities around Erie. These shows provide an opportunity for sportsmen in the various cities to visit a show and see what is offered by a wide variety of equipment manufacturers, charter boat operators, hunting and fishing lodge operators, and numerous chambers of commerce. The promotion efforts of Erie should include renting a booth, and preferably two, at each of the sportsmen or boating shows in the cities in its major market area. The booths should be staffed by the fisheries development coordinator and assistant. Large wall-sized promotional graphics should be produced to provide additional booth visibility. A full range of fishing promotional brochures should be available.

The cost of typical booth rentals is \$500 per booth space. Shows in Pittsburgh, Youngstown, Cleveland, Buffalo, and Harrisburg should be covered each year. Total direct booth space costs would be about \$4,000 annually. Additional costs of booth graphics design and production would be about \$500 annually, and transportation and accommodations for

the booth staff would be \$5,000 annually. Total cost of booth operations is estimated at \$9,500 annually.

Signs and Directions. The fisheries development coordinator should have the responsibility of insuring that all fishing access and facilities are clearly marked and so that they are easy to find from the major roads. Road signs should be placed by city or state highway departments at key intersections to insure the non-local fishermen can easily find the fish access and businesses. Costs of the signs is estimated at \$100 per sign. This should be covered either by the streets and highways departments or through contributions of the business which benefit from the signs. The fisheries development office would take over the cost of placing some signs for general use. This could require expenditures of \$2,000.

Directions to the Erie Public Dock and an exit sign on I-79 are extremely important both as a service in providing directions and as an advertising mechanism.

Fishing Tournament. The fishing information center should coordinate with, or take over completely, the sponsoring of an annual fishing tournament. The tournament should have a major kick-off early in the summer season, possibly the week before Memorial Day to avoid conflicts with other activities for the target non-local fishermen. This tournament should concentrate on a principal native specie, such as the perch or walleye, with a variety of prizes available for largest catch in various fishing classes. If possible, the tournament should be coordinated with "We Love Erie" day festivals.

The fishing tournament should be considered an ongoing tournament with prizes every month for the largest fish caught as that month's targets. Targeted fish should include: walleye, perch, smallmouth bass, largemouth bass, muskie, northern pike, coho salmon, chinook salmon, and steelhead trout. Annual prizes should be given for the largest catch in all of these species, in addition to the monthly prize for the largest catch that month for the target species. A grand prize should be awarded for the person catching the greatest combined catch size.

All prizes awarded to non-local residents should be heavily publicized in the area of the winner's residence as a means of generating additional interest in the tournament and in fishing in general.

There should be designated official weigh-in stations in many fishing-related businesses along the waterfront. The weigh-in stations are also the principal sources of prizes and prize money in exchange for the publicity associated with sponsoring the tournament. The fisheries development office could be expected to absorb some of the costs of running the tournament. Total costs of \$5,000 would include additional brochure production to explain the rules and prizes. Advertising would be covered by the previously discussed advertising budget. The fisheries development coordinator would be expected to devote a substantial block of time to the tournament organization. In structuring this tournament, the potential for a winter "ice fishing carnival" component should not be overlooked.

Evaluation of Boat Access

The boat-oriented share of sport fishing produces the greatest economic impacts for the Erie economy. The ability of Erie to attract boat fishermen depends on the access capacity of boat ramps, marinas and rentals. On peak demand days, boat access facilities reach full capacity and additional trips are not possible. On days with near peak demand, long lines form for launch facilities and can leave a negative impression of the Erie fishing experience.

Boat access includes launch ramps, marinas and rental(s). Total capacities are identified for each of the sites, and a general evaluation of facility quality is made. Before evaluating quality and capacity of individual sites, an overall comparison of seasonal demand and total capacity is made.

Total Capacity

Total capacity for boating is indicated by combining marina slips, rental boats and launch ramp capacity. Marinas and rentals are limited by the number of boats which they hold, while launch facilities are limited by available parking for cars and boat trailers. Table 19 lists the boat and person-trip capacities of existing Erie facilities.

Table 19. BOAT ACCESS CAPACITY, LAKE ERIE, PENNSYLVANIA, 1982

<u>Facility Type</u>	<u>Boat Capacity</u>	<u>Trips Capacity</u>
Launch Ramps (Parking)	927	2,781
Marinas Slips	1,709	5,127
Rental Boats	75	285
Total	2,711	8,133

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Total boat capacity at any point in time is estimated at about 2,700 boats. With an average of three people per boat, this supports a total of 8,133 trips. The number of daily trips can be expanded slightly if multiple trips are made in docked boats (marina or rental) or if morning and afternoon trips can be made using the same launch ramp parking capacity. Car top boat launching provides an additional increment of capacity not measured here. These expansions in capacity are minor.

Over 60 percent of existing capacity is in marina slips. Even at peak demand periods, only a modest share of marina boats would be used at the same time. This substantially reduces the area's ability to meet peak trip demands. At peak demand periods, launch ramps and rental boats may be fully utilized, but only about 30 percent of all marina boats are on the water. This produces an effective maximum capacity of 1,515 boats, or 4,545 trips.

Boat Trips

Demand for boat access is partially indicated by the number of boat trips currently being made. To the extent that capacity is a problem,

the current number of trips may underestimate current demand. Table 20 summarizes all boat trips, including fishing and pleasure boating, by season.

Table 20. DISTRIBUTION OF COMBINED FISHING AND PLEASURE BOAT TRIPS BY SEASON, LAKE ERIE, PENNSYLVANIA, JUNE 1981-May 1982

<u>Season</u>	<u>Total Trips</u>		<u>Average Daily Trips</u>	
	<u>Weekend</u>	<u>Weekday</u>	<u>Weekend</u>	<u>Weekday</u>
Winter (Dec-Feb)	0	0	0	0
Spring (March-May)	24,860	16,240	920	250
Summer (June-August)	113,390	105,990	4,200	1,630
Fall (Sept-Nov)	36,690	31,050	1,360	480
Total	174,940	153,280		

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Most boating in the Erie area occurs during the summer, and weekends include more total trips than weekdays. Table 20 shows both total trips by season and the average daily number of trips. Survey data shows that peak use during summer weekends generated an average of 4,200 trips per day. Summer weekdays are the second busiest period, averaging 1,630 daily trips. Data in Table 20 is based on Fish Commission estimates of angler boating trips and our estimates of pleasure boating trips assuming similar trip time lengths for pleasure boaters.

The extent to which boat capacity is a problem is only partially indicated by a comparison of average use over the season and maximum capacity. Peak use occurs during summer weekends, which average 4,200 trips per day. This is 92 percent of the maximum 4,545-trip capacity. The average use includes both times when use is at capacity as well as poor weather days and early season days when use is far below capacity.

Pleasure boating trips are much more affected by weather conditions than are fishing trips. If the average usage is 92 percent of capacity, this suggests an extremely high number of summer weekends are at full capacity. Although the number of "turnaways" has not been estimated, it is substantial. Capacity, therefore, is expected to be a substantial problem.

The fishing component of total boat use is distributed slightly differently than the total. Although spring and fall are the best fishing seasons, fishing in the summer involves more trips as a popular means of enjoying the outdoors for the Presque Isle tourists. Table 21 shows the distribution of fishing-oriented boat trips.

Table 21. DISTRIBUTION OF BOAT ANGLING TRIPS BY SEASON,
LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982

<u>Season</u>	<u>Total Trips</u>		<u>Average Daily Trips</u>	
	<u>Weekend</u>	<u>Weekday</u>	<u>Weekend</u>	<u>Weekday</u>
Winter (Dec-Feb)	0	0	0	0
Spring (March-May)	14,170	9,550	520	150
Summer (June-August)	40,420	41,860	1,500	640
Fall (Sept-Nov)	25,790	22,290	960	350
Total	80,380	73,700		

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Average daily boat fishing trips peak on summer weekends at 1,500 trips. The second most active boat fishing period is fall weekends, which average 960 trips per day. Fishing trips vary substantially from period to period in their share of all boat trips. These shares are shown in Table 22.

Table 22. FISHING SHARE OF TOTAL BOAT USE
LAKE ERIE, PENNSYLVANIA,
JUNE 1981-MAY 1982

<u>Season</u>	<u>Weekend</u>	<u>Weekday</u>
Winter	N/A	N/A
Spring	57%	59%
Summer	36%	39%
Fall	70%	72%
Total	46%	48%

Note: N/A is not available.

Source: Pennsylvania Fish Commission
 survey and Hammer, Siler, George
 Associates.

Fishing trips account for a high of 72 percent of all boat trips during weekdays in the fall, corresponding to the salmon runs. The low share occurs on summer weekends when only 36 percent of boat trips are made for fishing.

Capacity problems are difficult to assess on an "overall average" basis. Substantial variations occur in the different type of facilities and at various locations. Launch ramp facilities tend to have a higher concentration of fishing use than marinas. Typically large boats are used mostly for pleasure boating, while small boats are used for fishing. Small boats are easier to trailer to good fishing locations and must rely on launch ramp capacity. Larger boats are difficult to trailer and so are generally kept in marina space. A discussion of the various type of facilities and quality of each follows.

Launch Ramp Facilities

Launch ramps are an important component of boat anglers' access to Erie's waters for fishing. Many of the existing launch facilities are in poor condition or were designed poorly, causing potential danger to boats and even lives if a sudden storm makes it desirable for many boats to leave the water simultaneously. In addition, at peak periods crowding at the good quality launch facilities is severe. Existing launch ramps are identified in Table 23 and evaluated according to quality and capacity.

Table 23. INVENTORY OF BOAT LAUNCH AREA CAPACITY,
ERIE COUNTY, 1981-1982

<u>Launch Area</u>	<u>Parking Capacity</u>	<u>Quality Rating</u>	<u>Ownership</u>
<u>West End</u>			
Raccoon Creek	20	Poor	Public
Virginia Beach	35	Fair	Private
Elk Creek	50	Poor	Private
Walnut Creek	265	V. Good	Public
Subtotal	370		
<u>Presque Isle</u>			
West Point	18	Good	Public
Niagara Boat Ramp	37	Good	Public
Presque Isle Marina	50	V. Good	Public
Lagoons Ramp 1	18	Good	Public
Lagoons Ramp 2	45	Good	Public
Subtotal	168		
<u>Erie Bay Front</u>			
Camp Perry Ramp	35	Fair	Public
Chestnut Street	40	Good	Public
Waterworks	50	Fair	Public
Erie Outboard Club	35	Fair	Private
Subtotal	160		
<u>East End</u>			
Lamp Marina	54	V. Good	Public
East Avenue	60	Fair	Public
Shades Beach	40	Poor	Public
Twelve Mile Creek	25	Poor	Public
Northeast Township	50	Fair	Public
Subtotal	229		
Total	927		

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 23 shows that existing launch ramps have parking capacity to hold 927 cars with trailers. Since convenient parking is necessary to use a launch facility, this is used as maximum capacity for any point in

time. This capacity estimate may actually be high since boat fishermen will compete with shore fishermen for available parking at many locations.

Only three facilities are considered to be of very good quality: Walnut Creek, Lampe Marina and Presque Isle Marina. Other facilities of good quality include all the launch facilities at Presque Isle State Park and the Chestnut and Waterworks ramps on the Erie Bayfront. While the Chestnut and Waterworks facilities themselves are of reasonably good quality, the road access to the facilities is poor. The "very good" and "good" quality facilities combine for a capacity of 527 boats, or 57 percent of the total capacity. All of the good quality ramp capacity is publicly accessible without user fees. Quality ratings are our subjective judgments based on site visits. Comments from some fishermen were also obtained to help in making the judgments.

With crowding at good ramps, fair and poor quality ramps are forced into use during peak periods. The poor quality ramps pose some danger to the boat from launching directly into the lake or using ramps which are deteriorating.

One indication of the extent to which facilities are operating near realistic capacities is given by comparing the peak monthly use with adjusted monthly capacity. This is shown in Table 24 on the following page.

Table 24. LAUNCH RAMP CAPACITY AND USE, LAKE ERIE, PENNSYLVANIA,
June 1981-May 1982

<u>Launch Ramp</u>	<u>Adjusted Monthly Trip Capacity</u>	<u>Peak Month</u>		<u>Total Fishing Trips</u>	<u>Share of Hours For Angling</u>
		<u>Trips</u>	<u>Month</u>		
<u>West End</u>					
Raccoon Creek	1,000	300	August	580	58%
Virginia Beach	1,750	970	July	2,270	78%
Elk Creek	2,500	1,670	Sept	5,230	92%
Walnut Creek	13,250	8,240	July	33,300	87%
Subtotal	<u>18,500</u>				
<u>Presque Isle</u>					
West Point	900	870	May	4,390	67%
Niagara Boat Ramp	1,850	1,290	Sept	5,470	39%
Presque Isle Marina	2,500	3,230	May	13,480	49%
Lagoons Ramp 1 & 2	3,150	4,680	May	13,170	76%
Subtotal	<u>8,400</u>				
<u>Erie Bay Front</u>					
Commodore Perry Ramp	1,750	1/		1/	
Chestnut Street	2,000	1/		1/	
Waterworks	2,500	1/		1/	
Erie Outboard Club	1,750	1/		1/	
Subtotal	<u>8,000</u>	910	May	13,800	32%
<u>East Lake</u>					
Lamp Marina	2,700	920	July	3,500	35%
East Avenue	3,000	2,390	July	7,200	78%
Shades Beach	2,000	-	-	0	0%
Twelve Mile Creek	1,250	1,700	July	3,600	92%
Northeast Township	2,500	1,140	July	3,330	77%
Subtotal	<u>11,450</u>				
Total	46,350				

1/ Not available separately.

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Adjusted monthly capacity assumes that an average of three people will use each boat and that all available spaces will be used on weekends. Weekdays typically have only 40 percent of weekend use, so the total monthly capacity reflects this lower weekday use level. Poor weather was not used to limit the capacity measure.

Table 24 shows that existing launch capacity is dramatically higher at Walnut Creek than at any other facility. Total annual fishing trips are more than double the number at any other site. Peak month trips are somewhat below the adjusted monthly capacity at Walnut Creek. This is primarily a result of the sensitivity of boaters to using the lake under bad or even potentially bad weather conditions. On good weather weekends Walnut Creek is typically at capacity.

The greatest use of existing capacity occurs at the Presque Isle facilities. Five ramps are available in the state park generating an adjusted monthly capacity of 8,400 trips. Weekday use of these facilities is substantially greater than the 40 percent average, so per month trips exceed adjusted capacity at the Presque Isle Marina ramp and at the two Lagoons ramps. The state park is operating at a very high capacity level because of the good quality provided in the launch facilities and road access to the facilities. These ramps serve fishermen on the bay which is less affected by poor weather. In addition, many fishermen who plan on using the lake will switch to the bay if weather conditions are not good.

Erie Bayfront facilities provide the least boat launch capacity and also have the fewest trips. These facilities provide access to the Bay and should have strong demand. However, the launch facilities

themselves are generally only of fair quality, and the road access to most is extremely difficult for cars with a boat in tow.

The East Lake area has reasonable parking capacities at its launch facilities, but the launch facilities themselves are poor and use is low. The best facility on the East Lake area is the Lampe Marina, which has both good facilities and access. The Lampe Marina has a relatively high share of use by pleasure boaters rather than fishermen, many of whom use it as a substitute access point for the bay.

Many of the fishing trips are made close to shore near the East Avenue ramp, and this ramp has the greatest fishing trip use among those in the east lake area, in spite of its poor condition.

Boat Ramp Development Actions

Boat access development has two principal components. First, the quality of available facilities should be upgraded to make the facilities themselves an attraction to generate additional fishing interest in Erie. Second, the capacity of boat access should be expanded to allow more fishermen to use the lake at peak periods of demand.

The first improvement needed in boat ramp capacity is upgrading existing ramps to insure that use is safe for boats and that launching can be accomplished quickly and easily. The ramps which have the greatest potential for increasing trips if upgraded are on the Erie Bayfront. These ramps are not used to their capacity, while the good quality ramps in the state park are often at their maximum capacities. Upgrading is needed at the ramp beside the Commodore Perry Yacht Club

and at the Waterworks ramp. The recent upgrading at the Chestnut Street ramp is a good example of the level of upgrading needed.

In addition to improvements in the ramps themselves, other associated improvements are also needed. The road access to these facilities is poor and virtually unmarked. Non-local fishermen have to be told how to find the improved launch facilities, and the road access has to be reasonably good. The bayfront access road is the ideal solution to the access problems of these ramps. However, until that road is closer to actual development, upgrading of the existing streets should be planned.

The cost of upgrading existing ramps will be close to the normal construction costs of new ramps. Principal costs savings will be realized in site development costs. Upgrading of the ramps would be expected to cost about \$10,000 if contracted. To the extent that existing public employees could be used for the construction upgrading, the development costs could be reduced. Priority of ramp upgrading is high because most boat access for fishing is from ramps.

Upgrading of the East Avenue Ramp is another low-cost; high-impact project. This is one of the few sites in the East Lake area which has some natural protection from the direct winds of the lake.

Upgrading at sites in the East and West lake areas will require more than just ramp and parking reconstruction. The principal need in these areas is for breakwater protection from the choppy lake on windy days. This protection is easiest at the mouths of creeks or streams, but costs are still likely to be high.

An access development project has been started at Elk Creek with land acquisition, road development and parking facilities already funded. The development of a new launch ramp facility was budgeted at \$30,700 in 1980 dollars, which is likely to be about \$37,700 in 1983 dollars. The most expensive items are those related to channel improvements. Total channel improvements were budgeted at \$253,400 in 1980 dollars, with a 500 linear foot gabion breakwater accounting for \$180,000. In 1983 dollars, costs are likely to be \$221,000 for the breakwall and \$312,000 total. The ramp and channel improvements combined will cost about \$350,000. At a 14-percent interest rate, the annual cost is \$49,000. This is given high priority since it represents the completion of a project already underway and will support both boat and shore fishing.

Similar costs could be expected at other sites along the east and west lake areas with equivalent breakwall development. In the east lake area, the need for a "safe harbor" between Erie and Dunkirk, New York has often been discussed. Sites for a launch ramp with a breakwall could include Northeast, Pennsylvania or Shades Beach. Costs for the launch area with breakwall protection would be comparable to Elk Creek. Priority is listed at medium since the east lake area has less fishing pressure than the west.

Marina Facilities

Marina facilities provide lake and bay access for 2,207 boats, most of which is used at least occasionally for fishing. Marinas are an important component in the overall boat access. Table 25 lists marina facilities and capacity and evaluates their quality.

Table 25. INVENTORY OF MARINAS, ERIE COUNTY, 1981-1982

<u>Launch Area</u>	<u>Number of Slips</u>	<u>Quality Rating</u>	<u>Ownership</u>
<u>West End</u>			
ETk Creek	73	Poor	Private
Walnut Creek	72	V. Good	Public
Subtotal	<u>145</u>		
<u>Presque Isle</u>			
Presque Isle Marina	498	V. Good	Public
<u>Erie Bay Front</u>			
Erie Yacht Club	439	V. Good	Private
Commodore Perry Y.C.	139	Good	Private
Cherry Street	240	Good	Private
Bob's Wharf	30	Poor	Private
Presque Isle Y.C.	90	Fair	Private
Gem City	38	Fair	Private
Paasch Marina	8	Fair	Private
West State Street <u>2/</u>	54	Fair	Mixed
Erie Marine	60	Fair	Private
Brockway	100	Fair	Private
East State Street	8	Fair	Private
McAllister	70	Fair	Private
Bayshore	75 <u>1/</u>	Fair	Private
Subtotal	<u>1,351</u>		
<u>East End</u>			
Lampe Marina	115 <u>3/</u>	V. Good	Public
Lawrence Park Club	55	Fair	Private
Freeport Yacht Club	28	Fair	Private
Charlies Boat	15	Fair	Private
Subtotal	<u>213</u>		
Total	2,207		

1/ Trips allocated between ramps and marina slips.

2/ Includes Lund and Hidden Harbor.

3/ Capacity has since been increased to 250 slips.

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

The best quality marinas are Walnut Creek in the West Lake area, Presque Isle marina in the state park, the Yacht Club on the Erie Bayfront and the Lampe Marina in the East Lake area. The Erie Yacht Club is the only private facility among this group. It and the Presque Isle Marina are much larger than any other area marina.

Most area marinas are of fair quality, providing the essentials in dock space and access to the water -- but little else. Many have difficult road access due to generally poor bayfront access roads. Fishing trip use of the marinas is often proportionately higher in those with a high share of smaller and less expensive boats. In general, fishing use is a lower share of total boat use in marinas than it is for launch ramps. Marinas often have a high pleasure boating component. Table 26 shows marina use for fishing.

Table 26. MARINA FISHING CAPACITY AND USE, LAKE ERIE, PENNSYLVANIA

	<u>Adjusted Monthly Trip Capacity</u>	<u>Total Fishing Trips</u>	<u>Peak Month Fishing Trips</u>	<u>Month</u>
<u>West End</u>				
Etik Creek	3,650	7,630	2,410	Sept
Walnut Creek	3,600	9,040	2,240	July
Subtotal	<u>7,250</u>	<u>16,670</u>		
<u>Presque Isle</u>				
Presque Isle Marina	24,900	4,490	1,210	Sept
<u>Erie Bay Front</u>				
Erie Yacht Club	21,950	1,410	370	May
Other West Bayfront	20,450	9,920	2,320 ^{1/}	May
Dock Area	25,150	9,550	2,360	Sept
Subtotal	<u>67,550</u>	<u>20,880</u>		
<u>East End</u>				
Lampe Marina	5,750	7,440	1,950 ^{1/}	July
Lawrence Park Club	2,750	250	100	July
Freeport Yacht Club	1,400	650	230	July
Charlies Boat	750	3,390 ^{1/}	230	July
Subtotal	<u>10,650</u>	<u>11,730</u>		
Total	110,350	37,100		

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Marina peak month use is typically well below potential capacity, often only 10 percent of capacity. One reason is that marinas are often more oriented to pleasure boaters than anglers. However, the most important reason is that the capacity of a marina slip is only available to the slip renter. If that renter does not want to make a boating or fishing trip on a peak demand day, the slip is not available for those that do want to make a trip. This contrasts to the launch ramp capacity, which has no such limitation.

The exceptions to the general rule of low fishing trips relative to capacity is at Elk Creek and Walnut Creek. The marina slips in these areas generate a relatively high number of fishing trips in comparison to their total capacity.

Overall, marinas generate fewer fishing trips than do launch ramps. Therefore, their availability and quality, while limited, are not as important a constraint on fishing as ramp quality.

Marina Development Actions

Additional marina slips are being developed at the Lampe Marina by the Port Authority to meet existing demand for slips. While substantial additional demand exists for marina slips, most is related to pleasure boating rather than for fishing. Because this is already programmed, it is not included in our assessment of potential actions.

Lampe Marina expansion is currently underway as is private marina development at Trout Run. Development costs for a new marina are significantly more expensive than expansions because of the initial infrastructure costs.

Development of up to 1,000 additional slips had been proposed at the state park. This project has been put on hold because of lack of funding within the state park system. The expansion at Presque Isle Marina was planned in 1978, for two phases of 500 slips each (there are an existing 498 slips). Construction costs for the boat slips including piers were estimated at \$3,000 per slip in 1978 dollars and would be \$3,500 in 1983 dollars. For a unit of 500 slips, this would total \$1,750,000. Additional costs for road access and parking and support

facilities such as launch-ramps, washhouses and a travel unit would double the direct cost to \$3,500,000. At a 14-percent borrowing constant this would require \$490,000 per year for the first 500-unit expansion. The income generated by the existing marina only covers operating and maintenance expenses. It is expected that little revenue would be available to amortize the debt service on a new public marina facility.

With the high cost of construction and limited fishing use, marina development at Presque Isle is rated as a low priority. With the recent expansion of bayfront marina space at the Cherry Street Marina and at Lampe, no other projects are recommended for the fisheries program. It is noted, however, that additional marina development may be important for other aspects of economic development such as second-home projects.

Shore Access Evaluation

Shore fishing accounts for the largest number of fishing trips and is an extremely important to the sport-fishing industry. An evaluation of the shore fishing access must include both the capacity of existing access relative to demand (crowding) and the quality of facilities. The crowding of existing capacity is strongly related to the extent to which shore fishing interest "peaks" at particular days and times of the year. Table 27 summarizes shore fishing activity by season and period of the week.

Table 27. SHORE FISHING TRIP DISTRIBUTION BY SEASON, LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982

<u>Season</u>	<u>Total Trips</u>		<u>Average Daily Trips</u>	
	<u>Weekend</u>	<u>Weekday</u>	<u>Weekend</u>	<u>Weekday</u>
Winter (Dec.-Feb.)	1,240	1,940	50	30
Spring (March-May)	27,490	40,540	1,020	620
Summer (June-Aug.)	30,020	50,970	1,110	780
Fall (Sept.-Nov.)	<u>58,270</u>	<u>82,950</u>	<u>2,160</u>	<u>1,300</u>
Total/Average	117,020	176,400	1,090	680

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table 27 shows that in the fall there are an average of 2,160 shore fishing trips per day on a weekend and 1,300 during the week. This is a substantially higher average than during the summer, and is greatest in those areas serving the fall salmon fishermen. Erie offers a wide variety of shore fishing access, but a few areas account for the greatest number of trips. Table 28 shows the inventory of shore access points on the lake and bay.

Table 28. INVENTORY OF SHORE FISHING SITES, CAPACITY AND USE,
ERIE COUNTY, 1981-1982

<u>Shore Site</u>	<u>Quality Rating</u>	<u>Ownership</u>	<u>Fishing Trips</u>	<u>Maximum Monthly</u>	<u>Ice Fishing Trips</u>
<u>West End</u>					
Raccoon Creek	Poor	Public	1,330	630 (5)	0
Eagley Road	Fair	Public	80	20 (9)	0
Crooked Creek	Poor	Private	580	160 (7)	0
Elk Creek	Fair	Private	25,390	10,220 (10)	0
Godfrey Run	Poor	Private	3,950	1,800 (10)	60
Trout Run	Fair	Public	41,420	27,140 (10)	290
Walnut Creek	V. Good	Public	52,830	21,210 (9)	20
Hanseis Bait	Fair	Private	1,420	420 (6)	0
Subtotal			<u>127,000</u>	<u>58,160 (10)</u>	<u>370</u>
<u>Presque Isle</u>					
West Point	Fair	Public	3,200	980 (5)	2,290
Swan Cove	Fair	Public	5,450	1,560 (5)	160
Niagara Ramp	Fair	Public	760	288 (8)	1,210
Presque Isle Marina	Fair	Public	4,740	1,270 (6)	60
Marina Ramp	Fair	Public	160	40 (9)	10
West & East Piers	V. Good	Public	20,290	4,380 (5)	290
Long/Duck Ponds	Good	Public	5,440	1,650 (4)	0
Big Pond	Fair	Public	500	260 (8)	0
Crystal Point	Good	Public	2,710	950 (5)	90
Lagoon's Ramp	Good	Public	16,770	4,140 (6)	7,550
Horseshore Pond	Good	Public	1,830	970 (5)	1,540
Subtotal			<u>61,850</u>	<u>(5)</u>	<u>(5)</u>
<u>Erie Bay Front</u>					
Erie Yacht Club	Fair	Private	1,000	300 (6)	120
Waterworks Ramp	Fair	Public	2,930	710 (10)	350
Public Dock	V. Good	Public	46,750	7,820 (8)	6,280
West State Street	V. Good	Public			
North & South Piers	V. Good	Public	33,760	8,600 (5)	0
Subtotal			<u>84,440</u>	<u>(5)</u>	<u>(5)</u>
<u>East End</u>					
Lampe Marina	Good	Public	180	40 (7)	0
East Avenue	Fair	Public	2,690	830 (5)	0
Four Mile Creek	Poor	Private	370	110 (5)	0
Shades Beach	Poor	Public	200	70 (6)	0

Table 28. INVENTORY OF SHORE FISHING SITES, CAPACITY AND USE,
ERIE COUNTY, 1981-1982 (Continued)

<u>Shore Site</u>	<u>Quality Rating</u>	<u>Ownership</u>	<u>Fishing Trips</u>	<u>Maximum Monthly</u>	<u>Ice Fishing Trips</u>
Twelve Mile Creek	Poor	Public	1,350	400 (9)	0
Sixteen Mile Creek	Fair	Public	9,350	6,350(10)	0
Charlies Boat	Fair	Private	980	530(10)	0
N.E. Township	Poor	Public	20	20 (6)	0
Twenty Mile Creek	Good		4,970	2,130(10)	0
Subtotal			24,450	9,690(10)	0
Total			293,420	77,890(10)	32,590

1/ Number in parenthesis indicates peak month (i.e. (5) is May)

Sources: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Shore fishing access points have been divided into four general areas: west lake, Presque Isle, Erie bayfront, and east end. The west and east lake areas face directly on to Lake Erie. Due to the topography and fishing conditions, almost all of the shore activity on the lake itself is at the mouths of streams and creeks. The Erie bayfront and Presque Isle areas provide fishing access to Presque Isle Bay. Presque Isle State Park sites have been separated from the city's bayfront.

The largest number of shore fishing trips occur in the bay, but the total bay trips are split between the Erie bayfront (84,000 trips) and Presque Isle Park (62,000 trips). The second largest number of shore trips are in the west lake area. Almost half of the total 127,000 trips in this area are made during October, the height of the Salmon runs. The east lake area has relatively few trips, totalling only 24,000.

The distribution of trips is based on both the quality of fishing and access. The greatest single use site is Walnut Creek with 53,800 annual trips. Walnut Creek benefits from excellent salmon run fishing, and also provides good access at the channel piers, substantial parking and good road access. Elk Creek, with equivalent fishing quality but no quality piers and only private parking for a fee, generates only 25,400 annual trips.

Shore fishing tends to be best near channels, stream mouths, or places with good cover. The best shore fishing is currently found at the following places (in rank order):

Walnut Creek
Public Dock
Trout Run
North & South Piers at Bay Entrance
Elk Creek
East & West Piers at Lagoons Entrance
Lagoons Boat Ramp

Walnut Creek. Walnut Creek is a fish commission facility providing boat ramps and marina ships with an improved channel along Walnut Creek near its entrance to Lake Erie. Walnut Creek is one of the larger streams emptying into the lake and also is one of the locations for the salmonid stocking. It offers superior fishing during the fall salmon runs. It has substantial parking facilities for both cars alone (about 80 spaces) and cars with trailers (265 spaces). The pier along the improved stream channel provides a convenient fishing location. The road access to the site is paved and offers no particular obstacle or difficulty.

Public Dock Area. Shore access at the public dock area includes the dock itself, the East and West Slips and the West Side of State

Street. The public dock serves a variety of uses in addition to fishing. Road access is excellent and parking is available both on the dock and along State Street. Fishing occurs along the main dock pier and from the retaining walls of the East and West Arms. In addition, a special fishing pier has been constructed with access from the west side of State Street, near the Flagship Niagara.

Trout Run. Trout Run is another principal salmon run location. Much of the fishing in recent seasons has been within an unfinished private marina. The completion of the marina is likely to reduce the overall accessibility of this location. Road access and parking are good, but once the marina piers are put into use as marinas, there will be competition between the boat and shore fishermen for available parking.

North and South Piers. The north and south piers form the edges of the channel connecting Presque Isle Bay with the lake. Both sides of the channel have long flat surfaces which are ideal for fishing in the deep waters of the channel. Good parking facilities are nearby without competition from boaters, making this one of the better shore fishing areas available. A wide variety of fish is caught here virtually year round. The peak month is May, which accounts for about 25 percent of total trips. The extended season suggests far fewer peak capacity problems.

Elk Creek. Elk Creek is another of the popular Salmon fishing locations. Its peak month, October, accounts for 10,220 of the annual 25,390 trips, or 40 percent. During salmon season, crowding is often a problem.

Elk Creek has a private shore-fishing area available and heavily used on the eastern side of the creek. A public development on the west side is currently under construction, but will require additional funds for completion. The private area has an access road which is partially paved and partially gravel. Modest fees are charged to fishermen for parking and entrance during salmon season, and additional facilities such as "port-o-johns" are provided. The shore access is not highly developed, and shore fishermen typically wade into the surf for fishing. The proposed improvements to serve the west side of the creek would include channel improvements and a boat launch facility. The channel improvements would also allow shore fishing without wading.

East and West Piers. The east and west piers are at the entrance of the marina development at Presque Isle State Park. Like the north and south piers, these provide easy access to relatively deep channel water and are very good for fishing. Parking facilities are reasonably close, but peak summer use of the park sometimes causes crowding problems. May is the peak month of use, but accounts for only 21 percent of the annual use.

Lagoons Ramp. Lagoons Boat Ramp Fishing is located in Presque Isle State Park at the lagoons. Fishing in this area is evenly spread over most of the fishing season. The peak month is June, which accounts for 25 percent of annual trips.

Shore Access Development

More access areas are needed to improve shore fishing. This would also serve to make the waterfront a more attractive area for visiting in general. Shore fishing access is provided in several forms: fishing

pier development, fishing from the waters edge where the depth is sufficient to support fishing; and access to wading areas.

Shore access typically is more flexible than boat access, and capacity constraints have been less of a problem. The peak shore demands have occurred in the West Lake area near the mouths of salmon-run streams during the fall season. The shore access provided by the channel improvements at Walnut Creek have supported a substantial number of fishing trips. The development of similar quality shore access in connection with the Elk Creek development project would be expected to generate a similar number of fishing trips. To the extent that the additional capacity for shore salmon fishing at Elk Creek relieved the oppressive crowding at other access areas, it would improve the general attractiveness of Erie fishing and increase the total number of trips. In the case of Elk Creek, the shore access would be developed coincidental to development of channel improvements for the boat launch area at little additional cost.

Fishing Pier Development

The development of additional fishing piers at popular locations in the bay and at stream mouths can make fishing in the Erie area more attractive by expanding the variety of access points. When the fish are not biting in one location, they may be biting in another. The more access points available for shore fishing, the greater are the chances that fishing will be successful. The different shore access points should also allow the targeting of a greater variety of fish species.

Fishing pier development is important because it lets fishermen have shore access to water which is deeper than normally available from

shore. Additional piers are suggested at the State Park at Dock #2 (behind the administration building) and Misery Bay. These areas already have reasonably accessible parking areas. Construction of "U" shaped piers which extend 20 feet into the water would provide sufficient depth for fishing and allow sufficient space for fishermen enjoyment.

Total construction costs for piers extending into the bay are estimated at \$10,000. Actual costs can vary significantly based on the topography and soil conditions at the pier. Annual costs at a 14-percent bond amortization constant would be \$1,400. Annual maintenance would increase the total annual cost to \$1,600. Total annual costs for sites on the lake would be about 50 percent higher, or \$2,400 annually.

Development of additional piers in the bay is given medium priority because existing shore access is only occasionally crowded. Fishing pier development at Elk Creek is a high priority item since it would help expand the west lake salmon season capacity which is the most crowded. East lake piers are given low priority because of minimal fishing pressure. A pier near United Refining is also given a low priority relative to other locations in the bayfront which are closer to the heart of the city.

Shoreline Improvements

Fishing access along the Erie Bayfront is currently limited because the water depth near the shore line is only one or two feet. Development of retaining walls and filling using materials dredged from the harbor channels would allow a more "finished" shoreline. This would permit fishing from the shore in water of greater depths. This could be

accomplished without substantial cost if the Corps of Engineers could be persuaded to shift from filling the existing dump area to infilling the shore area. A breakwater or retaining wall along 3,000 feet of shoreline between cascade docks and the Chestnut Street pool would cost \$300 per foot, or \$900,000.

If this were financed at a 14-percent constant, the annual cost would be \$126,000. This would be a medium priority at that cost level, but would be a high priority if the Corps of Engineers absorbed the full costs.

Business Services: Evaluation and Potential Actions

Road and equipment rental, charter boats and other business services provided to the tourist fishermen are important to the enjoyment of area fishing. Many of the tourist fishermen in Erie are novices, or occasional fishermen, who are in Erie with their families for a general vacation. Provision of fishing business services make it easy and enjoyable for the tourist to fish. In many popular resort and fishing areas, private fishing piers and other means of access supported by admission fees are an acceptable and desirable means of promoting fishing.

Private business participation in the tourist fishing effort is less well developed in Erie. Charter boat services are readily available and boat rentals are available at Stefans on Presque Isle and Charlies boat livery near Northeast, Pennsylvania. However, the number of boats available is limited, relative to potential demands. The Presque Isle boat livery is primarily oriented to a pleasure boating market. Equipment rental for fishing is virtually non-existent.

Fishing access facilities made available privately for a fee through membership clubs cater primarily to local residents rather than to the potential tourist fisherman.

Fishing-related business services are important for the Erie tourist fishing industry in several ways. First, the services make it possible for many tourists to try fishing by eliminating the problems of lack of equipment or access. Second, quality fishing services can make a tourist fishing trip more enjoyable and help insure a return trip. Third, business services are important in assuring that the local economy achieves the greatest possible economic benefits from the tourist fishing industry.

Charter Boats. The charter boat captains have played an important role in recent years. Charter boats make it possible for residents of the Erie fishing market area to try deep water salmon fishing. Salmon have a special appeal to most Pennsylvania fishermen because of their large size. To many fishermen, the "elbow-to-elbow" salmon fishing in the fall is unappealing, and downrigger charters provide a perfect substitute. The expense of the charter is more than offset by the thrill of deep water salmon fishing for these fishermen.

Charter boat operators have increased in number from three or four in 1980 to about 12 in 1982, and continued growth in the number of operators is expected. The charter boat operators have been creating their own markets as their numbers have increased. Promotional activities such as boat shows and brochures have been used to convince Pittsburghers and others to try an Erie charter boat. The same concept can be applied to other aspects of the fishing service industry, and similar results can be achieved.

Party Boats. Most Erie fishermen are familiar with the old blue pike party or "head" boats. These were large boats holding upwards of 25-30 people which would go out on the lake to fish primarily for blue pike. They were referred to as head boats because the users paid a per person, or per head, price. This contrasts with the charter boats which charge a price for the boat, regardless of the number of fishermen. Currently, party boat services are extremely limited. Initiation of new party boat services should be pursued. These services can be provided on a profitable basis and would not require any city financial support.

Pan Fish Charter Service. Charter services specializing in pan fishing in the bay would provide a valuable complement to the existing downrigger charter industry. The panfishing charter service would include both larger party or head boats as well as the smaller boats which can be chartered by a group of friends. The panfishing charters would have to rent for substantially less than the downriggers, on a per person basis. However, the trip lengths could be shorter and a larger number of trips could be run per day. This service would cater to the novice or first time fisherman, and also to the boatless fisherman. Panfishing charter services would also be expected to operate profitably without financial support from the city. These activities should be initiated by the fishery development coordinator and can be organized from the fishing information center.

Fishing Guide Services

The fishing information center could act as a referral center for individual fishing guides. These guides would perform many of the same functions as the charter boats but would not necessarily provide the boat. The guides could be used to introduce a novice fisherman to

largemouth bass fishing in the lagoons of Presque Isle in waders or could direct the out-of-towner with his own boat to the best fishing spots in the bay and lake.

Ideally, these guides would be introducing the novice or non-local fishermen to Erie and would serve as Erie's "fishing ambassadors." As such, they would have to be carefully screened by the fishing information center. However, a good fishing guide could help insure that the novice fishermen will come back to Erie many times for fishing. In the process, a fishing guide fee would be another means of increasing the economic benefits to the area economy. This service would also not involve costs to the city and as such should be a high priority.

Ice Fishing Services. Ice fishing services are not currently available in Erie. Other ice fishing areas have developed shed rental business. Some groups even sponsor "Ice Fishing Safaris" for the those who have never fished through the ice.

An ice fishing safari would be another way that novice fishermen can be introduced to fishing in Erie. The safari would target those who have never tried ice fishing and want an "adventure" to tell their friends back home about. The safari would include taking a group out to ice fishing sheds in the bay, drilling the ice fishing hole and providing "how to" instructions.

Boat and Equipment Rental. Current boat rental services are limited. There are only two facilities in the county for rentals: Charlies boat livery in Northeast and Stefans at the State park. Neither of these operations provides fishing tackle for rent with the boats. While Charlies has a substantial fishing orientation for the

boats which it rents, Steffans is primarily geared to the pleasure boater. Additional boat and equipment rental services should be provided.

Boat rental services have not been more popular, primarily because of high insurance costs associated with the rentals. The city, working through the Fishing Information Center, should promote additional boat and equipment rentals as a means of promoting additional tourist trips. Rentals are likely to operate at a loss in initial years, but as increases in trips occur the rentals should reach breakeven. A set aside for annual deficits should be budgeted. Since this is not likely to be immediately profitable, it is ranked as medium priority.

Fish Cleaning, Fileting and Packing. A fish cleaning, scaling, and fileting service can be provided for those fishermen who do not want to clean their own fish and those novices who do not know how. Attempts to find retail fish outlets willing to provide these services should be made. Should no local merchant be interested, then the city might organize summer students to provide the service. Charges of 90 cents per pound with a minimum charge of \$3 would be reasonable. Initial operation could run at a deficit, but this service is likely to become increasingly popular and would eventually be profitable.

Salmon smoking services should also be provided, again with a preference for private businesses separate from the city, but with referral from the Fishing Information Center.

Other Competitive Factors

Previous paragraphs have identified many of the competitive factors over which Erie and its residents have some control. There are several other competitive factors which have an important impact on the total share of the fishing market captured by Erie, but which cannot be easily controlled by the city. The most important of these are travel time and environmental amenities.

Travel time is a significant factor which can support the Erie fishing economy. The close proximity of Pittsburgh makes it much easier for Erie to attract Pittsburgh residents, because their travel time and costs could escalate substantially if they were to search out a fishing location with a comparable mix of fish species.

Environmental amenities are another important factor in a fisherman's decision on where to fish, over which Erie has little control. Many fishermen like to be off by themselves in a quiet stream area or lake area to enjoy fishing. These people would be unlikely to choose Erie's busy bayshore as a target fishing area. Nevertheless, a substantial portion of the market is willing to put up with a more crowded or active fishing area if it provides the quality of fish populations they want.

Summary

This section has outlined a wide variety of possible development actions with a range of costs. Table 29 lists the various development actions and their costs. Capital costs are converted into annual costs assuming a 14-percent annual debt service cost. Priority levels are assigned based on expected increases in fishing trips.

Table 29. SUMMARY OF POTENTIAL DEVELOPMENT ACTIONS, ERIE, 1983

<u>Proposed Action</u>	<u>Annual Costs</u>			<u>Total</u>
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
<u>Population Development</u>				
<u>Stocking Programs</u>				
Additional Coho		\$ 86,000		\$ 86,000
Additional Chinook		79,000		79,000
Additional Steelhead	\$ 19,000			19,000
Walleye			\$1,150,000	1,150,000
Yellow Perch (\$2,600,000)				-
Smallmouth Bass			611,000	611,000
<u>Spawning Habitat</u>				
Rock Shallows(Walleye)		8,000		8,000
Gravel Bed (Smallmouth)			1,500	1,500
Artificial Reefs			15,000	15,000
Subtotal Populations	\$ 19,000	\$173,000	\$1,777,500	\$1,969,500
<u>Promotion/Information</u>				
Staffing	\$ 45,000			\$ 45,000
Information Center	12,000			12,000
<u>Advertising</u>				
<u>Newspaper</u>				
Pittsburgh	35,000			35,000
Youngstown		\$25,000		25,000
Cleveland			\$35,000	35,000
Buffalo			35,000	35,000
<u>Radio</u>				
Pittsburgh	10,000			10,000
Youngstown		7,000		7,000
Cleveland			10,000	10,000
Buffalo			10,000	10,000
Direct Mail Advertising		20,000		20,000
Trade Magazines		10,000		10,000
Brochure Production	9,000			9,000
Sportsmens Shows	9,500			9,500
Road Signs	2,000			2,000
Fishing Tournament	5,000			5,000
Subtotal Promotion	\$127,500	\$62,000	\$90,000	\$279,500

Table 29. SUMMARY OF POTENTIAL DEVELOPMENT ACTIONS, ERIE, 1983
(Continued)

<u>Proposed Action</u>	<u>Annual Costs</u>			<u>Total</u>
	<u>High</u>	<u>Priority Level</u>		
		<u>Medium</u>	<u>Low</u>	
<u>Business Development</u>				
Charter Boat	\$ 0			\$ 0
Panfish Charters	0			0
Fishing Guides	0			0
Ice Fishing Safari	3,000			3,000
Boat & Equip. Rental		\$5,000		5,000
Fish Cleaning & Pack.			\$ 5,000	5,000
Subtotal Business	\$ 3,000	\$ 5,000	\$ 5,000	\$ 13,000
<u>Boat Access Development</u>				
<u>Launch Ramps, Upgrading</u>				
Commodore Perry	\$ 1,600			\$ 1,600
Waterworks	1,600			1,600
East Avenue	1,600			1,600
<u>Launch Ramps, New</u>				
Elk Creek	49,000			49,000
Shades Beach		\$49,000		49,000
<u>Marina</u>				
Presque Isle (500 Slips)			\$ 490,000	490,000
Subtotal	\$53,800	\$49,000	\$ 490,000	\$592,800
<u>Shore Access Development</u>				
<u>Piers</u>				
Elk Creek	\$ 2,400			\$ 2,400
Presque Isle Deck 2		\$ 1,600		1,600
Misery Bay		1,600		1,600
Waterworks		1,600		1,600
United Refining			\$ 1,600	1,600
Shades Beach			2,400	2,400
Shoreline at Bayfront		\$ 20,000	106,000	126,000
Subtotal	\$ 2,400	\$130,800	\$ 4,000	\$ 137,200
Grand Total	<u>\$205,700</u>	<u>\$419,800</u>	<u>\$2,472,000</u>	<u>\$3,292,000</u>

Source: Hammer, Siler, George Associates.

Management For Action

While important recommendations have been developed by the consultant team, and important funding and guidance will come from state and federal agencies, the primary responsibility for a successful sports fishing development program in Erie must be assumed by local agencies and individuals. Each recommended action must be assigned to a specific agency or individual who has the experience, the time and the personal commitment to carry out the required work on a continuing basis.

The fish population monitoring, regulation and development responsibilities should, of course, remain in the able hands of the Pennsylvania Fish Commission. This agency has a strong track record in meeting the needs of fishermen across the state. Although they could certainly do more were their funding increased, their efforts will continue to be a strong part of the total fishing development program.

The promotional program is an extremely important responsibility. The state will continue to provide matching funding for locally raised funds for this form of tourism promotion. The day-to-day design and management responsibility for the program should remain with the Chamber of Commerce as a part of its revitalized and invigorated tourism development program. A specific senior member of the Chamber staff should be designated and his full time efforts made available for this important task.

The shore, dock and boat access recommendations should be coordinated by the Erie-Western Pennsylvania Port Authority. This agency has successful experience in marina development and operation and controls a number of waterfront properties with access development

potential. Some of the proposed improvements are the responsibility of the Fish Commission, and the state and county parks departments, respectively, but the coordination of this effort should remain with the Port Authority.

There are important improvements required in the fishing related business services. Charters, guides, equipment and boat rental and others which make up this group which can be provided at a profit by existing and potential future private entrepreneurs.

The overall responsibility for making the fishing development program a success and an important new source of jobs by insuring the successful performance of the various groups identified here is best retained by the Mayor. Erie has a long tradition of strong effective political leadership and this same strong role will be required in this effort. The Mayor has appointed a Bayfront Development Coordinator and this role must be played with continuity and commitment in both public and private efforts if the fishing development program is to be a success.

Section IV. FORECASTS OF FISHING TRIPS AND EXPENDITURES

Section IV. FORECASTS OF FISHING TRIPS AND EXPENDITURES

The programs identified in Section III are designed both to increase Erie's attractiveness for sport fishing trips and to increase the average expenditure per trip. This section examines the extent of impact these programs are likely to have on the total number of fishing trips and expenditures.

A matrix approach has been developed to allow forecasts of fishing trips using various combinations of fishery development actions. The evaluation matrix is based on the relative importance of the key factors affecting fishing trips. Table 30 shows the relative marginal impact which can be generated by each factor.

Table 30. FACTORS FOR WEIGHTING OF IMPROVEMENT PROGRAMS, ERIE, 1983

<u>Factor</u>	<u>Scale of Current Quality</u>	<u>Importance Weight</u>	<u>Marginal Improvement at Each Level of Effort</u>			<u>Total Improvement</u>			
			<u>High</u>	<u>Med</u>	<u>Low</u>	<u>1/</u>	<u>High</u>	<u>Med</u>	<u>Low</u>
Fish Population	7	5	2	1	1	10	15	20	
Promotions	2	2	8	5	3	16	26	32	
Shore Access	4	1	6	3	2	6	9	11	
Boat Access	4	1	6	3	2	6	9	11	
Business Services <u>2/</u>	2	1	8	5	3	<u>8</u>	<u>13</u>	<u>16</u>	
Total						46	72	90	

1/ Refers to high, medium and low priority actions

2/ Includes charter boats and other direct fishing services.

Source: Hammer, Siler, George Associates.

Table 30 provides a scale evaluating the quality of existing Erie fishing factors. Fish populations receives an overall ranking of 7, which reflects the strong natural fish population base in the area and the significant salmonid population available due to stocking. This fish population base has always been the principal reason Erie has attracted a large number of fishermen. Shore and boat access are ranked at four on the quality scale. This reflects the capacity and crowding problems which are experienced at peak periods and the poor facility quality in some places. Promotions and business services have been under-emphasized in the Erie area for a long period of time and are given a low current rating of 2.

The scale of current quality is used as the principal indicator of the marginal importance of improvement in each area. The marginal importance of additional fish in Lake Erie is relatively low, because the existing populations are already meeting most of the needs of the fishermen. However, the marginal importance of promotional activities is high, because too many people in the market area still think of Erie as a "dead lake." Marginal importance declines as additional development actions are added. For example, the initial impact of effective advertising in Pittsburgh will be significant, while advertising beyond this level will be helpful but not as cost effective. Therefore, high priority actions always have a larger marginal improvement than medium or low priority actions.

Table 30 also shows weights used to identify the relative importance of the factors addressed in the development program. Fish populations, with a weight of 5, are considered to be five times as important as shore and boat access or business services. Promotions are

given a weight of 2, suggesting that promotion actions can have twice the impact of improved access in attracting new visitors.

The scale of total improvements generated by different development efforts are computed by multiplying the marginal improvement and the importance weight. For example, the marginal improvement of a high priority fish population development activity is "2". Multiplying this by the importance weight (5) yields the total improvement of 10. When medium priority projects are added, the marginal improvement (1) times the importance (5) gives an extra five points. Since the medium level projects are not done until after the high level projects, the two scores are combined for a total score of 15, when both high priority and medium priority fish population actions are implemented.

The total scores shown suggest that promotion activities will be more important than fish population activities in generating trips. The total scores cannot be used directly to forecast trip increases; they are only useful in indicating which actions are likely to produce the greatest impacts relative to other actions.

Total trip potentials are estimated by examining the increased Erie desirability if all fishing improvements were implemented. If all the development programs were implemented, Erie could expect to increase its penetration rate in the market area substantially. However, the extent of increase is also affected by factors over which Erie has no control, such as travel distance and environmental qualities. Table 31 compares existing penetration rates (baseline) with potential rates.

Table 31. FORECAST PENETRATION RATES, ERIE FISHING MARKET AREAS, 1990

<u>Area</u>	<u>Baseline 1/</u>	<u>Full Development</u>
Pittsburgh	10.3%	19%
I-79 Corridor	7.5%	14%
Other Western PA	2.8%	6%
Inflow Share	(4.5%)	(8%)
Erie	63.2%	78%

1/ Taken from Table 3.

Source: Hammer, Siler George Associates.

Table 31 shows that the share of non-local fishing trips currently captured by Erie ranges from a high of ten percent among Pittsburgh fishermen to a low of 2.8 percent among residents of Western Pennsylvania not in the I-79 corridor. The proposed full development program would generate substantial increases in the market penetration rates achieved in each of these areas. The Pittsburgh metropolitan area penetration rate would be expected to increase to 19 percent of non-local trips, while I-79 corridor penetration would increase to 14 percent and other Western Pennsylvania to six percent.

Increases in penetration rates beyond the levels identified in Table 31 would be extremely difficult, because competitive lakes will continue to offer good fishing alternatives. Many fishing trips to these competitive lakes are made by people who own or rent seasonal housing and would not be expected to shift to Erie regardless of improvements. Other people are primarily interested in having a variety of fishing experiences.

The marginal increases in penetration rates are usually greater in areas with relatively small penetration rates. For example, other Western Pennsylvania's rate more than doubles from 2.8 percent to six percent, while the Pittsburgh rate does not quite double. The percentage increase in the Pittsburgh penetration rate is lower because it started out high relative to other areas. However, the focus of much of the advertising and promotion activities in Pittsburgh helps assure that there still be a substantial penetration rate increase.

Sport Fishing Trip Forecasts

With the projected penetration rate increases possible under the full development program, total fishing trips would be expected to expand substantially. While the tourism penetration rates in surrounding areas come close to doubling, the overall expansion in trips is substantially less. This occurs because local Erie residents are a substantial share of the total fishing trips, and the potential to increase these trips is small because Erie already is capturing the majority of the total market. Table 32 shows the total number of trips which could be expected under baseline and full development alternatives.

Table 32. FISHING TRIP FORECASTS, ERIE, 1983-1990

Area	1983	1990		Percent Change 1983-1990	
		Baseline ^{1/}	Full Development ^{2/}	Baseline	Full Development
		Erie	314,100	348,600	430,200
Pittsburgh Metro	95,400	103,200	190,300	8%	99%
I-79 Corridor	45,800	49,600	92,500	8%	102%
Other Western PA	22,100	23,900	51,200	8%	132%
Subtotal	477,400	525,300	764,200		
Inflow	21,500	23,600	61,100	10%	184%
Total	498,900	548,900	825,300	10%	65%

^{1/} From Table 5.

^{2/} Computed using the penetration rates in Table 31.

Source: Hammer, Siler, George Associates.

Table 32 shows that normal increases in population and the share with fishing licences would be expected to produce a 10-percent increase in Erie fishing trips by 1990 without any new fisheries development programs. Implementation of the full fishery development program would generate a 65-percent increase in the number of fishing trips. The baseline 1990 trip forecast is 548,000, and the full development forecast is 825,3000.

Most of the increase in fishing trips could be generated with less than the full fisheries development program. Implementation of the highest priority portions of the program would result in almost as many trips. Estimates of the effectiveness of the different development actions are made using the weights shown in Table 30. The marginal

improvements and the importance weighting from Table 30 are combined to indicate "improvement scales" shown in Table 33.

Table 33. MARGINAL AND TOTAL IMPROVEMENT SCALES, ERIE FISHERIES DEVELOPMENT ACTIONS, 1983-1990

Factor	Marginal Improvement			Total Improvement		
	High Priority Only	Medium Added	Low Added	High Only	With Medium	With Low
Fish Populations	10	5	5	10	15	20
Promotions	16	10	6	16	26	32
Shore Access	6	3	2	6	9	11
Boat Access	6	3	2	6	9	11
Business Services	8	5	3	8	13	16
Total	46	26	18	46	72	90

Source: Hammer, Siler, George Associates.

Table 33 shows that if all development actions are included, the improvement scale would total 90. If only the high priority actions are included the scale totals 46, or slightly more than half the total improvement. If the high and medium priority actions are both included then the scale totals 72, or 80 percent of the total potential improvement.

The marginal improvement portion of Table 33 is very important because it allows a priority rank of all proposed development actions. High priority promotions has a marginal score of "16" which suggests it should be done first. High priority fish populations and medium priority promotions both have marginal scores of "10," indicating they should be done second and third. High priority business services is "8" and should be done fourth. Low priority promotion ties with high priority shore and boat access at "6." These should be done next.

The actual quality of the fishing and the effectiveness of the promotion of that fishing quality to target fishermen and potential fishermen's market are clearly the most important factors determining sport fishing tourism success. Because fishing quality is already very good in Erie and promotion is not the greatest "leverage" available to increased local effort and expenditures is in the promotion area. As a result, even the less high ranked promotional actions have a greater positive impact than the higher ranked shore and boat access improvements.

Recommended Program. The recommended sport fishing tourism upgrading program, also called the moderate upgrading program, includes all promotional activities in the high-, medium- and low-categories described in the text and summarized in Table 29, except newspaper and radio advertising in Youngstown, Cleveland and Buffalo, plus the high priority actions in the in the other categories of fish improvement, business services, shore access and boat access. The annual cost of the moderate program would be \$235,700, with the major share of this amount in promotion.

Table 34 shows forecasts of trips and expenditures in 1990 under baseline, full- and moderate development programs.

Table 34. EXPECTED FISHING-RELATED EXPENDITURES,
ERIE COUNTY, PENNSYLVANIA, 1990

	<u>Baseline</u>	<u>Full Development</u>	<u>Moderate Recommended Development</u> 1/
<u>Fishing Trips</u>			
Resident With Boat	105,100	129,000	121,500
Resident Without Boat	243,500	301,200	283,400
Subtotal	348,600	430,200	404,900
Non-Resident With Boat	70,900	139,900	121,800
Non-Resident Without Boat	129,400	255,200	212,900
Subtotal	200,300	395,100	334,700
Total Trips	548,900	825,300	739,600
Overnight Stays	32,000	63,200	53,500
<u>Expenditure Per Trip</u>			
Resident With Boat	\$26	\$31	\$30
Resident Without Boat	\$ 3	\$ 4	\$ 4
Non-Resident With Boat	\$28	\$34	\$32
Non-Resident Without Boat	\$11	\$13	\$13
Accommodation Increment	\$25	\$30	\$28
<u>Total Expenditures (000s)</u>			
Resident With Boat	\$2,732.6	\$ 3,990.0	\$ 3,645.0
Resident Without Boat	730.5	1,204.8	1,133.6
Subtotal	3,463.1	5,203.8	4,778.6
Non-Resident With Boat	\$1,985.2	\$ 4,756.6	3,897.6
Non-Resident Without Boat	1,423.4	3,317.6	2,767.7
Subtotal	3,408.6	8,074.2	6,765.3
Overnight Increment	\$ 800.0	\$ 1,896.0	\$ 1,498.0
Total	\$7,671.7	\$15,174.0	\$13,041.9

1/ Sixty-nine percent of the increase generated by the full development program.

Source: Hammer, Siler, George Associates.

Table 34 shows the trip forecasts under the baseline, full- and moderate-development programs. Expenditures per trip are higher under the full- and moderate-development programs in part because the business development actions are expected to increase fishing-oriented expenditure and in part because an increased share of overnight accommodations would be expected. Under the baseline forecasts, \$7.6 million in expenditures are expected. This increases to \$13.0 million with moderate development and \$15.1 million with full development.

Table 35 shows estimated measures of economic benefit for the full- and moderate-development programs.

Table 35. MEASURES OF ECONOMIC BENEFIT, FISHERY DEVELOPMENT PROGRAM, ERIE, 1990

	<u>Full Development</u>	<u>Moderate Development</u>
<u>Benefit Measures</u>		
Direct Expenditures 1/ (000s)	\$ 7,502.3	\$ 5,370.2
With Multiplier 2/ (000s)	\$17,015.1	\$12,110.0
Jobs Supported 3/	340	242
State Tax Increase 4/ (000s)	\$ 836.4	\$ 595.2

- 1/ Increase in Expenditures above the baseline.
- 2/ Multiplier is 2.5 for non-local expenditures and 1.5 local.
- 3/ Assumes \$50,000 in sales supports one job.
- 4/ Based on 6-percent sales tax applicable to half of expenditures with multiplier and average of \$800 annual income tax per job.

Source: Hammer, Siler, George Associates.

The full development scenario would generate additional direct expenditures of \$7.5 million. This would support total economic activity of \$17.0 million, assuming a 2.5 economic base multiplier.

The economic base multiplier is an analytical tool for dealing with the concept that expenditures are re-circulated through the local economy several times. The bigger the local economy is, the more frequently expenditures will be re-circulated before leaving the economy. In Erie, outside dollars are assigned a multiplier of 2.5. Dollars spent by local residents are already within the local economy so the "first dollar" of the multiplier is not included. This leaves local expenditures with a multiplier of 1.5.

Typically, \$50,000 of general expenditures is required to support an average job. A portion of the \$50,000 is direct wages and salary, but most is spent on materials and overhead. Using a \$50,000 job support requirement, the full development program would support 340 additional jobs in Erie County. These would include direct fishing-oriented jobs such as tackle dealers and charter boat captains, but would also include general employment (butcher and baker) supported by the extra multiplier income.

State taxes would be increased by the additional economic activity. A large share of the total expenditures would be covered by the state's six-percent sales tax. In addition, personal income from the new jobs would also be taxed. Total tax revenues would be over \$836,000 for the full-development program and just under \$600,000 for the moderate-program.

The benefits generated by the recommended program of \$600,000 in tax revenues and 250 jobs are substantial. The benefit of making sport fishing more convenient and pleasurable for all Erie residents and visitors has non-economic benefits as well. The size of these benefits is important.

At the same time, our auditors cost/benefit comparison of the \$257,700 annual cost and \$600,000 in annual tax benefits is not appropriate. The annual cost total will be built up over the years as the various improvements and programs are put in place. Likewise, the tax revenue and other economic benefits will gradually build up over time in response to the completed and operational improvements and programs. It would be logical to assume that it would be 1988 or 1990 before the recommended program could be fully in place and have generated full results. Also, the momentum generated for the program will continue to increase benefits after that time.

As local, state, federal and private agencies consider moving ahead with the various components, they will evaluate the total and/or annual cost to them against their own definition of benefits. It is important to establish here that the total mature annual benefits are substantial and have a very positive relationship with costs. The recommended moderate development program which requires these costs and generates these benefits is shown following.

Moderate-Development Program Recap

The recommended moderate-development program includes the following actions:

- o Fish promotion and information staff to coordinate the overall development program and provide fishing information.
- o Information center at the public dock as a focus for activities information and some business services.
- o Newspaper and radio advertising in Pittsburgh.
- o Other promotions and information activities including brochures, sportmen's shows, and road signs.

- o Fishing tournament expansion.
- o Additional steelhead trout stocking.
- o Direct mail and trade magazine advertising.
- o Charter and guide service development.
- o Ice fishing trip services.
- o Panfish charter service.
- o Boat launch upgrading at Commodore Perry, Waterworks and East Avenue.
- o New boat launch ramp at Elk Creek.
- o Shore access development at Elk Creek.

The expected increase in fishing activities generated by these development actions could eventually support many of the other fishery development actions discussed in this report. However, the actions listed above represent the highest priority.

In addition to the proposed new development actions, it is important to assure the continuation of existing fishery efforts. The existing salmon stocking program and the continued monitoring of fish stocks by the fish commission biologists are more important than any new action. The creel census and fisherman survey resulted in a substantial increase in understanding the local fishing industry. Continued efforts along these lines are also very important.

In implementing any fishery development action which affects the biological system, such as spawning area development, it will be important to work closely with the Fish Commission biologists.

Section V. COMMERCIAL FISHING DEVELOPMENT POTENTIALS

Section V. COMMERCIAL FISHING DEVELOPMENT POTENTIALS

The analysis of fishing industry potentials for Erie included an assessment of development potentials for commercial fishing. The requirements of commercial fishing are dramatically different from those of sport fishing because it is an industrial market in contrast to a recreation market.

This section summarizes the analysis of major commercial fishing activity, markets and potential development. First, current fishing activity is examined using licensed captains and total fishermen as key measures. Second, the economic impact of the industry is measured in terms of jobs and sales for fishing and fish processing. Third, a historical perspective is provided, showing the major changes in commercial fishing over time and Pennsylvania's relative position. An assessment of major problems faced by commercial fishing industry is made along with suggested improvement actions.

Recent Commercial Fishing Activity

Commercial fishing activity can be measured in several ways, including number of commercial licenses, number of full-time fishermen and catches. Table 36 summarizes activity for 1982.

Table 36. COMMERCIAL FISHING ACTIVITY, ERIE, PENNSYLVANIA,
1981-1982

	<u>1981</u>	<u>1982</u>
Number of Licensed Gill Net Fishing Boats	23	14
Number of "Full Time" Boats	10	8
Average Crew Size (Including Captain)	5.0	4.5
Total Fishermen	50	36
Share of Year Fishermen are Active <u>1/</u>	40%	40%
Full-Time Equivalent Jobs	25	14

1/ Takes into account poor weather days during fishing season, winter (non-fishing) season and mid-summer inactive periods.

Source: Hammer, Siler, George Associates.

Table 36 shows that the number of full-time commercial fishing boats dropped from 10 to 8 between 1981 and 1982. Average crew size has also dropped, so that the total number of commercial fishermen declined from 50 to about 36.

All fishermen are inactive for substantial portions of the year. No fishing occurs from Thanksgiving to mid-April. Commercial fishing is limited to three days per week until the end of May. Bad weather limits fishing efforts to about five days per week during the primary seasons, although fishermen will work seven days per week if weather allows. Mid-summer catches are often small and will result in fewer fishing days and smaller crews. The annual equivalent employment based on a five-day week dropped from 25 to 14 jobs.

Economic Impact

Fish Caught. The economic impact of fishing activity is suggested both by annual equivalent jobs (described above) and the value of fish

harvested. Table 37 shows pounds and value of fish caught in 1981 and 1982.

Table 37. COMMERCIAL FISH HARVESTS, ERIE, PENNSYLVANIA, 1981-1982

<u>Specie</u>	<u>1981</u>		<u>1982</u>	
	<u>Pounds</u>	<u>Value</u>	<u>Pounds</u>	<u>Value</u>
Yellow Perch	312,018	\$293,700	203,988	\$244,300
Walleye	24,633	22,700	6,338	5,600
All Other	404,010	16,700	370,390	30,400
Total	740,661	\$333,100	580,716	\$280,300

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Yellow perch and walleye have been the "money" fish for commercial fishermen. In 1981 perch accounted for 88 percent of the total catch value, with walleye accounting for another seven percent. Regulations implemented in 1982 to protect the walleye dropped its share of the catch value to two percent. Total value of fish caught commercially dropped from \$333,100 in 1981 to \$280,300 in 1982.

The average value of commercial harvests per active boat was \$33,300 in 1981 and \$35,000 in 1982, which was insufficient growth to keep up with inflation.

Fish Processing. Processing of caught fish in Erie added increased value to the commercial catch. Commercial processing is dominated by Munches and Kearns, the most active processors. Some cleaning and retailing of fishing is also done by Tivis and other retail-oriented operations. The total value added for all processing activities was about \$400,000. Some of Pennsylvania's catch is processed in Conneaut, Ohio, and this is not included in the \$400,000 value added.

Processing operations freeze fish to extend their operating seasons, but employment still fluctuates substantially throughout the year. Peak processing employment hits 25 per day for short periods, combining all processors. Year-round processing employment is limited and the annual full-time equivalent employment is only about eight jobs.

Economic Impact Summary. The direct economic impact of the commercial fishery in 1982 is estimated at 22 full-time equivalent jobs, involving about 60 people on a part-time basis. The total dollar impact of value caught and value added during processing was about \$680,000 in 1982. This is an average of \$85,000 per active fishing boat.

Historic Trends

Major shifts in the fish populations of Lake Erie have resulted in a substantial decline of Erie's commercial fishing industry during this century. Table 38 shows commercial fish production by decade for Lake Erie as a whole.

Table 38. COMMERCIAL FISH PRODUCTION BY SPECIES,
LAKE ERIE, 1910-1980

<u>Specie</u>	<u>1910s</u>	<u>1920s</u>	<u>1930s</u>	<u>1940s</u>	<u>1950s</u>	<u>1960s</u>	<u>1970s</u>
Lake Herring	26,800	12,000	900	3,200	200	(2)	0
Whitefish	2,800	1,700	2,700	4,100	1,200	(7)	(2)
Blue Pike	8,500	12,300	15,500	13,800	10,300	0	0
Walleye	1,600	1,700	3,000	5,000	8,400	1,000	300
Yellow Perch	2,900	5,900	9,100	4,000	14,500	24,000	13,800
Smelt	0	0	0	0	4,000	13,300	16,200
All Other	<u>19,100</u>	<u>11,500</u>	<u>11,500</u>	<u>11,300</u>	<u>15,600</u>	<u>13,200</u>	<u>11,400</u>
Total	61,700	45,100	42,700	41,400	54,200	51,500	41,700

Note: Data in thousands of pounds.

Source: Great Lakes Fishery Commission and Hammer, Siler, George Associates.

Table 37 shows that there has been a dramatic shift from catches of lake herring, whitefish and blue pike early in the 1900s to yellow perch and smelt in the most recent years. Biological factors were the principal causes of the dramatic declines in lake herring, whitefish and blue pike, although extensive fishing pressure helped accelerate the decline. The presence of a substantial fixed investment in the fishing fleet led to a shift of target and pressure as fish supplies changed.

The size of the fishing fleets of the various jurisdictions around Lake Erie has contributed to shifts in the catch by these areas. Table 38 shows Pennsylvania's share of total lake harvests.

Table 39. FISH HARVESTS, LAKE ERIE AND PENNSYLVANIA SHARE
(in thousands of pounds)

<u>Time Period</u>	<u>Lake Erie Total</u>	<u>Pennsylvania</u>	<u>Pennsylvania Share</u>
1910	61,700	N/A	N/A
1920	45,100	N/A	N/A
1930	42,700	2,580	6%
1940s	41,400	2,720	7%
1950s	54,200	1,830	3%
1960s	51,500	920	2%
1970s <u>1/</u>	41,700	370	1%

1/ Based on data through 1977.

Source: Great Lakes Fishery Commission and Hammer, Siler, George Associates.

Pennsylvania's share of total Lake Erie fish harvests is only one percent for all species during the 1970s, due to its declining fleet size. Canadian harvests have increased dramatically and now account for well over 80 percent of the lake harvest. The impact of the Pennsylvania commercial fishing fleet on fish populations in the lake as a whole is minor compared with the impact of other jurisdictions.

Trend Summary. Several key generalizations can be made about the trend data and Pennsylvania shares. The commercial fishing industry is driven primarily by the availability of desirable fish. However, the infrastructure represented by the fishing fleet and processing facilities is an important secondary factor. The U.S. fleet and processing capabilities have declined as the more desirable fish are no longer available. The Canadian fleet and processing capabilities have continued to expand through the use of substantial government supports. They have continued to focus their efforts on available species and have added substantial smelt processing. Erie's current position with minimal fleet and processing capabilities is not readily suited to major commercial fishing development.

Proposed Commercial Fishing Development Actions

Revised Yellow Perch Regulations. The yellow perch is currently the most important commercial species. Recent regulations designed to protect the yellow perch have created substantial hardships for the commercial fishermen. These regulations are necessary for the protection of the perch given its current depressed population. However, perch are an especially prolific species and a population rebound can be expected if all jurisdictions adequately regulate the harvest. Since Canadian harvests account for the bulk of the perch taken, it is important for the U.S. to work with the Canadians in limiting their harvest. The Great Lakes Fishery Commission is the appropriate body to negotiate harvest agreements. The City of Erie should officially request the Commission to pursue stronger Canadian perch harvest limits.

Improved perch populations can be generated through natural reproduction assuming appropriate harvest limits are established. Once

this occurs, the Pennsylvania Fish Commission will be able to relax some of their most critical perch regulations. This will help substantially in supporting Erie's existing commercial fishermen.

Exploration of Alternative Species. Dependence on yellow perch has left Erie's commercial fishing industry especially vulnerable to its decrease. Options need to be explored for alternate species use. The only species with sufficient abundance to justify further considerations are the coarse fish: smelt, gizzard shad, red horse and others. These fish are not commercially desirable as table fish, but can be used in producing fish sticks, cat food, or a protein meal.

Prototype coarse fish processing facilities typically require a minimum of 13 short tons of raw fish input per day, and large plants handle 300 tons per day. These sizes are typically required to generate the economies needed for profitable coarse fish production. Most facilities of this type are accessible to bodies of water which support year-round fishing. In 1982, the Erie fishing fleet harvested 290 tons of total fish. This is an average of just over one ton per day, using a seven-day per week effort over a mid-April to late-November season. A substantial increase in fishing capacity would be required to reach a minimum economical size for a coarse fish processing facility supported solely by Pennsylvania fishermen.

The coarse fish have not been previously targeted because they are small and their filets are relatively undesirable in the marketplace. With the small average size of many of the coarse fish, traditional fileting produces too small a yield relative to the high labor costs. This is especially true because the retail market value per pound is very low for filets of coarse fish.

The primary use of the coarse fish is to separate the flesh from other parts of the fish as minced fish. This would then be used in making patties or sticks. The scrap and unusable portions of the fish would be converted into fish meal for sale to animal feed preparers.

The first step required in the process is the fish are scaled, deheaded and eviscerated. After cleaning, the fish are put through a machine which separates the bone and flesh by pressing the flesh through small holes in a metal drum. The resulting minced fish could either be frozen and sold or processed further into fish sticks and patties.

Several major pieces of equipment are required for the process to run efficiently. Table 40 shows expected equipment costs for a facility which would process 13 tons per day.

Table 40. COARSE FISH PROCESSING EQUIPMENT COSTS, ERIE, 1983

<u>Equipment Description</u>	<u>Cost</u>
Unloading Station	\$193,000
Sorting Station	34,000
Scaling Machinery	26,000
Large Fish Deheading Machinery	24,000
Large Fish Eviscerating Machinery	24,000
Small Fish Deheading/Eviscerating Machinery	107,000
Meat/Bone Separation Machinery	80,000
Box Filling Machinery	25,000
Freezing Machinery	111,000
Cold Storage and Refrigeration	<u>33,000</u>
Total	\$657,000

Source: Louisiana State University Department of Agribusiness and Hammer, Siler, George Associates.

To the expected equipment costs of over \$650,000 should be added land and building costs which would bring the total initial capital costs to over \$1.0 million.

The existing capacity of the commercial fleet is insufficient to meet the required fish inputs of a plant of this size. However, a major plant is required to gain efficiencies of scale and create a reliable source of supply for potential consumers. The economics of using coarse fish is based on extremely low costs per ton of fish. These costs have only become reasonable in areas with substantially underutilized fishing fleets. Operators of fishing boats will not shift to coarse fish unless they have no other more profitable fish population available. In light of this, it is unreasonable to expect to bring additional commercial fishermen into Erie specifically to target coarse fish, which would be needed to attain normal plant capacities. Therefore, we feel that a coarse fish production facility based solely on the Pennsylvania commercial fleet is not economically feasible.

There is a need to consider the possibility of a coarse fish processing facility to use the combined resources of New York, Pennsylvania and Ohio commercial fishermen. The western basin areas have a much larger coarse fish population than Erie and are a more logical location for a common facility. The central basin area is also a strong possibility because transportation costs can be minimized. The common processing facility would be extremely beneficial to Erie fishermen, because it would generate a new market. There is a no special reason for the facility to be located only in Erie to produce these benefits, and there are significant economic arguments against an Erie location. The possibility of a processing facility in the central basin

to serve all the U.S. waters should be explored further through the Great Lakes Development Association.

Dock Space Provisions. An immediate problem of the remaining commercial fishermen is the availability of dock space at reasonable prices. The large fishing boats are not readily suited to existing dock space near the public dock because of potential damage to the fragile fiberglass pleasure boats nearby. Dock space costs have accelerated substantially in recent years, placing new economic pressures on the commercial fleet.

The city should work with commercial fishermen in arranging sufficient dock space at reasonable prices. This is particularly needed in the next few years since declining perch harvests are threatening the existence of the industry. Potential dock space can be provided at the grain elevator site. If this space is required for winter storage by Perry Shipbuilding for major ship repairs, then a cooperative agreement providing dock space at Cascade Docks should be considered.

Conclusion

Many recommendations have been made throughout this report. They are summarized below. Page numbers at which each recommendation is discussed in detail are provided. Responsibilities for managing implementation of recommendations are assigned to agencies and individuals.

- o The \$52 cost per harvested yellow perch is too great to recommend such a program, p. 42.

- o Because the difficulties experienced in stocking walleye in other areas, walleye stocking is recommended as a low priority, p. 43.
- o Developing gravel bottoms between the base of the peninsula and the Erie Yacht Club for smallmouth bass is a low priority because they are reproducing, p. 47.
- o The value of an artificial reef in Erie would be minimal because it would not significantly improve yellow perch and walleye fishing, p. 48.
- o A special effort should be launched to attract the National Outdoor Writers Association convention to Erie, p. 54.
- o Erie's fishing promotion program should be located on or near the Public Dock. Staffing costs for a promotion coordinator and an assistant would be about \$45,000 annually. Information center space and operating costs are estimated at \$12,000 annually, p. 55.
- o An advertising outreach program is recommended to increase Erie's name recognition as a fishing destination. Weekly newspaper ads during the fishing season would cost about \$35,000 annually. Radio advertisements during the same periods would cost from \$8,000 to \$10,000 depending on their length. These advertising campaigns should be conducted in Pittsburgh and Youngstown at a total estimated cost of \$177,000. Lower priority is recommended for advertising campaigns in Buffalo and Cleveland, pp. 56-58.
- o The promotion program should also include direct mail, trade magazine, brochure distribution, and trade show participation. Direct mail to 50,000 households would cost about \$20,000. A budget of \$10,000 is recommended for trade magazines. A high priority is for the fisheries development office to initiate brochure production at an annual cost of \$9,000. The annual cost of printing a brochure is \$4,500. The Pittsburgh, Youngstown, Cleveland, Buffalo, and Harrisburgh trade shows should be covered each year at an estimated cost of \$9,500, pp. 60-61.
- o To aid visitors in finding their way to Erie, directional signs should be provided. The fisheries development office should place about 20 signs costing a total of about \$2,000, p. 61.

- o The Fishing Information Center should coordinate sponsorship of an annual fishing tournament. The tournament should concentrate on principal native species such as perch or walleye, pp. 61-62.
- o Existing boat ramps should be upgraded where needed to insure their safe use. Access to those ramps along existing streets should be improved and signed. A gabion breakwater should be constructed to aid navigation on windy days. These improvements are estimated to cost \$662,000, p. 76.
- o Marina facilities have been programmed over the past five years but remain unbuilt. It is recommended that a 500-slip marina, launch ramps, washhouses, road access, parking, and a travel unit be constructed. Their cost is estimated at \$3.5 million, p. 81.
- o Additional fishing piers are suggested at the State Park and Misery Bay. Development of additional piers is given medium priority because existing shore access is only occasionally crowded, p. 89.
- o A breakwater or retaining wall between Cascade Docks and the Chestnut Street pool is recommended. It would cost \$900,000, p. 90.
- o Initiation of part boat services should be pursued. Panfishing charter services should be initiated by the fishery development coordinator, p. 93.
- o The Fishing Information Center should serve as the referral center for fishing guides. These guides would provide on-shore assistance to fishermen unfamiliar with fishing or with Erie, p. 93.
- o The city and Fishing Information Center should promote provision of additional boat and equipment rentals. Fish cleaning, smoking, fileting, and packing services should be encouraged among retail fish outlets, p. 95.
- o The City of Erie should officially request the Great Lakes Fishery Commission to negotiate harvest agreements with Canada, p. 123.

- o After the yellow perch population has increased, the Pennsylvania Fish Commission should relax some of its perch regulations to benefit commercial fishermen, p. 123.
- o Coarse fish processing equipment costs to process 13 tons per day are over \$650,000. Land and building costs add more than another \$350,000 for a total capital investment of over \$1 million. A coarse fish production facility based solely on the Pennsylvania commercial fleet is not economically feasible, pp. 125-126.
- o The possibility of a coarse fish processing facility in the central basin to serve all U.S. waters should be explored further through the Great Lakes Development Association, p. 126.
- o The City of Erie should work with commercial fishermen in arranging sufficient dock space at reasonable prices. Dock space is available at the grain elevator or at Cascade Docks, p. 127.

Primary responsibility for a successful sports fishing development program in Erie must be assumed by local agencies and individuals. Each recommended action must be assigned to a specific agency or individual who has the experience, the time and the personal commitment to carry out the required work on a continuing basis.

The fish population monitoring, regulation and development responsibilities should, of course, remain in the able hands of the Pennsylvania Fish Commission. This agency has a strong track record in meeting the needs of fishermen across the state. Although they could certainly do more were their funding increased, their efforts will continue to be an important part of the total fishing development program.

The promotional program is an extremely important responsibility. The state will continue to provide matching funding for locally raised funds for this form of tourism promotion. The day-to-day design and

management responsibility for the program should remain with the Chamber of Commerce as a part of its revitalized and invigorated tourism development program. A senior member of the Chamber staff should be designated and his or her full time efforts made available for this important task.

The shore, dock and boat access recommendations should be coordinated by the Erie-Western Pennsylvania Port Authority. This agency has successful experience in marina development and operation and controls a number of waterfront properties with access development potential. Some of the proposed improvements are the responsibility of the Fish Commission, and the state and county parks departments, respectively, but the coordination of this effort should remain with the Port Authority.

There are important improvements required in the fishing related business services. Charters, guides, equipment and boat rental and others which make up this group which can be provided at a profit by existing and potential future private entrepreneurs.

The overall responsibility for making the fishing development program a success and an important new source of jobs by insuring the successful performance of the various groups identified here is best retained by the Mayor. Erie has a long tradition of strong effective political leadership and this same strong role will be required in this effort. The Mayor has appointed a Bayfront Development Coordinator and this role must be played with continuity and commitment in both public and private efforts if the fishing development program is to be a success.

Appendix A. EVALUATION OF FISH STOCKING POTENTIALS AND COSTS



ENVIRONMENTAL RESOURCE ASSOCIATES, INC.

Bohannon Science Center • 20700 North Park Blvd. • University Heights, Ohio 44118 • (216) 321-0933

28 Feb. 1983

Mr. Tom Witt
Hammer, Siler, George and Associates
1111 Bonifant Street
Silver Spring, Md.
20910

Mr. Witt,

Attached is a draft of our final evaluation of the potential success and costs associated with stocking programs in the Erie, Pennsylvania area. Please note that as a result of the meeting held in Erie I have revised the walleye estimates to reflect the 14% mortality agreed upon by sportsmen and the Pa. Fish Commission. I have also included a cost per caught fish based upon an annual stocking over the life of the fish, which means that the cost is less if the species is stocked over an extended period of years. I hope that these "best guess estimates" will serve your purposes.

Sincerely,

Andrew M. White, PhD
President

between the Pennsylvania and Ohio catch rates leads one to the only possible conclusion, more fish are caught per hour and fish are generally larger in the Erie area.

The stocking of smallmouth bass into areas where populations are already successful yields little in the way of returns. In studies conducted by Funk and Fleener (1974) fingerlings were stocked into an already populated area at a rate of 80 fish per acre. Over the next five full years, the total yield to the angler was 2.2% of the stocking. Quite simplistically, in order to increase the smallmouth population by a factor of 2, we would have to stock an estimated 15,800 fingerlings times 45.5 (the 2.2% return). This would have to be done for five consecutive years in order to insure the average return of 15,800 fish per year. This program would require at least 719,000 fingerlings per year.

Even with this type of stocking program, we suspect that the increased population would actually result in emmigration of individuals at a rate greater than presently is occurring, or that the lack of forage and/or habitat would result in smaller average fish at each year of age. In either case, it would appear that the return would not be as high as the 2.2% indicated.

Such a stocking program, even if successful, would be excessive in cost per fish returned to the angler. The 719,000 fingerlings per year would return 15,800 legal fish harvested only after an investment of 3 - 5 years. If we assume no initial costs associated with the funding of the first few years of stocking with no return (such returns would occur after stocking was discontinued), then the following costs can be calculated.

719,000 fingerlings @ \$ 0.85 ea = \$ 611,065.00

\$ 611,065.00 = \$ 38.68 per caught fish
15,800

s Erie. It is probable that the Erie area yellow perch are equally as mobile and that they periodically move into the waters of Ohio, New York and Canada where they become vulnerable to both the sport and commercial fishery.

Information derived by the yellow perch task group (1981) for the central basin of Lake Erie, including Pennsylvania waters, provides a guide for the calculation of perch survival under current sport and commercial pressure. In this study, approximately 50,000,000 age I perch were estimated to be present in the central basin during 1976. The angler harvest in Ohio waters of the central basin during 1977 was approximately 292,431 age II yellow perch. This means that with all mortalities included, natural, sport and all commercial, and with angler success already part of the figures, the return from yearlings was .58%. As many authors have reported, the first summer mortality would be about 12% and the first winter mortality is about 50% of the fingerlings. These age II fish then would have represented a fall fingerling population of about 112,000,000 fish, a return of .26% to the angler.

$$50,000,000 \times 1.12 \times 2 = 112,000,000 \text{ fall fingerlings}$$

Yellow perch harvests in the Erie area in 1980-81 were estimated to be 426,000 fish. Average size was slightly larger than the central basin Ohio fish but it is probable that the age II class contributed at least 40% to the harvest. This would mean that the number of age II fish harvested was 170,640. An application of the central basin figures would dictate that a yearling population of 29,420,689 was present the previous year and that the fall fingerling population would have been in excess of 65,902,300 fish.

$$29,420,689 \times 1.12 \times 2 = 65,902,344 \text{ fall fingerlings}$$

EVALUATION OF A WALLEYE STOCKING PROGRAM

Erie, Pennsylvania

Maximum results of walleye stocking programs have consistently been associated with introductions into enclosed areas, such as reservoirs, where fish (walleye) are not present and/or reproductive. In such situations the fish have no opportunity to emigrate and are not in competition with native fry or fingerlings. Further, such areas are normally free of large numbers of other competitive forces such as other predators, other species competing for forage etc. Even in these situations the general return to the angler over several years is about 2% of the number of stocked fry.

Studies of angler harvest in such reservoirs indicate that success rates generally are about 20 - 25% per year on a year class, (Mraz, 1968; Olsen, 1958). Also, the catch is generally composed of about 50% age II individuals. This means that if 10,000 fry are stocked, only 200 fish will be caught, and that about 100 of these will be taken in their second year. To provide an annual harvest of 200 fish, the 10,000 fry would have to be stocked each year.

This, of course, represents the ideal situation, with no walleye/walleye interactions, no interspecific competition of significance and an abundance of forage during the period of life of the fish. It also assumes no additional mortality due to a commercial fishery and no emigration.

Realistically, Lake Erie cannot be considered comparable in any way to the above situation. Walleye are present in the Erie area at what appears to be a stable, reproductive population. Many predators of the walleye are present including the yellow

Utilizing the 1980-81 angler survey data, we find that Pennsylvania anglers harvested 37,200 walleye. As with most walleye harvests, most of these fish were of the age II and III classes. The Ohio walleye fishery consistently harvests about 75% age II and III fish as do reservoirs which have been investigated. Larger fish, age IV - XII normally contribute a total of about 25% to the harvest. We may safely assume, therefore, that 27,900 fish of age II and III were caught. If these represent the .26% return previously discussed, we can then back-calculate the number of fry necessary for this harvest under "best case" production in Lake Erie. The result of this calculation is 10,730,769 fry.

$$\frac{27,900}{.0026} = 10,730,769$$

At this point, other considerations must also come into the calculations. The above figures represent assumed "best case" survivals and do not include commercial harvest, losses due to emmigration etc. At this point, however, we shall hold these figures for future modification, especially in light of studies by Hile (1936) who stocked 15,000,000 fry into Saginaw Bay and noted no discernable increase in either sport or commercial harvest.

The stocking of fingerlings into areas where walleye are already productive (as in Erie) has been investigated. Studies by Mraz (1968) were accomplished in a reservoir. In this case, walleye fingerlings were added at rates of two to five times the native population depending on the year of study. He reported that the results were far poorer than expected. The survival to age I was less than 2% of the survival of native fish and in some years the survival was nearly zero. An average of 2% was calculated only because one year had high survival

studied a moderate population level of walleye in the western basin of Lake Erie. Emigration was probably at a rather low level due to the lack of pressures to emigrate due to overpopulation. Even so, 32% of the tag recaptures were taken more than 30 miles from the site of tagging. More than half of these were from recapture sites over 50 miles away and some were from areas more than 100 miles distant. With this in mind, we can assume that about 30%, at best, will leave the Erie area. These will be lost to the harvest, thus must be provided for in the original stocking estimates. One might argue that immigration is also occurring, but this is already happening, and unless another area begins massive stocking programs to provide additional immigrants, we do not see this contributing to the harvest. Further, we would foresee that as more walleye were added to the Erie population, pressures to emigrate would increase and more than 30% would be lost. We feel that at least an additional 30% would have to be stocked:

$$10,730,769 \times 1.30 = 13,949,999 \text{ fry}$$

$$12,749,184 \times 1.30 = 16,573,939 \text{ fingerlings}$$

At this point we should return to the fry estimates which were, as will be recalled, based on native successes. Olsen and Wesloh (1962) report that increases in walleye populations where walleye were productive was accomplished only at very high numbers of stocked fry, 5000 - 10000 per acre. At these rates, the number to be stocked in Presque Isle bay would be a minimum of 16,500,000 and a maximum of 33,000,000. This would only be a portion of the stocking, since the acreage of at least a portion of the lake must also be considered. If three times the maximum were used as a figure the stocking would be in the neighborhood of 100,000,000, which we feel is a reasonable

In the above estimates for a walleye stocking program there are other problems which have not been considered. In Forney's (1974) publication for example, there is considerable evidence that walleye populations under a lack of forage will cannibalize heavily. Also, as populations increase the rate of perch predation by walleye increases. Thus cannibalism would reduce the estimated returns from the stocking and increased walleye populations could lead to a further reduction in yellow perch populations.

It is also necessary to consider where the stocked fry and/or fingerlings are to be obtained. The 115 million fry which we have estimated would require an incredible number of adults to supply the eggs to the hatchery. Even half that number of fry would require more than 16,000 female walleye for egg stripping. This is nearly equal to the number of walleye caught by anglers in 1980-81.

We would conclude that a walleye stocking program would not increase the local population to any measureable degree unless stocked in very large numbers, thus the possibility seems both infeasible as to availability of stock and not economical or cost effective.

stockings but approximately 50% of the Ohio caught fish were from Pennsylvania introductions. The cost of coho fingerlings (5-6 inch) is approximately \$.20, thus the return to the Pennsylvania angler at a catch rate of 10% would be at a cost of \$ 2.00 per fish.

CHINOOK

Stockings of chinook salmon do not yield the returns that are realized with the coho. Pennsylvania caught fish seem to return to the angler at a rate of about 1% over three years. However, the fish are considerably larger than coho, and would seem to be more of an attraction to non-local fishermen. Also, the offshore fishery for chinook would result in a larger charter trade. The chinook does not seem to be a prime species for local fishermen but rather would be a "Trophy" class fish for the serious non-local fisherman. The cost per fish caught is also higher than coho, since the \$.10 per fingerling only returns at the 1% rate. Cost per caught fish is \$ 10.00 each.

STEELHEAD

By far, the steelhead is the salmonid with the most appeal from the cost and catch rate of all salmonids. The species seems to be far more of a "resident", not straying to Ohio waters or to the offshore areas as do the coho and chinook. Steelhead are available for boaters, shore fishermen and ice fishermen during an extended time of the year. Thus they provide an extended season, unlike the principal fall fishery for coho or the offshore fishery for chinook. The return to the angler is in excess of 20% over the normal three year period, and at a cost of \$.25 each for fingerlings the species returns at a cost per fish of only \$ 1.25. If only one species were to be stocked in the Erie area, we would recommend the steelhead.

**COST PER CAUGHT FISH
UNDER CONTINUOUS STOCKING FOR
THE LIFE OF THE FISH**

Coho Salmon	\$ 2.00 per fish
Chinook Salmon	\$ 10.00 per fish
Steelhead Trout	\$ 1.25 per fish
Walleye (fry)	\$ 30.91 per fish
Walleye (fingerlings)	\$ 267.32 per fish
Perch (fingerlings)	\$ 33.75 per fish
Smallmouth (fingerlings)	\$ 38.68 per fish
Lake Trout	Unknown
Brown Trout	Unknown but probably similar to Steelhead calculations.

Appendix B. EVALUATION OF KEY FISH SPECIES BY
FISHING MODE AND LOCATION

Appendix B. EVALUATION OF KEY FISH SPECIES BY
FISHING MODE AND LOCATION

A detail evaluation of harvests for key species was made as input to the economic evaluation for each of the key species. This evaluation was based on data obtained in the 1981-1982 Lake Erie Angler and Boater Use and Angler Harvest Survey Census is summarized below.

Smallmouth Bass

Smallmouth harvest in all Lake Erie waters, including the bay was 33,100, based on a total catch of 90,600. Many of the 57,500 smallmouth caught but not kept would have been less than the legal size of 12 inches. However, it is likely that there were also a significant number of legal fish caught but released. Bass fishermen are known for their propensity to keep relatively few fish as a means of insuring continued good fishing. Table B-1 shows the distribution of smallmouth bass harvests by fishing mode and area.

Table B-1. SMALLMOUTH BASS HARVEST, LAKE ERIE
PENNSYLVANIA, JUNE 1981-MAY 1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	1,700	3,300	600	5,600	17%
Boat	4,100	12,300	11,000	27,400	83
Ice	<u>0</u>	<u>100</u>	<u>0</u>	<u>100</u>	<u>0</u>
Total	5,800	15,700	11,600	33,100	100%
Share	18%	47%	35%	100%	

Sources: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Table B-1 shows that the smallmouth is principally a boat fishery, with only 17 percent of the total harvest taken from shore. The Presque Isle Bay is clearly the most productive of the fishing waters, capturing 47 percent of the total harvest. However, both the east and west lake areas produce reasonably large smallmouth fish harvests.

Yellow Perch

The yellow perch harvest during the June 1981-May 1982 period was 498,100. The total catch was almost 40 percent higher at 681,200. There is no legal minimum size for the yellow perch, but most of less than six inches would normally be returned. Table B-2 shows the distribution of yellow perch harvest by fishing mode and area.

Table B-2. YELLOW PERCH HARVEST, LAKE ERIE PENNSYLVANIA,
JUNE 1981-MAY 1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	400	88,900	2,200	91,400	18%
Boat	35,500	138,200	33,500	207,200	42
Ice	<u>0</u>	<u>199,400</u>	<u>0</u>	<u>199,500</u>	<u>4</u>
Total	35,900	426,500	35,700	498,100	100%
Share	7%	86%	7%	100%	

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

The yellow perch fishery is strongly oriented to Presque Isle Bay, rather than the open lake, with 86 percent of the harvest taken from the bay. Yellow perch is unique among the principal target species in Erie in that it provides support for all three fishing modes: boat, shore and ice. The single largest segment of perch harvest was ice fishing in the bay, which accounted for close to 200,000 fish in the winters of 1981/1982. Ice fishing harvests are extremely variable based on the number of days of "good ice." The most recent ice fishing season was unusually poor because of warm weather. Perch seem to be extremely vulnerable to ice fishing.

Boat fishing for perch is another substantial portion of the harvest. The bay provides the largest perch boat fishery, but both the east and west lake areas also have significant fisheries. The open lake areas produce substantially larger fish than the bay, suggesting the populations are distinct. While larger perch are available outside the bay, the bay continues to be the principal boat fishing location because it is a better water body for the small perch fishing boats.

Shore fishing for perch produces less than half the harvest of either boat or ice fishing. Nevertheless, there were 91,400 perch harvested from the shore which represents a good fishery.

Walleye

The total walleye harvest of 37,200 fish during the June 1981-May 1982 period demonstrates a substantial fishery. A distribution of the harvest by mode and location is shown in Table B-3.

Table B-3. WALLEYE HARVEST, LAKE ERIE PENNSYLVANIA, JUNE 1981-MAY 1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	100	100	0	200	1%
Boat	26,800	1,500 ^{1/}	8,700	37,000	99
Ice	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	26,900	1,600	8,700	37,200	100%
Share	73%	4%	23%	100%	

^{1/} A substantial share of this segment is assumed to have been caught in the lake by boats returning to the bay.

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

The walleye fishery is almost totally a boat-oriented fishery, accounting for 99 percent of the total harvest. Shore fishermen on the west lake area occasionally catch walleye, usually when fishing for salmon or trout. The fishery is also totally dominated by a lake orientation rather than harvests in the bay. The Fish Commission data show only four percent of total harvest attributed to the bay, and most of this is actually lake harvests in boats which returned to the bay.

The lack of walleye availability in the bay has resulted in a decision to try an experimental stocking effort both by the Pennsylvania Fish Commission and through a co-operative effort of local sportsmen at Chestnut Street.

Salmon

Two principal types of Salmon are stocked: coho and chinook. Chinook, a king salmon, have longer life spans and reach a larger size than the Coho. However the survival rate of the Chinook is substantially less than the Coho at Erie. Table B-4 shows the amount located and fishing made for the Coho harvest.

Table B-4. COHO SALMON HARVEST, LAKE ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	18,000	16,000	31,000	22,700	53%
Boat	9,200	81,000 ^{1/}	2,700	20,000	46
Ice	100	400	0	500	1
Total	<u>27,300</u>	<u>10,100</u>	<u>5,800</u>	<u>43,200</u>	<u>100%</u>
Share	64%	23%	13%	100%	

^{1/} A substantial share of this harvest is from the lake and made by charter boats and private docked at the bay.

Source: Pennsylvania First Commission and Hammer, Siler, George, Associates.

A total of 43,200 coho salmon were harvested during the June 1981-May 1982 period. The west lake area is the primary focus of harvest, accounting for 64 percent of the total. Fish commission figures show a 23-percent share of coho attributed to the bay, but a substantial share of these are the downrigger boat returned to marinas in the bay.

The coho fishery is evenly mixed between shore fishing, with 53 percent of the harvest and boat fishing with 46 percent. Most fishing occurs at the mouths of streams during the fall spawning runs. This includes such fishing near the mouth, fishing from piers (particularly at Walnut Creek). and in boats anchored near shore. There is also a relatively small, but growing, downrigger fishery for salmon in deep water during spring and summer months.

The Chinook Fishery produced a much smaller harvest of 7,900 fish during the survey period. Table B-5 shows the distribution of the Chinook harvest.

Table B-5. CHINOOK SALMON HARVEST, LAKE ERIE, PENNSYLVANIA,
JUNE 1982-MAY 1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	3,200	00	500	3,700	47%
Boat	3,200	400	600	4,200	53%
Ice	00	00	00	00	0
Total	<u>64,000</u>	<u>400</u>	<u>1,100</u>	<u>7,900</u>	<u>100%</u>
Share	81%	5%	14%	100%	

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

The chinook harvest closely follows the same pattern as the coho. The harvest is strongly concentrated in the west lake areas, with a close mix between shore and boat catch. Chinook are even less frequently harvested from the bay than are coho.

Steelhead Trout

Steelhead make spring and fall spawning runs and are most susceptible to catch at that time. Distribution of Steelhead harvest is shown in Table B-6.

Table B-6. STEELHEAD TROUT HARVEST, LAKE ERIE, PENNSYLVANIA,
JUNE 1981-MAY1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	9,900	200	1,100	11,200	76%
Boat	1,700	700	00	2,400	16
Ice	<u>1,100</u>	<u>1,000</u>	<u>00</u>	<u>1,200</u>	<u>8</u>
Total	12,700	1,000	1,100	14,800	100%
Share	86%	7%	7%	100%	

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Most steelhead are harvested from shore in the west lake area. Typically these catches are made during the fall spawning runs which correspond to the salmon runs. Shore fishing effort at the time is very high which contributes to the high share of total harvest. Currently, many steelhead are caught incidently by salmon fishermen. However, steelhead are desirable fish and are often viewed as a good substitute for the salmon.

Other Species

There are a number of other popular game fish as well as panfish available in the bay and lake. Game fish include muskellunge, northern pike, brown trout, lake trout and palomino trout. These species are

stocked but may also experience some natural reproduction. Table B-7 shows the total harvests and principal mode and locations.

Table B-7. SELECTED GAME FISH HARVESTS, ERIE, PENNSYLVANIA, JUNE 1981-MAY 1982

<u>Specie</u>	<u>Total Harvest</u>	<u>Principal Location(s)</u>	<u>Principal Modes(s)</u>
Palomino Trout	600	West	Shore
Brown Trout	900	West	Shore
Lake Trout	1,200	Bay	Boat/Shore
Muskellunge	100	Bay	Boat
Northern Pike	200	Bay	Boat/Shore

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Muskellunge and northern pike were harvested exclusively in the bay. Palomino trout was harvested only in the west lake area while brown and lake trout were harvested in all three major subareas.

Panfish are a much more important addition to the total fishery than the supplemental game fish listed in Table B-7. While perch is typically the target fish, these are several other species which comprise a general panfish fishery. These include: crappie, pumpkinseed, bluegill, rock bass, channel catfish and bullhead. Table B-8 shows combined harvest data for these species.

Table B-8. PANFISH^{1/} HARVEST, LAKE ERIE, PENNSYLVANIA,
JUNE 1981-MAY 1982

	<u>West</u>	<u>Bay</u>	<u>East</u>	<u>Total</u>	<u>Share</u>
Shore	1,000	63,000	1,200	65,400	50%
Boat	1,600	32,000	7,800	41,400	32
Ice	0	24,000	0	24,100	18
Total	<u>2,600</u>	<u>119,300</u>	<u>9,000</u>	<u>130,900</u>	<u>100%</u>
Share	2%	91%	7%	100%	

1/ Includes: Channel catfish, black and white crappie, pumpkinseed, bluegill, rock bass, and bullhead.

Source: Pennsylvania Fish Commission and Hammer, Siler, George Associates.

Total harvest of over 130,000 fish is a substantial part of the fishery. The bulk of the harvest, 91 percent, is taken from the bay. The largest segment of the non-perch panfish harvest is taken by shore fishermen, but boat and ice fishermen also realize substantial harvests.

Appendix C. SELECTED FISHING-ORIENTED BUSINESSES CONTACTED

Appendix C. SELECTED FISHING-ORIENTED BUSINESSES CONTACTED

Bait/Tackle

B.A.C. (Elk Creek)
Poor Richards
Angler
Elk Creek Sports Store Inc.

Boat Sales And Services
And Marinas

Bayshore Marine
McAllister
Brockway
Chet Alex
Cherry Street Marina

Motels

Airport Motel
Nubers Motel
Maple Motel
Verndale Motel
Durtwood Motel
Springfield Inn
(Numeres other motels were
contacted during the earlier
Bayfront study)

Charter Boats

Bayshore Marine
Charter Boat Captins Association
Chet Alex
Rugares Sport Fishing

Commercial Fisherman

Munche's Fisheries
Kearns Fisheries
Tivis Sea Foods

Campgrounds

Family Affair Campground
Creekside Campgrounds
KOA Campgrounds
Tomes Campground

Appendix D. PENNSYLVANIA COUNTY OF RESIDENCE OF ANGLERS WHO FISHED
IN PENNSYLVANIA'S LAKE ERIE WATERS, 1981-1982

Table D-1. PENNSYLVANIA COUNTY OF RESIDENCE OF ANGLERS WHO FISHED
IN PENNSYLVANIA'S LAKE ERIE WATERS, 1981-1982

<u>Trade Area/County</u>	<u>Percent Of Anglers</u>
<u>Erie County</u>	65.35%
<u>Pittsburgh Metropolitan</u>	
Alleghany	11.33
Beaver	2.17
Washington	2.02
Westmoreland	2.41
<u>I-79 Corridor</u>	
Butler	2.10
Crawford	1.84
Fayette	0.58
Greene	0.21
Lawrence	1.62
Mercer	1.82
Venango	0.66
<u>Other Western Pennsylvania</u>	
Armstrong	0.77
Bedford	0.05
Blair	0.23
Cambria	0.70
Centre	0.13
Clarion	0.26
Clearfield	0.37
Elk	0.24
Forest	0.07
Indiana	0.41
Jefferson	0.27
McKean	0.13
Somerset	0.18
Warren	0.29
<u>Eastern Pennsylvania</u>	
Adams	0
Berks	0.05
Bradford	0.01
Bucks	0
Cameron	0
Carbon	0

Table D-1. PENNSYLVANIA COUNTY OF RESIDENCE OF ANGLERS WHO FISHED
IN PENNSYLVANIA'S LAKE ERIE WATERS, 1981-1982
(Continued)

<u>Trade Area/County</u>	<u>Percent Of Anglers</u>
<u>Eastern Pennsylvania</u>	
Chester	0
Clinton	0.06
Columbia	0.02
Cumberland	0.02
Dauphin	0.01
Delaware	0
Franklin	0.01
Fulton	0
Huntington	0.05
Juniata	0.02
Lackawana	0.03
Lancaster	0
Lebanon	0.01
Lehigh	0.05
Luzerne	0
Lycoming	0.03
Mifflin	0.02
Monroe	0
Montgomery	0.03
Montaur	0
Northampton	0.01
Northumberland	0.04
Perry	0.02
Philadelphia	0
Pike	0
Potter	0.04
Schuylkill	0.02
Snyder	0
Sullivan	0
Susquehanna	0
Tioga	0.03
Union	0.02
Wayne	0
Wyoming	0
York	0.01

Source: Pennsylvania Fish Commission and
Hammer, Siler, George Associates.

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