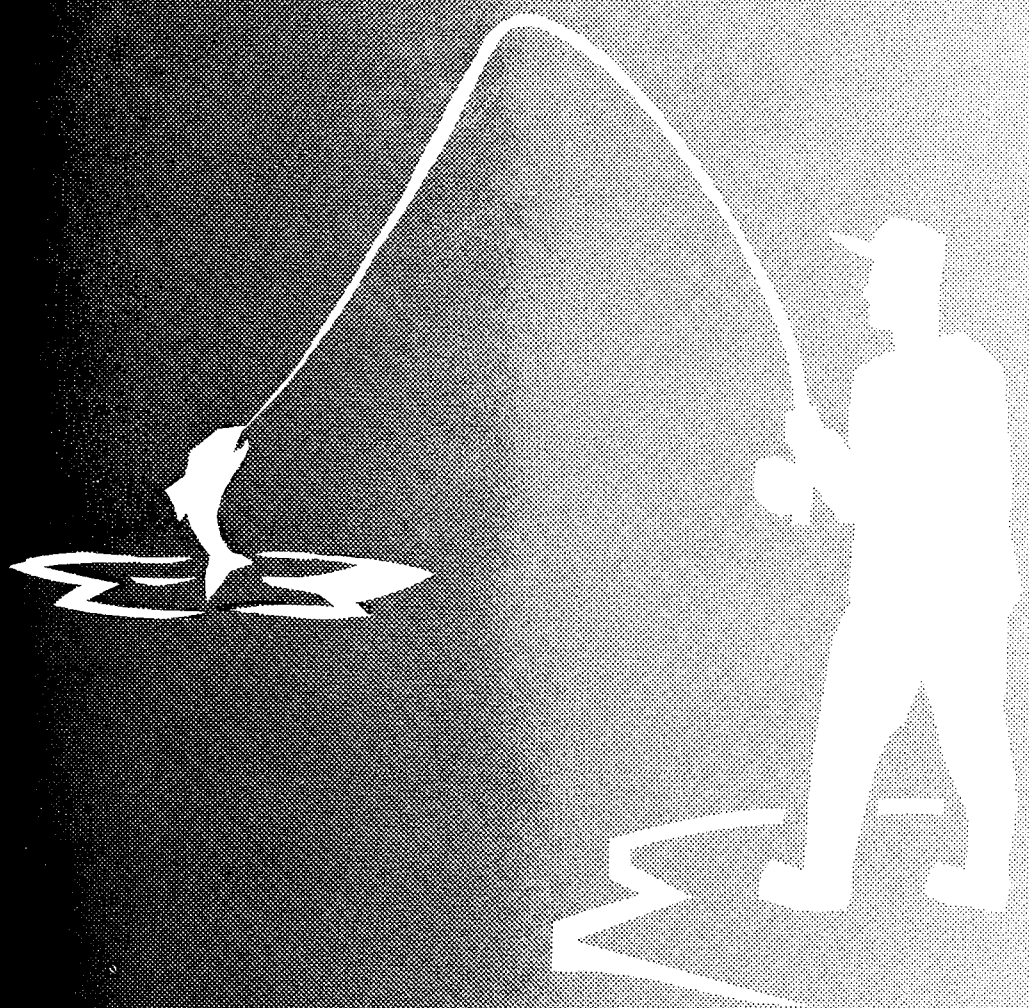
1971

STATUS OF MICHIGAN'S FISHERIES MANAGEMENT



MICHIGAN DEPARTMENT OF NATURAL RESOURCES · · · · · · · · · · FISHERIES DIVISION

Fisheries Management Report No. 4 February, 1972

STATUS OF MICHIGAN'S FISHERIES MANAGEMENT

1971

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Michigan Department of Natural Resources
Fisheries Division
Lansing, Michigan

PREFACE

This report, Status of Michigan's Fisheries Management - 1971, represents a year-end summary of Fisheries Division's activities and thinking. It also represents a compromise to thoroughness for the sake of timeliness. Emphasis is given to those areas which seem to us to be of greatest current concern to Michigan's fishermen.

It is in a very real sense a report to our stockholders, our fishermen.

WAYNE H. TODY
Chief
Fisheries Division
Department of Natural Resources

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FACTS ABOUT SPORT FISHING IN MICHIGAN

In 1970, 20,000 Michigan resident and non-resident sport fishermen were surveyed. The survey was accomplished by mail questionnaires which asked selected anglers to report their fishing activities. About 70 per cent of the anglers who received the questionnaires responded and the information has been very useful in understanding and planning fisheries activities. The following facts are taken from the 1970 mail survey except for a few items and comments from the incomplete 1971 survey, and some data on the fall run of salmon and steelhead in the Little Manistee River.

1. Approximately 1.1 million licensed anglers fished 15.4 million man-days in 1970.

2. In 1970, about 72 per cent (11.1 million man-days) of the statewide fishing effort (15.4 million man-days) was spent on inland lakes and streams, 16 per cent went on the Great Lakes, and 12 per cent of the effort was expended on salmon-steelhead tributaries.

3. The number and percentage of fishing days spent on each of the Great Lakes and salmon-steelhead streams in 1970 were:

Lake	Number of Angler Days	Per cent
Michigan	2,275,000	53
Huron	1,091,000	26
Superior	432,000	10
St. Clair	347,000	8
Erie	137,000	3
Total	4,282,000	

4. The approximate number and percentage of fisherman days expended on the inland waters of the three Department of Natural Resources administrative regions was:

Region	Angler Days	Per cent
I (upper peninsula)	977,000	9
II (northern lower)	3,600,000	32
III (southern lower)	6,500,000	59
Total	11,077,000	

5. Estimates of the pounds and numbers of fish caught by anglers in 1970 were:

	Pounds	Numbers
From the Great Lakes	19 million	31,000,000
From the Inland Waters	20 million	65,000,000
Total	39 million	96,000,000

6. The four groups of fish which produced the most pounds in the sport catch in 1970 were:

Panfish:	7.0 million pounds
Northern Pike:	4.5 million pounds
Suckers:	5.2 million pounds
Coho Salmon:	3.4 million pounds
Total	20.1 million pounds

7. The regional distribution of six popular groups of fish in the sport catch from inland waters was:

Fish Group	Region I	Region II	Region III	Total
Panfish	2.6%	22.3%	75.1%	100%
Northern Pike	20.7%	47.2%	32.1%	100%
Suckers	5.2%	41.7%	53.1%	100%
Trout	33.3%	54.1%	12.6%	100%
Bass	6.5%	27.4%	66.1%	100%
Perch	11.7%	39.7%	48.6%	100%

8. For the period January-June, 1971, the surveyed anglers told us the species for which they had fished. Please note that these data apply only to the first half of the year and, therefore, do not truly reflect the importance of salmon and other "late bloomers". Interestingly, 45 per cent of the anglers who lived in Region I said they fished brook trout, while 39 per cent of the fishermen who lived in Region II and 60 per cent of Region III anglers sought panfish; statewide, the panfish attracted the most anglers (54 per cent):

Residents of Region I, Upper Peninsula

Species Sought and Percent of Anglers Who Fished for Each		Species Sought and Percent of Anglers Who Fished for Each	
Brook Trout	45	Steelhead Trout	15
Smelt	32	Perch (Great Lakes)	15
Rainbow Trout	29	Panfish	14
Northern Pike	27	Coho Salmon	14
Walleye	27	Brown Trout	12
Lake Trout	26	Suckers	7
Bass	22	Chinook Salmon	2
Perch (inland)	21	Muskellunge	2

Residents of Region II, Northern Lower Peninsula

Species Sought and Percent of Anglers Who Fished for Each		Species Sought and Percent of Anglers Who Fished for Each	
Panfish	39	Perch (Great Lakes)	20
Northern Pike	33	Rainbow Trout	20
Bass	32	Smelt	19
Perch (inland)	28	Lake Trout	18
Brown Trout	24	Suckers	13
Brook Trout	22	Coho Salmon	9
Steelhead	22	Chinook Salmon	3
Walleye	21	Muskellunge	1

Residents of Region III, Southern Lower Peninsula

Species Sought and Percent of Anglers Who Fished for Each		Species Sought and Percent of Anglers Who Fished for Each	
Panfish	60	Rainbow Trout	13
Bass	48	Brook Trout	12
Northern Pike	31	Suckers	12
Perch (inland)	29	Smelt	11
Perch (Great Lakes)	22	Lake Trout	9
Walleye	16	Coho Salmon	8
Steelhead Trout	14	Chinook Salmon	3
Brown Trout	13	Muskellunge	3

Statewide Totals

Species Sought and Percent of Anglers Who Fished for Each		Species Sought and Percent of Anglers Who Fished for Each	
Panfish	54	Steelhead Trout	15
Bass	44	Brown Trout	15
Northern Pike	31	Smelt	14
Perch (inland)	28	Suckers	12
Perch (Great Lakes)	21	Lake Trout	10
Walleye	17	Coho Salmon	9
Brook Trout	16	Chinook Salmon	3
Rainbow Trout	15	Muskellunge	3

9. Percentages of anglers interviewed during January-June, 1971, who said they fished through the ice:

Region of Residence	Percent Ice Fishermen
I	34
II	52
III	50
Statewide	49

10. The 1971 experimental salmon fishery on the Sable River was interesting because of its high catch rate and because it demonstrated that a controlled fishery is both popular and practical. Fishing the lower Sable River in the Ludington State Park was by permit only, using flies, lures or bait with a hook size of 3/8 inch or smaller. Some 9,700 salmon were taken in 8,300 man-days of fishing between September 29 and October 14, 1971.

11. Average sizes of salmon and steelhead taken at the Little Manistee River weir in the fall of 1971:

Species	Mean Length	Mean Weight
Steelhead	27.3 inches	8.7 pounds
Coho (Age 3)	28.5 inches	8.7 pounds
Chinook (Age 3)	34.2 inches	16.5 pounds
Chinook (Age 4)	39.0 inches	22.8 pounds

12. The award for the best excuse for not catching fish went to the angler who penned the following terse comment on his questionnaire:

> "I was shocked to learn, after 1-1/2 days of fishing, that the lake had been poisoned."

INTEREST IN MICHIGAN FISHING AS REFLECTED IN LICENSE SALES

One of the best indices of public interest for sport fishing is the annual sale of fishing licenses. Michigan sells about one million resident licenses which represents approximately one-third of all eligible men in the State. Wives and children do not require licenses.

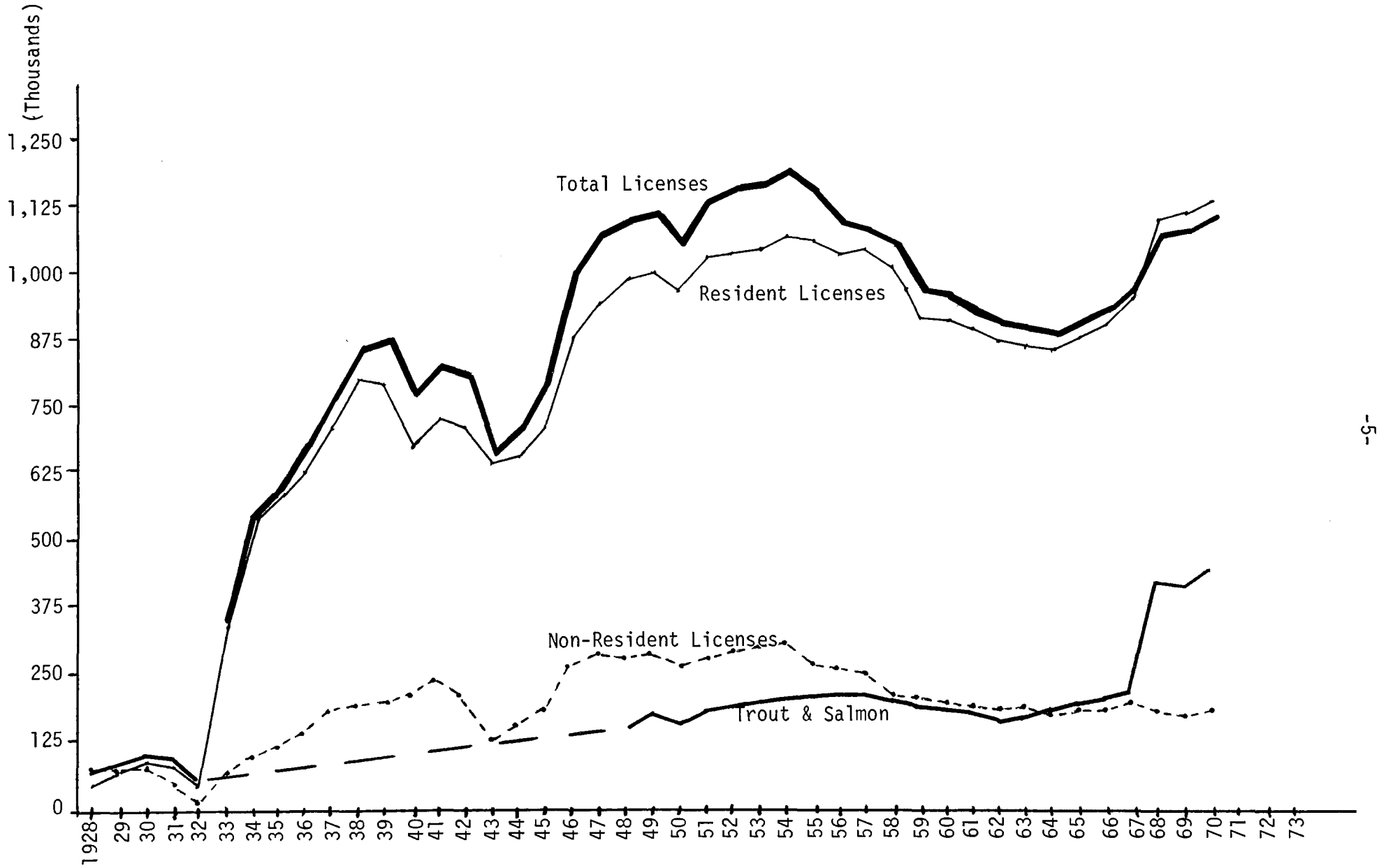
An accurate record of license sales has been kept since the license was initiated in 1928. Early participation in the fishery was limited. License sales rose steadily between the Great Depression and the outbreak of World War II. The decline in the early 1940's very specifically reflected the war's effect on our outdoor recreation. License sales soared in the postwar period reaching a peak in 1954. The 1955-64 period was one of decreasing interest in sport fishing.

We attribute this ten year decline to a saturation of fishing pressure on the inland lakes and streams. This situation was typified by public opinion that the quality of fishing had declined, but undoubtedly competitive factors such as private cottages, speed boats, water-skiing, and swimming contributed to the decline.

Since 1964 the decline in license sales has been dramatically reversed. In 1968 resident license sales reached a new high and new records have been set in 1969, 1970, and again in 1971.

This change can be attributed to new and vigorous State fisheries management programs and even more specifically to the introduction of Pacific salmon and the promotion of sport fishing in Great Lakes waters.

TRENDS IN MICHIGAN FISHING LICENSE SALES



The greatest increase in fishing license sales occurred in 1968 when a resident fishing license was first required to fish in the Great Lakes. The year 1968 marked the second season for coho salmon fishing in Lake Michigan. Most of the increase that occurred was reflected in the sale of trout and salmon stamps. The number of trout and salmon fishermen soared from 200,000 to 400,000 in 1968 alone. By 1970, some 450,000 anglers were eligible to fish trout and salmon in Great Lakes waters.

Surprisingly, the sale of non-resident licenses in Michigan has not kept pace with resident licenses. Until 1954, non-resident fishing activity appears to have followed closely the trend previously described for residents reaching a record level of 300,000 in 1954. Since then annual sales have declined to about 180,000. In spite of a slight increase in 1970 and 1971, sales remain about 35 per cent below peak levels. This situation is difficult to explain and I doubt if we have the real answers. Part of the decrease can probably be attributed to the combining of man and wife licenses in 1946. A greater share of the decrease, however, can probably be attributed to the fact that our inland waters are not as attractive to non-resident anglers as they were back in the 1950's. Large impoundments have been built in the populous states to our immediate south. It is our guess that non-residents are fishing Michigan Great Lakes waters at a rapidly increasing rate, but that this is cancelled out by a waning interest in our inland waters.

Michigan license sales reflect a tremendous popularity for the sport fishing opportunity. Somewhat over a third of Michigan citizens actively participate in this fine outdoor sport each year. For the last five years fishing has soared in popularity and each year now sets record levels thanks to the new fishing opportunities being provided in our vast expanse of Great Lakes waters.

DEVELOPMENT OF GAME FISH POPULATIONS IN MICHIGAN

Productive fish management practices change fish populations to improve fishing. We have been manipulating fish populations in Michigan since our Fish Commission was established in 1873. However, in the seven years from 1964 to 1971 fish management has had a more dramatic influence on the number and kinds of fish taken by anglers than in any comparable period in our state's history. We can expect that fishing opportunities will continue to expand at least through the remainder of the 70's due to intensified fish management, largely through hatchery stocking programs. Already over half the game fish harvested by Michigan fishermen are a direct result of this intensive management.

In 1964, most game fish populations in Michigan were supported by natural reproduction. Fish management was centered primarily on the put-and-take trout planting program which was costly and had very short-term effects on fishing success. The planting of trout in inland lakes came into its own in 1964, and it was the most successful fish management practice at the time. Warmwater fish management was largely directed at preserving the rapidly disappearing inland lake spawning marshes that

were vitally important in the reproduction of northern pike. Projects to eradicate rough fish populations and restock valuable game fish were focused primarily on trout.

A new program in fish management was outlined in 1964 in an effort to change the direction of the Michigan trend toward poorer fishing and fewer sport fishermen. By 1966 fish populations were responding to new management practices and fishing license sales were increasing for the first time in a decade. In 1971 more people fished and more game fish were taken by angling than during any previous year in Michigan's history.

Most of the fish management improvements in the last seven years have been with trout and salmon. The emphasis has been on these cold-water species for two primary reasons. First, techniques were readily available for artificially rearing trout and salmon at relatively low costs in existing hatcheries. Secondly, the development of the sport fishing potential in Michigan hinges on the successful management of our large, deep, cold inland lakes as well as our waters of lakes Superior, Michigan, and Huron. The species best suited for these areas are in the trout and salmon family.

The Great Lakes fishery rehabilitation program began with the stocking of lake trout. Sea lamprey predation and commercial exploitation had combined to nearly eliminate lake trout in lakes Huron, Superior, and Michigan. The lake trout restocking program has been successful; but it has been a slow and expensive success since lake trout remain susceptible to both sea lamprey and commercial gill nets despite management efforts to control both these causes of mortality. The lake trout's role in the Great Lakes fishery is also limited since it occupies and feeds chiefly in those areas of the Great Lakes 40 fathoms and less in depth--a very small portion of our total Great Lakes area.

New species were looked at to determine their potential role in the Great Lakes fishery. Coho were chosen for a number of reasons; but primarily because they were a fine open water predator fish and seemed to fit Michigan's needs. Hatchery techniques had been developed in the west for dependable hatchery rearing of coho, and eggs were readily available. Coho were expected to range throughout the open water of our Great Lakes utilizing the vast alewife supply in Lake Michigan. Coho have fulfilled all the management expectation and more. Their role in the future fishery is becoming more apparent each year as we become familiar with its advantages and habits.

Chinook were also chosen for introduction. They appeared to have an even better chance of success in our Great Lakes, but a supply of eggs for this species was not readily available, and the introduction of chinook into Michigan waters occurred one year after the first coho plants. Chinook are less expensive to rear in our hatcheries; they are planted after only six or eight months of culture versus eighteen months for coho; and they grow faster and larger than coho. Chinook, like coho, range throughout our Great Lakes in search of food; however, they have not yet produced a Great Lakes sport troll fishery to compare with the coho fishery. The river and river mouth fisheries for chinook have been

outstanding, and new planting locations or the importation of new varieties may be the key to the development of open water fishing for this trophy sport fish.

Using West Coast hatchery techniques, Michigan developed methods for raising steelhead in large numbers for stocking in streams tributary to our Great Lakes waters. While the wild steelhead is the same species as our domesticated hatchery rainbows, it has many characteristics which are distinctive and important to both fishermen and fish managers. In 1967, Michigan began a modest steelhead stocking program. By 1972, over one million steelhead will be planted in Michigan streams generating new steelhead fisheries equal to or better than those supported by natural reproduction in the Platte, Little Manistee, and Little Garlic.

Wisconsin led the way in the successful stocking of brown and domestic rainbow trout into the Great Lakes. These two species offer yet another type of fishing that is generally limited to the immediate area in which the fish are planted. Rainbows and browns planted in the Great Lakes grow fast and provide fishing for shoreline anglers in both the fall and spring periods. Michigan has made successful experimental plants of brook trout into the Great Lakes too, and although limited in application, these plants will offer Michigan fishermen trophy brook trout in selected areas.

While we anticipate that natural reproduction will complement fish stocking programs, the fishing success for lake trout, coho, chinook, steelhead, brown trout, rainbow trout, and brook trout in the Great Lakes will be largely dependent on number of fish reared in hatcheries and planted each year. In 1972, 3,000,000 coho; 3,000,000 chinook; 1,000,000 steelhead; 400,000 brown trout, 400,000 rainbows; and 3,000,000 lake trout will be planted. In addition, 100,000 special lake trout hybrids will be stocked in Lake Huron.

The Great Lakes program by its size and success has completely overshadowed significant accomplishments in the inland fish management program. Muskellunge, a few years ago a rare and endangered species in Michigan's inland waters, is now the number one trophy fish in several large inland lakes. This recent increase in muskellunge is a direct result of an intensive hatchery program. Warmwater predators like muskellunge, walleye, northern pike, and bass have been extremely difficult to raise to planting size in a hatchery. Unlike trout and salmon, warmwater predators could not be successfully raised on artificial food. Live plankton and small suckers had to be fed to these species. Even with innovative methods of obtaining and maintaining live food, the cost of artificially raising warmwater fish to planting size is high. During 1970 and 1971, intensive research was carried out to develop artificial feeding methods for warmwater fish. For the first time in Michigan, a few walleye, bass, and muskellunge were raised entirely on artificial feed. This significant breakthrough will soon be tried on a production scale and well may mark the beginning of a new era in warmwater fish management equal in importance to the trout hatchery success that dominated fish management during the first half of this century.

Planting of trout and salmon predators to control alewife abundance and the closure of commercial yellow perch fishing have combined to bring back the pier fishery on Lake Michigan.

Hybrid warmwater fish will offer versatility in management of our inland lakes. The tiger musky (a northern pike-muskellunge hybrid), for example, grows faster and is easier to raise in hatcheries than the muskellunge. Tiger muskies have been planted in several Michigan lakes and already support important new sport fisheries.

In addition to planting fish and chemically removing unwanted fish species, which are both direct control methods, fish managers can also affect the population of game fish by indirect methods. The yellow perch of Lake Michigan once provided good sport and food for tens of thousands of pier and breakwater fishermen from Benton Harbor to Petoskey. Commercial fishing and alewife population pressures decimated the yellow perch in Lake Michigan in the early 1960's. The planting of trout and salmon predators to control alewife abundance, and the closure of commercial yellow perch fishing have combined to help perch populations build in our waters of Lake Michigan. The perch pier fishery has already returned to many Lake Michigan port cities from Ludington south, and fishermen can look forward to even better fishing for yellow perch as the population expands.

Control of commercial fishing for northern pike has also improved sport fishing for this species in Saginaw Bay. We are hopeful that the commercial fishing closures on walleye in Lake Michigan and Lake Huron combined with a controlled alewife population will help rebuild populations of this once important Great Lakes sport fish too.

Regulation of the sport fishery can play a role in improving fish populations. While creel and possession limits help distribute the catch among more people, size limits directly influence the size of fish available to the fishermen. The recent ten inch size limit on trout, except brook trout, has protected young steelhead in streams like the Little Manistee and Pere Marquette before they migrate to the lakes. In inland streams and lakes, trout can now be stocked at a larger size to insure better survival and realize greater growth before they are creeled by fishermen.

All fish management efforts in the last seven years have not been as successful as the introduction of Pacific salmon. Kokanee salmon failed to produce a significant fishery in either Torch or Higgins lakes where they were stocked for several years beginning in 1965. Kokanee introductions have now been shifted to more productive southern Michigan lakes in hopes of providing new fishing opportunities. Experimental culture of the lake sturgeon, while making some progress, has not come up with a satisfactory method of artificially rearing this unique, endangered species. Our hatcheries have successfully reared small numbers of striped bass, but with the strong success of salmon and trout in the Great Lakes the role of this fine sport fish has become one of a hopeful stand-in. Michigan is ready to introduce Atlantic salmon on a small scale in 1972 using 20,000 smolts purchased from Quebec's Domtar Ltd., a private hatchery rearing salmon of Grand Cascapedia stock. Kokanee, lake sturgeon, striped bass, and other new species, hybrids, and varieties will continue to be experimentally reared and planted as long as they offer the potential for further complementing Michigan's fisheries.

Michigan has more fresh water available for fish management than any other state and this water is of exceptionally fine quality. Fish managers now have the technology to manipulate fish populations through direct and indirect controls to substantially improve fishing. By 1980, the Platte River Hatchery, the planned new coldwater hatchery, and existing trout rearing facilities will produce nearly 17,000,000 trout and salmon. As programmed now, 500,000 brook trout; 3,000,000 brown trout; 2,500,000 domestic rainbows; 300,000 splake; 500,000 lake trout; 4,725,000 coho; 3,200,000 chinook; 1,700,000 steelhead; and 250,000 Atlantic salmon will be available for planting in Michigan waters by 1980. Approximately 5,000,000 will be planted in inland waters and the remainder in the Great Lakes. In addition, federal hatcheries are expected to provide nearly 5,000,000 lake trout and hybrid lake trout for Michigan's Great Lakes waters.

The planned warmwater fish hatchery will have a major impact on fishing in our inland waters by 1980.

FISHING THE GREAT LAKES AND TRIBUTARY STREAMS

Although creel census data has not yet been analyzed for the last six months of 1971, several new fishing developments on the Great Lakes and their tributaries are worthy of general comment.

The Lake Superior sport fishery continues to be dominated by lake trout which provided good open water catches at Black River Harbor, Keweenaw Bay, Marquette, Munising, and Grand Marais. The winter lake trout ice fishery in Whitefish Bay expanded again last winter. Catches of large chinook in Lake Superior and its tributaries attracted new fishermen. Chinook are fast becoming more important than coho in Lake Superior.

Coho fishing in Lake Michigan in the early spring was complemented by the first significant lake trout sport fishery in southern Lake Michigan. For the first time, salmon fishermen were able to follow the coho in their northward migration throughout the summer.

Lake trout and chinook sparked an early August fishery off Manistee, Ludington, and Muskegon forecasting the important role these two species will play in lengthening the open water fishing season at northern ports. Fall coho fishing started earlier in northern Lake Michigan ports during 1971 and success during early September was extremely good off Manistee and Arcadia, and in Platte Bay.

The first substantial Lake Michigan perch sport fishery in a decade developed early in southern ports during 1971 and by August pier perch fishing was good at nearly every port north to Ludington. Management efforts to reduce alewife abundance through the planting of salmon and trout, and the closure of commercial fishing for yellow perch have combined to help perch populations recover.

The late fall coho salmon fishery spread to southern Lake Michigan ports of Grand Haven and South Haven in 1971 due to heavy salmon plants made in southern Michigan rivers during the last three years. The late

Everett Kircher of Boyne City, donor of 10,000 Atlantic salmon smolts for stocking in Boyne River, shown with 46 pound Atlantic salmon taken in Alta River, Norway.

fall and early winter lake trout fishery in northern Lake Michigan ports took on a new aspect. Pier fishing with spawn bags and lanterns has produced phenomenal results for lake trout at Charlevoix, and also at Petoskey, Elk Rapids, and Leland.

Lake Huron has been slow in developing. In 1971 the mediocre salmon fishery was overtaken by rapidly expanding brown, rainbow, and steelhead fisheries from Port Sanilac on lower Lake Huron to Cedarville in the upper peninsula. Rainbow trout plants made during 1969-70 supported new fisheries at Port Sanilac, Harbor Beach, Rogers City, Cheboygan, and in the Les Cheneaux Islands. Brown trout fisheries at Alpena in Thunder Bay and at Grindstone City at the tip of the thumb also produced new fishing opportunities. Steelhead fishing in both the Au Sable and Ocqueoc rivers was better this fall than it has been since the sea lamprey invaded Lake Huron in the 1940's.

The prospects for future Great Lakes and anadromous stream fisheries look even better. Lake Huron fishing, particularly for rainbows and browns, should come into its own in 1972. Many new fishing areas will develop and outstanding catches of large trout are expected. Steelhead, already at unprecedented abundance, should substantially increase statewide in 1972 as the full effects of a three-year-old stocking program are felt in many streams. Lake trout fishing should continue to improve from Manistee southward in Lake Michigan which may also help expand the open water catch of chinook. Experimental open water plants of coho off Ludington, Portage Lake, and Frankfort may spark better salmon fishing in this area of northern Lake Michigan.

Atlantic salmon smolts will be planted in the Boyne and Au Sable rivers (10,000 smolts each) during the spring of 1972. The first grilse are expected to return in the fall of 1972. Initially, Atlantic salmon fishing will be restricted to insure the survival of spawning adults for a supply of eggs. Atlantic salmon stream fishing is traditionally an extremely high quality sport. Michigan streams managed for Atlantic salmon will be chosen primarily for their ability to support a quality fly fishery.

RECENT CHANGES IN FISHING PHILOSOPHY AND FISHING INTERESTS RESULTING FROM IMPROVED GREAT LAKES SPORT FISHING

The abrupt development of salmon, steelhead, and lake trout sport fisheries on the Great Lakes and tributaries that occurred between 1966-71 has no parallel in the annals of sport fishing. A development of this magnitude cannot and did not take place without reshaping some of the attitudes and philosophies of Michigan sportsmen.

Hundreds of thousands of fishermen whose largest fish was a 10 pound carp or dogfish and whose dream was to some day catch a 5 pound bass, a 3 pound brown trout or 10 pound steelhead were suddenly catching limits of salmon, steelhead, and lake trout in excess of 10 pounds. Casual fishermen and novices who had previously had little or no fishing experience were initiated into this sport by catching fish of 10, 20, and even 40 pounds.

There were some growing pains in making this adjustment. Not content with the expanded opportunities the abundance of large salmon, lake trout, and steelhead offered when crowded into tributary streams, some fishermen insisted that the sport be made even easier; and, first at Bear Creek, and later at other sites the demand for snag fishing was heard. And, it was not denied for long to the chagrin of many sportsmen. Fish which were only yesterday beyond the dreams of so many anglers were soon being snagged with weighted treble hooks, hauled to shore on heavy line, and dragged away with callous disregard by the hundredweight. A limit of 15 pound salmon or 8 pound lake trout or 10 pound steelhead, once only the stuff one read about in outdoor magazines, were now going unphotographed. Some eager sportsmen were actually catching a ton or more of trout and salmon in one calendar year.

The reaction of these abrupt changes makes an interesting study in human behavior. Dedicated trout fishermen, content with pursuing their chosen sport, viewed salmon first as a threat to their favorite species but later as a general degrading influence on the sport of angling. A logician might seriously question blaming salmon for the sometimes gross behavior of man but, then, the entire field of sport fishing becomes questionable when examined in the light of cold logic.

Bass and bluegill fishermen and perch fishermen joined the trout fishermen in attacking the developing Great Lakes fisheries in charges that it (a) diverted money and attention away from their favorite inland sport, which it did; (b) threatened their favorite species wherever their range was invaded by salmon, which it didn't; (c) was just a big money making deal for the Department of Natural Resources (a non-profit organization); (d) stunk and caused pollution, which it did and didn't.

The last part of Item (d) is worthy of further explanation (the staunchest defender of the salmon program cannot deny the odor of the dead carcasses even though this concern seems a bit misplaced coming from fishermen). Salmon carcasses do enrich streams but pollution is too strong a term. Salmon (or any other fish that die of natural causes for that matter) do not put anything into our waters that was not there to begin with. Too, because they eat unwanted alewives and convert them into desirable food that is harvested from the Great Lakes system in large quantities (millions of pounds annually), they actually serve to remove accumulated nutrients from the system (just as farm crops remove nutrients from the soil). A rational concern for pollution should be focused elsewhere.

It is obvious that not all trout fishermen and bluegill fishermen were opposed to the development of Great Lakes trout and salmon fishing. Many did try and enjoy the new fishing and would be loath to give it up now in spite of having ideas on how it could be improved. This group seems to have a healthy open minded attitude toward their sport. How much effect this shift of interest from established inland trout and warm-water fisheries will have on the quality and intensity of inland fisheries is hard to predict. It is obvious that a shift has occurred, and it is likely that the shift will continue.

Finally, there are thousands of "new" fishermen who began fishing during the past five years and who neither share nor understand the fishing ethics and standards held by experienced fishermen. To them, fishing would not be the same without flotillas of white boats on the blue water of Lake Michigan, the heavy pull of a silvery coho, and even the rows of snaggers below Croton Dam. They have already learned to love the new Great Lakes fishing and will jealously defend their interests.

The new Great Lakes salmon and trout fishing does represent a change in sport fishing of almost frightening proportions. No one can envision exactly what is over the horizon. Because of the natural fear of the unknown, the program will continue to be subjected to a searching, thorough criticism from some quarters and an irrational rejection from others. Still others will welcome it on face value as a positive approach to improved fishing on the long neglected Great Lakes. The fishing itself in terms of sheer magnitude and quality is the best freshwater fishing the world has to offer. Most Michigan fishermen have adjusted to this new fishing quality with hardly a break in stride. Conflicts in fishing philosophy have been thrashed out as they have rarely been before. The most notable of those is the one surrounding snagging.

PROPOSAL TO RESTRICT SALMON SNAGGING FOR 1972

At the November, 1971, Natural Resources Commission meeting, the growing conflict between salmon snaggers and steelhead fishermen was discussed. This is not a new problem; in one way or another the conflict between salmon and steelhead anglers has been of concern for five years, and the problem of steelhead snagging is generations old. To avoid confusion, the resolution of this problem must be approached as a matter distinctly separate from the problems of littering and streamside damage that occur wherever large numbers of fishermen congregate (be they salmon snaggers, smelt dippers, or steelhead fishermen).

Most large streams in Region II receive heavy runs of salmon and steelhead beginning in September and extending through May. Salmon, being fall spawners, reach their peak abundance in October whereas steelhead numbers continue to build until their spring spawning season is underway.

By November 1 the salmon catch is well past its peak and the relative incidence of steelhead snagging increases sharply.

The timing of this waning salmon abundance coincides with the deterioration of the quality of salmon flesh and the onset of cold weather. As a result, salmon snagging effort declines abruptly. However, since it takes relatively few snaggers to disrupt steelhead fishing, the conflict between the two groups continues beyond November 1.

We propose to alleviate this conflict in two ways. First, we propose to allow snagging on only those rivers having large salmon runs and on

rivers and lakes where a conflict with steelhead or other species does not exist. Second, on salmon rivers having important fall steelhead runs, we propose to allow snagging during the months of September and October only (existing Commission rules allow snagging from September 1 through February 15) and only in specified areas below dams and bridges.

More specifically, our proposal is as follows:

Salmon snagging should be permitted from September 1 through December 31 on all streams south of the Muskegon and Rifle rivers, on the Great Lakes and all inland lakes through which salmon migrate. On the Muskegon, Sable, Manistee, Au Sable, Thunder Bay, Ocqueoc, Whitefish, and Falls rivers, salmon snagging should be permitted only during September and October in posted areas approximately one mile long below dams, at bridge crossings, and other appropriate locations. All other streams should be closed to snagging.

We are sure that this plan will allow nearly as many salmon to be taken by snagging as before while encouraging and increasing the conventional catch of both steelhead and salmon.

This proposal is expected to draw public comment and it will not be put before the Natural Resources Commission for formal approval for several months to allow time to analyze these comments.

Local snagging problems such as occurred on the Leland River with lake trout can be expected to continue to crop up unpredictably. These will be dealt with on an individual basis.

INLAND TROUT PROGRAM

Lakes

Our trout stocking program in lakes is based on the capacity of these waters to support and allow good growth of planted trout. Trout are not stocked to provide put-and-take fishing nor are they stocked where growth and survival conditions are poor.

Trout are stocked annually in approximately 225 lakes and ponds. They are the dominant sportfish in about half these (our designated trout lakes), but the remaining waters contain populations of other fish to which trout are added as a bonus. The latter, our so-called two-story lakes, are typically planted with yearling (5-7 inch) rainbow trout although browns are stocked in a few lakes where fishing pressure is unusually high or where experience has shown brown trout to give better returns.

Designated trout lakes are managed a bit more intensively for trout. When rough fish, minnows, or warmwater species become abundant to the point where trout growth and survival suffers, the lakes are chemically rehabilitated--all fish are killed--and restocked with trout. Approximately 20 such treatments are carried out annually on lakes ranging from less than an acre to over 300 acres in size. Because the fish populations

are thus controlled, trout can be stocked at a smaller size (2-4 inches) than in two-story lakes and with good success.

In addition to stocking and chemical treatment, trout lakes are surveyed and studied occasionally to keep tabs on their fish populations and on fishing and habitat conditions. Data gleaned from these surveys form the foundation of a whole host of management decisions.

Habitat work on lakes is basically habitat protection--protection against pollution and unwise filling and dredging. Though generally unseen and unsung, efforts toward habitat protection are crucial to our future trout lake management.

Though administration of the access site program now rests chiefly with the Department's Waterways Division, selection of access sites primarily for fishing still rests with Fisheries Division and this is a continuing program.

Streams

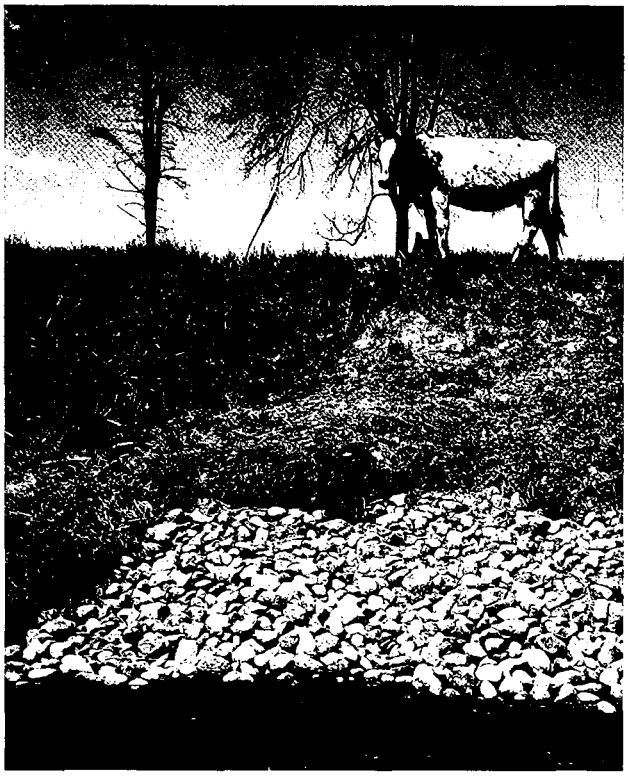
Trout streams, besides falling into obvious size categories, can be classified into two basic groups. The first is our top quality trout streams. These streams have everything a trout stream should have--clean, cool water, adequate spawning areas, and if competing fishes are present, they are not a serious problem. Management efforts on these streams rarely include stocking but run heavily to habitat protection and stream improvement. These are our most precious aquatic resources and they must be jealously guarded against pollution, over-grazing, dam construction, dredging, and other forms of abuse. These efforts, because they show no "improvement" are often overlooked. But a good trout stream is difficult to improve, yet easy to destroy.

The second stream category is termed second quality trout streams. Some factor, or factors, such as insufficient natural spawning, competition of other fish species, warm summer temperatures, low gradient or perhaps pollution keep these streams from efficiently producing trout on their own.

This is not to say that they do not provide good trout fishing--only that with help they can produce considerably more. The Betsie River in Benzie and Manistee counties is a good example. It naturally produces some trout fishing, in fact, it produces some very nice browns above Homestead Dam and rainbows below. However, it also supports an abundance of other fishes that sap its potential and trout reproduction is inadequate. In 1965, the Betsie was treated with rotenone to kill its entire fish population and it was restocked with trout. During the following four years the Betsie produced some of the finest trout fishing in the state. The middle section of the Manistee River treated in 1966 has a similar history, as does the Rogue near Grand Rapids and a whole host of lesser known southern Michigan streams. This program shows great promise and will be continued.

Sometimes such drastic measures are not needed. If inadequate spawning is the problem, and opportunity for good growth of planted trout exists, good results can be gained by simply stocking. Many cool upper

Protection and improvement of trout habitat is an important responsibility.



peninsula streams with low gradient respond well to the stocking of 3-4 inch brook trout and some of the sandy southwestern Michigan streams can be greatly improved by stocking 4-6 inch brown trout.

Large streams such as the Muskegon below Croton, the White near Hesperia, and the lower Pere Marquette can provide impressive fisheries with the help of stocking.

Some obvious habitat improvements have been made on trout streams in the past and these have been well received by fishermen. Log covers, bank stabilization with rock rip-rap, stump holes are all familiar products of stream improvement work. In the mid-1960's this work was all but dropped because of higher priority projects. More of this work is being done now.

A thorough improvement project is being completed on the Betsie River and the South Branch and North Branch of the Au Sable have received some improvement in the past two years. Stream improvement work will expand as funding increases. Plans are being drawn up for the Pere Marquette and upper Manistee and more of the Au Sable. Others will follow.

Many of Michigan's trout waters head at natural lakes which contribute warm water and undesirable fish. Some of these lakes are deep enough near their outlet so that the installation of a deep-water outlet pipe and control structure could contribute cold, rather than warm, water during the summer. This technique will not only improve existing trout streams, but will actually add trout water where there was none before. A pilot program will be undertaken soon.

Improvements will be made in our trout stocking program, too. For better survival, better fish, we will improve our planting stock by genetic manipulation and the use of wild brood stock. Through evaluation of various projects our planting programs will gain efficiency--the cost of producing a trout to the angler will become relatively less.

WARMWATER FISH PROGRAM

The removal or thinning out of a troublesome fish population through chemical treatment creates the void needed to re-establish good growth conditions for game fish. Outside of hatchery stocking programs, chemical reclamation is the single most important tool to fish managers in the rebuilding of desirable fish populations. Although fish toxicants have been used for many years, new concerns have been expressed in some areas of the country that the chemical reclamation of fish populations may be destroying "native" fish populations including endangered species; and that it further contaminates our environment.

Fishery biologists have been one of the groups that have been yelling the loudest and longest about contamination of our aquatic environment and the need to protect endangered fish species. While it is possible that these same biologists would have ignored their own use of chemicals, it is simply not the case. Many chemicals were used in

Rehabilitation of unbalanced lakes with chemicals followed by restocking is a continuing program.

the past by fish managers to eliminate unwanted fish, to control aquatic weeds and algae, and to treat fish diseases.

Those chemicals which do not meet the stringent requirements and screening test established by new federal law have been discarded. Some, like the fish toxicant toxaphene, were banned for use in Michigan several years ago by biologists themselves who felt the chemical was too persistent in the environment.

Only two fish toxicants are presently used in Michigan--rotenone and antimycin. Both these chemicals are quite selective to fish in the concentration used and are relatively short lived in the environment. A third chemical, TFM, is used by the federal government to control sea lamprey in streams in Michigan. This chemical is selective to lamprey and even other fish species are seldom affected. All information to date indicates TFM rapidly breaks down in the environment; however, the Great Lakes Fishery Commission is currently investing over $600,000 to test any possible environmental effects of this chemical and they will meet all registration requirements of the Environmental Protection Agency.

Fish toxicants are normally used by fish managers when man has sufficiently altered the composition of a fish population as to render it nearly useless. Between 1880 and 1920 fish managers and the general public introduced new species and extended the natural range of others without any concern or knowledge of the ultimate impact on fish populations. The range of both bluegills and perch were extended far beyond their natural range. Carp were introduced and often dominated native fish populations particularly when pollution favored the more tolerant fish. Environmental damage, introductions, and fishing pressure have combined to change many if not most of our fish populations in Michigan lakes and streams. Those few lakes and streams in which fish populations have remained unchanged are vigorously protected in their natural state whenever they are in public ownership. The Sylvania lakes in the western upper peninsula are a prime example.

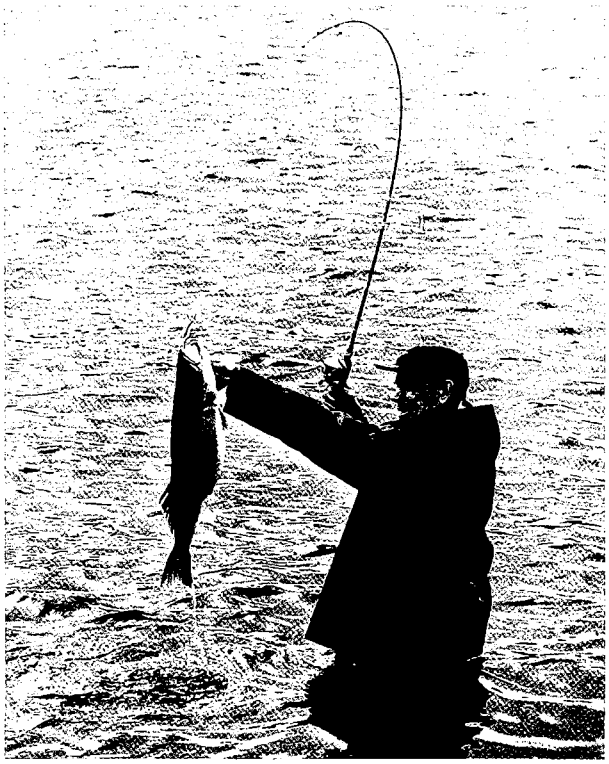
When fish managers chemically treat a lake, they do so to rebuild fish populations that fishermen have determined to be valuable to them.

Chemical rehabilitation and restocking offers the best hope of rebuilding game fish populations in lakes over-populated with panfish and in what were once polluted streams and impoundments. Coarse fish now dominate these streams and impoundments that were once badly polluted but which now are well on the way to becoming high quality water again. Coarse fish species will continue to dominate these waters unless they can be removed to allow planted game fish a chance to grow and reproduce.

Predator Fish Stocking, Pike Marshes

The stocking of predator species such as muskies, walleye, and northern pike strikes out at the problem of overcrowding of panfish, but, in addition, it injects an important element of quality to the overall warmwater program. Pike spawning marshes are a replacement of the natural marshy areas that have been filled by cottage development around our best lakes. Besides their natural scenic value and value for duck

New warmwater hatchery will help improve walleye and muskellunge fishing in inland lakes.



nesting, they provide vital spawning facilities for pike. And pike are not only a popular game fish, but as predators they play a role in maintaining a healthy panfish population. Nearly 50 pike marshes exist on Michigan lakes now and three new ones are approved for construction (Cadillac Lake, Wexford County; Secord Lake, Gladwin County; and Center Lake, Jackson County).

Inventory

Netting surveys and creel checking of warmwater lakes are important in that they are the basic tools from which management decisions are made. For example, fishing regulations are commonly dictated by the results of such inventories and although they are not often thought of as such, regulations are in themselves a basic tool of management. If too strict, regulations unnecessarily limit angling opportunity and if too liberal, overfishing can result. Information gained from our netting and creel census activities on Lake St. Clair resulted in a major change in the muskellunge season in 1969. A move such as this one that affects the world's most famous muskellunge fishery obviously must be based on fact--fact that only inventory work will provide. Stocking recommendations, introduction of new species, chemical treatments, and habitat protection all have their roots in some form of inventory. It is no wonder that so much effort is devoted to this activity.

New Hatchery Plans

Plans for the future are geared to the same problems that face us today--too many small panfish and rough fish and not enough sizeable panfish and gamefish. We know what causes this situation, but time, money, and techniques are inadequate to cope with a problem of this magnitude. Planting or encouraging predator fish, for example, is a good tool but our hatchery capabilities fall woefully short of the need. New facilities proposed for construction will increase our statewide hatchery production of warmwater predators by over ten-fold after 1975. This will allow the creation of the equivalent of 50 new 1,000 acre walleye lakes plus 50 new 1,000 acre musky lakes. "New" lakes will not get all these fish, of course. Many of our existing walleye and musky lakes will be improved by supplemental stocking.

URBANIZATION AND CONFLICT OF USE ON INLAND LAKES

There was a time and not too many years ago, when the smaller inland lakes of the State were placid and quiet. The use of these lakes was, by tradition, fishing. They were for the most part surrounded by woodland and farms. Today, due to urban sprawl and more powerful outboard motors, this picture has drastically changed.

With the advent of better highways, coupled with the deterioration of the cities, many families have left the city for lake living. The summer cottage concept has been replaced by the year-round home, with the entire family available to use the lake for recreational pursuits all day, every day of the summer season. These people, to a large degree, are

oriented toward motorized recreation--and they exhibit affluence when we consider that the building sites for their homes run from $200 per front foot on lakes in Oakland County to $300 per front foot on Gull Lake in Kalamazoo County. Fishing with a cane pole from a small rowboat holds little appeal to these people. They are a new group; they have new ideas in recreation. These center around the larger, higher powered motorboats with attendant high-speed cruising and water-skiing.

Urbanization in other forms contributes to pressure on our lakes. While frontage on lakes is now at a premium and in some cases simply not available, many "extra legal" riparians are created by the platting of property near lakes, with access guaranteed through a lake lot owned by the property developer. As an example, one 68 acre lake 15 miles from a metropolitan center has 829 platted lots.

While we know that motorboat registration approaches 500,000, we also are aware of 978,000 fishing licenses. The very fact that a bluegill fisherman sitting at anchor needs only the amount of water surface that his boat floats on, while a boat towing a water-skier needs at least 60 acres a minute, brings us to an irrefutable conflict between the two users, when both are using a small lake. The fisherman continues to exercise his traditional privilege of fishing under license for the esthetic and sporting values and the food product, regardless of the actual quality of the fishery and the speed boater pursues his licensed operation for what it is worth to him.

When the problem became apparent in the early '50's, it was solved by agreement among property owners and in some cases by local units of government, by ordinance--if it was solved at all.

In practical use these methods of dealing with the problem failed. The "gentleman's agreement" failed because it didn't apply to all of the users of the specific body of water, that is, guests of riparians and the general public having access to the lake. The agreement broke down also whenever recreational pursuits changed.

Recreational boating as we know it today is a relatively new art and local units of government, such as the rural or newly urban townships lacked the expertise to ordain in this area. Consequently, their boating ordinances often went beyond boating, were unenforceable and lacked the uniformity necessary to control the boater, who by virtue of the trailed boat, is largely transient.

The Legislature took note of the local control problem with the boating act. Act 245, P.A. 1959, spoke to local controls by voiding all previous actions by local units of government and preempting this field to the State. This was reiterated and refined by Act 303, P.A. 1967, the present Marine Safety Act, with rule making authority placed in the Natural Resources Commission and the function placed in the Department of Natural Resources, Marine Safety Section, Law Enforcement Division.

The part of the Marine Safety Act that covers Special Local Watercraft Controls specifies that a need for special controls must be

established under questions involving public safety and compatible use of the waters of the State. These two justification factors go hand-in-hand to resolve the conflict of interests on the smaller lakes.

The system for establishment of special local watercraft controls is dictated by the Marine Safety Act and Administrative Procedures Act. When a complaint of incompatibility or conflict between fishermen and other boaters is received by the Marine Safety Section, they habitually refer the complainant or complaining group back to their local unit of government for initiatory action, even though the Department may initiate such action.

When a resolution is received from a local unit of government asking for boating controls, an investigation of the lake is started and in most cases a public hearing is held to secure as much background of the problem as possible. This first hearing is inquisitive in nature and is not required by statute, but serves a good purpose in venting some of the complaints that have built-up in these situations.

When the investigation is completed, two determinations are made. First, has a need for a special local control been established? Should the facts indicate a lack of need for a special rule, the matter is referred to the local law enforcement people for corrective measures under existing laws. Second, has a need for a special rule been established? If so, a corrective rule is formulated, with a strong consideration for statewide uniformity. After this, the proposed rule is submitted to the Natural Resources Commission for tentative approval. After being tentatively approved, the rule is aired at the required public hearing. The rule is now turned over to the local unit(s) of government in which the subject waters lie. They may either reject or accept the recommended control. The Marine Safety Act provides for positive action by the Department of Natural Resources if the local unit of government is silent beyond 30 days.

Silence, for the purpose of placing the responsibility for ultimate decision on the Department of Natural Resources is rare, as the same pressures that cause rejection also cause action. Rejection of recommended rules by local units of government is not common.

As riparians, fishermen appear at public hearings to protect their interests, but as transients to a body of water, they rarely appear to present their views.

At the present time, three basic controls have been found effective in either protecting fishermen or resolving the conflict of interests.

1. Hours for high-speed boating and water-skiing. These are standard statewide from 10:00 a.m. to 6:30 p.m. and provide a fair share of daylight hours exclusively to the fisherman and slow-speed boater. For obvious reasons the rule broadly prohibits the towing of a person on <u>any</u> device, except from 10:00 a.m. to 6:30 p.m. These controls are well accepted and apply to lakes considered large enough for safe high-speed boating.

2. Bays and small basins of lakes that are too small to safely support high-speed boating are zoned to provide a safe, quiet anchorage for fishermen. Such areas are designated as either slow--no wake zones or areas where high-speed boating and water-skiing are prohibited.

3. On very small areas or on the entire surface of lakelets, the speed of vessels held to slow--no wake furnishes an adequate degree of protection for the anchored fisherman, who, even though he complains of the wake of others, frequently becomes a high-speed boater when coming to or leaving the fishing grounds. Another control which works well to benefit the anchored fisherman is a flat prohibition of high-speed boating and water-skiing on the entire surface of small lakes.

Special local watercraft controls are enforced for the most part by officers of the county sheriff's marine patrols; they receive specific direction from the Marine Safety Act in this. They may also be enforced by any duly authorized peace officer acting in his proper jurisdiction. These officers may enforce any and all of the provisions of the Marine Safety Act and any rules made under the Act's authority. This includes Conservation Officers.

Up to December, 1971, there had been controls of this type established on 178 lakes of less than 200 acres. These have generally come to the attention of the Marine Safety Section because of conflict of interest between high-speed boating enthusiasts and fishermen, however, in some cases a ruling would have been decided on safety considerations alone, in the case of very small lakes.

These special rules have a history of being well accepted and doing the job for which they were intended. Those people who may not have been in favor of the rule when it was first introduced to them, changed their boating habits to conform to the compromise. There have, of course, been some people who have moved to other bodies of water in order to continue to enjoy their particular sport.

Also of interest, the special local watercraft controls have been found enforceable by the enforcing officers and have stood the tests of our courts. While the local unit of government initiating the action and subsequent rule, may ask for re-examination, they have not done so.

It has been the policy of the Marine Safety Section to examine each body of water strictly on its own individual merits and not to apply blanket prohibitions based on broad all-inclusive criteria. The aim has been to provide as much recreation as possible and to allow a broad spectrum of water uses whenever and wherever possible.

It is likely that in future actions it will be necessary to enact broader and more stringent controls as water usage intensifies. Our waters are limited and with rare exception there is very little creation of new waters through impoundments. In spite of this, vessels increase in number, fishing license sales continue to increase, and time available for recreation also becomes more available.

Fishing will continue in popularity, with a projection of a $500 million expenditure for equipment in the 1980's. Boating expenditures are forecast at the $2-1/2 billion level and we will still have water-skiers, with them putting out about $250 million for the sport (each of these outlays are on the national level).

STATUS OF COMMERCIAL FISHING

Beginning in the 1820's and continuing until the mid-1960's the Great Lakes fisheries resources were aggressively pursued and exploited by generations of commercial fishermen. The resource was virtually free and available to be exploited--and exploited it was because no meaningful controls regulating harvest were ever successfully applied. All attempts toward regulation were frustrated by effective and well organized industry lobbyists.

The composition of fish stocks existing early in Michigan's history bear slight resemblance to that which exists today. As one stock was fished down, the fisheries shifted to a new area or species and the process repeated--usually accompanied by technological improvements which enabled fishermen to increase their catches.

Following World War II the nylon gill net was introduced into the Great Lakes commercial fisheries and had a profound and lasting effect on the resource. This gear was cheap, light, required little maintenance--and most importantly--was highly efficient in ability to catch fish. Unfortunately, the gill net is highly non-discriminatory and lethal. It catches and kills lake trout and other salmonids just as readily as it does whitefish, chubs, or lake herring; and where these species exist together, they will be caught together.

In 1967 when it became obvious that hatchery plantings of lake trout were showing heavily in the gill net fisheries for whitefish, chubs, and herring--commercial fishermen offered to demonstrate that the gear could be fished in a manner which would avoid catching large numbers of trout. During 1968-69 research permits were issued for the use of the nets inside 40 fathoms and the fishermen's operations were carefully monitored by Department personnel. The results were conclusive--gill nets set for whitefish and chubs caught excessive numbers of lake trout and posed a threat to the entire Great Lakes rehabilitation program.

In 1967 stocks of coregonid fishes such as whitefish, chubs, and herring were fast becoming depleted; and perch, walleyes, and sturgeon were seriously threatened.

Legislation was enacted in 1968 granting authority to the Director of the Department of Natural Resources to limit the number of commercial fishermen and to apply direct controls over the harvest of fish from the Great Lakes. In 1970, entry criteria were applied which reduced by half the number of commercial fishermen fishing the Great Lakes; and the Zone Management Plan applied direct controls over the areas and depths that could be fished, species that could be caught, and type of fishing gear permissible for use.

The Zone Management Plan placed stringent controls on the use of gill nets in zones managed for stock rehabilitation and in areas set aside for development of the sport fisheries. To a large extent these controls have prevented further deterioration of some commercial stocks; and have protected hatchery-planted salmonid fishes in both the sport fishing and rehabilitation zones.

Commercial fishermen's opposition to these controls has crystallized in the form of court challenges to the Director's authority, flagrant violations of rules, and undying dispute of the biological data supporting the controls. This opposition has met with equal resistance on the part of the biologists in their efforts to effect meaningful controls over harvest. As a consequence, administrative and management commitments by the regulatory authority have been out of all proportions to the benefits derived from commercial fishing.

Stripped of its many complications, management of the commercial fisheries still centers around optimum yield and utilization of the resource--particularly where stocks are commonly required by both sport and commercial fisheries; the use of gill nets versus selective gear; and derivation of optimum benefits to citizens of Michigan. These merit some discussion and consideration. Let's first take a look at the resource base.

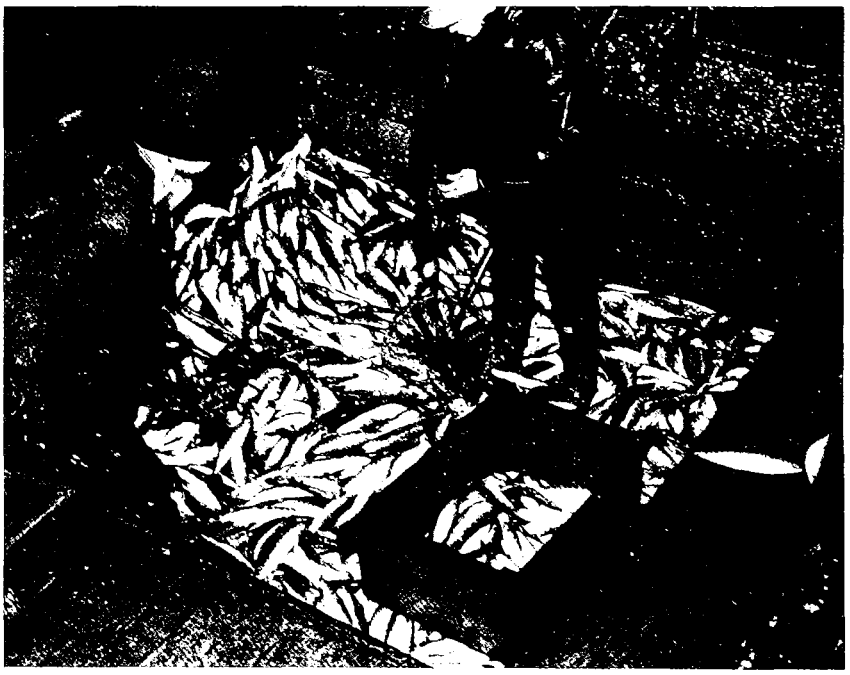
The Great Lakes are cold, clear, deep, and relatively infertile bodies of water. Fish are not evenly distributed from shore to shore and top to bottom. Indeed, most fish are produced in waters shallower than 200 feet in depth. Historically, these are the areas that supported commercial fisheries and they are the areas that are now furnishing most sport and commercial fishing. This relatively narrow band of shallow water associated with our shorelines will play the dominant role in providing fishing in the future for virtually all species of fish. As the sport fisheries develop, they will expand to new areas and there will be conflicts with the commercial fisheries unless a rational scheme of utilization is followed. The conflict now and in the future is largely one of the use of non-selective gear--gill nets--by commercial fishermen. If commercial fisheries are to be a positive force in the Great Lakes, they must utilize more selective fishing gear.

To be sure, there are other difficulties but the essential problem to resolve now is the matter of converting the large gill net fishery to a much smaller fishery utilizing selective fishing methods.

Traditionally, coregonid species such as whitefish, chubs, and herring have supported the commercial fisheries. Significantly, these species are extremely vulnerable to fishing. Depletion and in some cases, extinction, has occurred in stocks of coregonids not only in the Great Lakes, but elsewhere in the world. It's important, too, that while the coregonids are valuable table fishes, they serve a vital role as food for predatory trout and salmon with which they are closely associated throughout the Great Lakes. Hence, restoration of depleted stocks will benefit both the sport and commercial fisheries.

Of the three major stocks of coregonids, whitefish seem to be responding to a limited reduction in the use of gill nets since 1968.

The State's commercial fishery has experienced a long history of economic and biological decline.



Large catches of Great Lakes fish can be restored provided the State's commercial fishery is managed rationally and for the benefit of all citizens.

In the past decade whitefish landings reached a low of slightly over a half million pounds, but have gradually increased since 1962, and will probably reach three million pounds in 1971. Landings of five to six million pounds by 1975 are probably attainable.

Selective commercial fishing gear such as trap nets and pound nets from which sport fish can be returned to the water alive, now account for over half the total catch of whitefish. These nets can adequately harvest whitefish from the Great Lakes and they are less wasteful. There is no need to continue pursuing whitefish with non-selective gill nets which stifle sport fishing in the areas where they are used.

Unfortunately, stocks of chubs and herring are on the decline and probably won't recover in the next five years. All are harvested by means of deep water gill nets. There is no justification for harvesting a species that cannot be marketed.

The lake herring is nearly extinct in lakes Huron and Michigan; and production in Lake Superior has fallen from seven million pounds in 1961 to 700,000 pounds in 1971. There is no room for further commercial harvest of lake herring.

The situation with chubs is just as grim. Most of the chubs in Lake Michigan, where nearly all the production is taken, will not meet food standards for DDT and other pesticides.

The future of herring and chubs is unclear. If they recover and if most of future yields are not required to complement the forage base for predatory fishes, some could be taken for the commercial markets by gill nets in carefully selected areas and depths. To be sure, however, there will never be a place again for the large gill net fishery that exists now.

Other species on which the commercial fisheries depend include alewives, carp, catfish, smelt, suckers, and perch.

Because of their great abundance alewives and smelt command a low price on the market and are primarily utilized for animal food. Nearly all alewives are harvested selectively with trap nets, pound nets, or trawls; and the same applies to the harvest of smelt. Future yields can be taken by these methods and there is little need to even consider a gill net fishery for the two species. However, smelt and alewives are very important and valuable as a forage species for trout and salmon and smelt support an important sport fishery in their own right. The small economic return these species bring as animal food does not justify continued large-scale harvest for that purpose.

At present most of the carp harvested in the State come from Saginaw Bay and most of the catches (75 per cent) are taken by means of extra large mesh (8-9 inch) gill nets. The remainder of carp are harvested by seine and impounding nets. While the gill nets pose no immediate problem, they should be monitored carefully to protect northern pike and walleye populations in Saginaw Bay. Limited stocks of carp elsewhere in the State can be harvested by gear other than gill nets.

Nearly 70 per cent of the catfish and over 80 per cent of the suckers produced in Michigan waters are taken via impounding gear and these species can be adequately harvested with this gear exclusively.

Perch are closed to commercial fishing throughout the State except Saginaw Bay and Lake Erie. The catch in 1970 was split about equally between small mesh gill nets and trap nets. Gill nets will be banned in Saginaw Bay beginning in 1972, so a large part of the overfishing of perch stocks there has been resolved. As the perch start to come back, and by all measurements they are in many parts of the State, harvest could be shared by both commercial and sport fisheries--a desirable goal; and substantial commercial quantities could clearly be taken by means of impounding gear.

The transition from gill nets to impounding gear will be difficult for commercial fishermen to accept, principally because fisherman have always been free to fish in any manner they pleased. Change involving restrictions on one's livelihood is particularly difficult to accept. Persistence in that view has put them on a collision course with sport fishermen, however, and is inconsistent with optimum management of the fisheries resource.

Several other difficulties involving the commercial fisheries warrant some mention because they are subjects of some considerable pondering.

The first deals with a problem of marketing. Nearly 75 per cent of the fish caught in Michigan are exported from the State and included in this is most of the valuable whitefish production. Compounding the problem is the fact that commercial fisheries management, administration, and law enforcement exceed license revenue by about 15 to 1. To put it another way, Michigan citizens are not getting much back on investment dollars spent on their commercial fishery. A reasonable goal, seemingly, ought to be to put more fish in Michigan markets even though some may have to continue to be exported. To solve the problem will require giving some marketing assistance to the fishermen; perhaps regulations limiting exports; but equally important, a genuine effort on the part of fishermen to try and place their product in local markets.

Presently, for a minimal license fee, a fisherman may take unlimited quantities of a publicly-owned resource. Contrasted with the sport fisherman who has limits placed on his catch, this hardly seems like an equitable situation--particularly since sportsmen are paying for management of the commercial fisheries.

Commercial fishermen should be allotted a catch quota and that they should return some portion of the sale price to the State to help cover management costs.

Citizens of Michigan are realizing only small returns for their large investment in the commercial fisheries. This must be turned around and an equitable system of harvest and utilization established that will do service to our citizens and to a most unique resource--the Great Lakes.

THE FISH MANAGEMENT IMPLICATIONS OF PCBs AND OTHER NEW CONTAMINANTS

The Department of Natural Resources has been aware of the potential problem of PCB's (polychlorinated biphenyls) in the Great Lakes for two years. Our Department has supplied fish samples to the Pesticide Research Center at Michigan State University and the Bureau of Sport Fisheries and Wildlife at Ann Arbor. Both of these laboratories have carried out research projects related to PCB's. Their research was initiated because these compounds are closely related chemically to DDT and can be mistaken for DDT during laboratory analysis.

The concerns surrounding PCB's stem from the fact that they are very persistent in the environment, and are subject to biological magnification; that is, fish and other aquatic organisms concentrate the material both through the food chain and directly from the water.

On the basis of acute toxicity, PCB's are severalfold less toxic than DDT or for that matter almost all chlorinated hydrocarbon pesticides commonly used. Environmental investigators, however, are concerned that even though they have a relatively low toxicity, the effect of PCB's on fish and on birds that feed on fish, may be additive to the known effects of DDT and other compounds on these animals.

The United States Food and Drug Administration's concern for both DDT and PCB's in consumer products is related to the chronic effects that compounds may have on humans after long-term exposures.

Approximately one year ago, the Food and Drug Administration established a 5.0 ppm action level for PCB's in fish. This is the same level that has been established for DDT. The 5.0 ppm action level on PCB's apparently is based on 1/100th of the no effect level as determined by the FDA in laboratory test animals. This safety factor of 100 is commonly employed to provide a large margin of safety when extrapolating safe levels for test animals to humans.

The Department of Natural Resources shares the concern of many scientists over the effects of PCB's on the quality of our environment and our fish and wildlife resources. The Department also recognizes the efforts of the FDA to provide the highest possible standards for our consumer products. However, we question whether the current approach to environmental contaminants will solve the problems. PCB's are not the first environmental contaminant to create a problem, nor will they be the last. Each new problem creates a crisis and further erodes public confidence in the ability of public administrators to cope with the situation. Without the confidence of the public, we cannot hope to adequately fund or administer needed water pollution control programs.

Our Department feels there is an alternative to the present approach to environmental contaminants which should involve a change in the way the Federal Government handles these issues. Human health is certainly a major concern; however, it seems incredible that we wait to react to an environmental problem until it becomes important to human health. Then all our energies and all the concern centers around protecting the

public from eating the fish rather than insuring better protection for our environment. The alternative approach we suggest would involve coordinated action at the federal level between those agencies that regulate and establish standards for pesticides and water quality as well as consumer food products. The Environmental Protection Agency was conceived as the means to coordinate these federal regulatory activities; however, apparently little progress has been made.

We need an expansion of the current water quality standards to adequately control persistent and potentially harmful materials. PCB's, DDT, mercury, and other harmful materials can go undetected in the water itself while they are being concentrated in fish at high levels. We need water quality standards related to sensitive, concentrating organisms like fish so that controls can be initiated before natural resource products are condemned. In cases like mercury, effluent standards may be the most appropriate control mechanism. For DDT, PCB's, and similar compounds, controls should be placed on the sale, use, and eventual disposal of the manufactured product.

To avoid future crises, the national clearing house recommended by Governor Milliken over a year ago needs to be established. This clearing house would review manufacturing processes, and the use and eventual disposal of manufactured products to determine what effect they may have on man and his environment. The creation of new products or manufacturing processes could be controlled immediately through such a clearing house, and we could at least begin the admittedly difficult task of evaluating existing products and manufacturing processes that may have contaminated our environment. Michigan has taken a giant step in the right direction in passing the recent "Truth in Pollution Bill". However, it is impractical to think that the states can do the whole job alone.

As the state agency charged with the responsibility of managing and protecting our fish and wildlife resources, the Department of Natural Resources cannot write off our Great Lakes fishery programs and many, if not most, of our inland fishery resources because of environmental contamination. Our Department and the public recognizes the fact that for the last 150 years we have been dumping all kinds of materials into our environment. We must also recognize nearly all of our fish and many of our wildlife resources now carry low levels of many compounds not found in our environment before western man arrived. We must concentrate our efforts at identifying and controlling all the environmental contaminants, particularly those that are persistent or potentially harmful while accepting the guidelines offered by our Public Health authorities on the consumption of wild fish and game.

As consumers, we can demand a high degree of purity in those food products grown in the controlled farm environment, because the producer can change his practices to remove the source of the contaminant. If a food product from the natural environment is involved, the individual producer has no control over the input of contaminants and he is forced to abide by a standard he cannot possibly meet. Following the present course, we could eventually end up condemning all our products from our natural environment and losing one of the strongest arguments we have for improving the quality of our environment.

Unfortunately, there is a tendency to forget about the problem of contamination once the consumer food products have been removed from the markets. We still have mercury, DDT, dieldrin, and PCB's in fish; and they are still a problem even though they can be removed from the commercial markets. Further research is needed to clarify the public health concerns. If the levels of contaminants found in fish are determined to be a serious public health hazard, more stringent warnings may be in order. If on the other hand, the risk is not as great as we now assume, we can utilize the millions of pounds of salmon which are now buried; and we need not close several species to commercial fishing.

Michigan has made significant progress in water pollution control. Our Great Lakes and tributary streams offer some of the highest quality of freshwater found anywhere in the world. Clear evidence supporting this contention is the fact that our Great Lakes and anadromous streams provided a sport catch of over 1.7 million trout and salmon and over 3.0 million days of recreation during 1970. The Great Lakes are not unique; most other watercourses in our country in or near populated areas have similar problems with PCB's, DDT, and/or mercury. The Great Lakes receives the publicity because we now have a valuable resource to protect--a decade ago Lake Michigan had no lake trout, no coho, no chinook, and few steelhead.

Our Department will continue to urge the development of our Great Lakes fishery resources so that we can retain the public incentive to clean up our environment while at the same time supplying a large part of our public's recreation demands.

PROGRESS IN POLLUTION CONTROL

Water quality data collected since the inception of the State's water quality monitoring program some nine years ago indicates a general improvement of water quality in Michigan streams as measured by the dissolved oxygen and suspended solids tests.

Phosphorus nutrient levels have remained about the same, however, a significant reduction will be made when communities complete facilities for phosphorus removal, the majority of which are scheduled for the end of 1972.

One of the most dramatic improvements in water quality has occurred in the Kalamazoo River below the City of Kalamazoo, Michigan. Past action by the Water Resources Commission has resulted in a major upgrading of municipal and industrial waste treatment in the Kalamazoo area. Improvement in river water quality became apparent with the start up of the City's new secondary biological waste treatment facilities designed to treat the municipal wastes and the major portion of the industrial wastes from the Kalamazoo area paper mills.

Studies conducted on the Kalamazoo River by staff of the Bureau of Water Management and Fisheries Division this past summer revealed significant populations of fish present where just a few short years ago, fish

life was essentially non-existent. These studies will form the basis for a critical review of present waste treatment and water quality conditions of the river by the Water Resources Commission with a view toward application of higher quality designated uses (i.e., from tolerant fish, warmwater species to intolerant fish, warmwater species).

Not only in the Kalamazoo area have efforts been expended to improve or enhance water quality. Fifteen other communities in the basin in addition to the City of Kalamazoo presently have programs underway to provide improved waste treatment.

Improvement of water quality in the Grand River basin has been evident and still further enhancement will be forthcoming in the near future. Sixteen communities in the past several years have either completed new treatment facilities or contracted with another community for treatment. Thirty-three more are either under construction or in the final stages of planning with construction expected to commence early in 1972.

Programs similar to those in the Grand and Kalamazoo River basins are being pursued throughout the state. Industries are facing the same requirements as the communities where they are located. Efforts are being expended to study and review areas where heavy metals or toxic discharges may occur with specific programs being established to prevent such discharges.

The new industrial waste treatment plant operator certificiation program, which includes routine monitoring and reporting of industrial waste treatment facilities operations, and the anticipated increased staff and monitoring capabilities made possible by the State's new waste surveillance fee program, will provide for more effective control over waste dischargers and more assurance of maintaining and further improving the quality of our lakes and streams.

RECREATION BOND FUND STATUS

In 1968 the people of the State of Michigan voted approval for establishment of a $100,000,000 Recreational Bond, of which $11,700,000 was subsequently approved for fisheries projects. All projects and expenditures require legislative approval. Accomplishments thus far and anticipated future accomplishments, all in the order of capital investments, were conceived to have long range affects and benefits for recreational fishing. Monies were made available for project work in fiscal year 1969.

Major categories of expenditure have been, and will continue to be, reflected in such areas as hatcheries, habitat development, land acquisition, and fish passage and lamprey barrier facilities and fisheries management supporting facilities.

With completion of the Platte River Anadromous Fish Hatchery, the first major project undertaken, Michigan can boast of having one of the foremost modern hatcheries in the country. Completion of this facility, which has a programmed capacity of 350,000 pounds of trout and salmon is

scheduled in 1973. Cost of the complete project will be approximately $6,000,000, of which nearly $3,000,000 has been supplied under the federal Anadromous Fish Act.

Engineering planning is presently in progress on a warmwater species hatchery in southeastern Michigan. Estimated cost of this facility, designed for 80,000 pounds of muskellunge, walleyes, and other warmwater species is $3,900,000.

Planning monies in the amount of $235,000 have been requested for a new trout hatchery for a programmed production of approximately 300,000 pounds. Anticipated cost of such a unit is $3,500,000. Also, a study of existing hatchery facilities is included to determine future direction, expansion potential, and determine effluent treatment needs to meet water quality standards.

Land acquisition under the Bonding Program is tailored to high intensity use areas, key watershed tracts, and special habitat areas. Funds, in the amount of $438,000, have been approved for the land purchases. Of primary importance this fiscal year is the purchase of access property on the Whitney Drain (AuGres River) at the former "Singing Bridge". This will accommodate many thousands of smelt dippers, and provide access to the Whitney Drain and Lake Huron.

Habitat development projects are starting this year with programmed construction of six northern pike spawning marshes. The allotment for these projects is $200,000, which involves low-head barrier structures and controlled flooding of 323 acres of prime spawning area. Production is estimated at 670,000 fingerlings.

Undoubtedly, funds will not provide for developing all six sites, so priorities have been set--Lake Cadillac, Wexford County, Center Lake, Jackson County; and Secord Lake, Gladwin County.

Fish passage facilities are mostly in the planning stage relative to fish ladders and lamprey barriers. Funds have been appropriated for removal of Homestead Dam on the Betsie River, Smyrna Dam on the Flat River, and final work at Newaygo. Such facilities and removal of barriers will allow for extended migration of anadromous fish species. Appropriations have amounted to $60,000 in planning money and $130,000 for dam removal.

Expenditures against the $11,700,000 Fisheries portion of the $40,000,000 provided for Department of Natural Resources projects breaks down as follows:

Platte River Hatchery	$5,700,000*
Warmwater Hatchery	1,200,000
Trout Hatchery Planning	235,000
Land Acquisition	438,000
Habitat Development	200,000
Passageway - Barriers	60,000
Dam Removal	130,000
Great Lakes Station - Lake St. Clair Planning	19,000
Dam Construction - Dollarville	250,000*
Otter Lake-Sturgeon River Diversion	133,000*
Sub-total	$8,365,000
*Federal Fund Deduct	2,549,000
Bond Fund Sub-total	$5,816,000

Continuation of staged construction and future projects are planned as follows:

Modernize Present Hatcheries	$1,000,000
Trout Hatchery	3,500,000
Warmwater Hatchery	3,000,000
Land Acquisition	200,000
Passageway - Barriers	1,200,000
Great Lakes Station - Lake St. Clair	100,000
Sub-total	$9,000,000
Federal Aid Deduct or General Fund	3,116,000
Bond Fund Sub-total	$5,884,000
TOTAL BOND FUND	$11,700,000
TOTAL OTHER MONIES	5,665,000
GRAND TOTAL	$17,365,000

These projects deplete Recreation Bond Funds except as they may be augmented by Federal Aid or General Fund monies.